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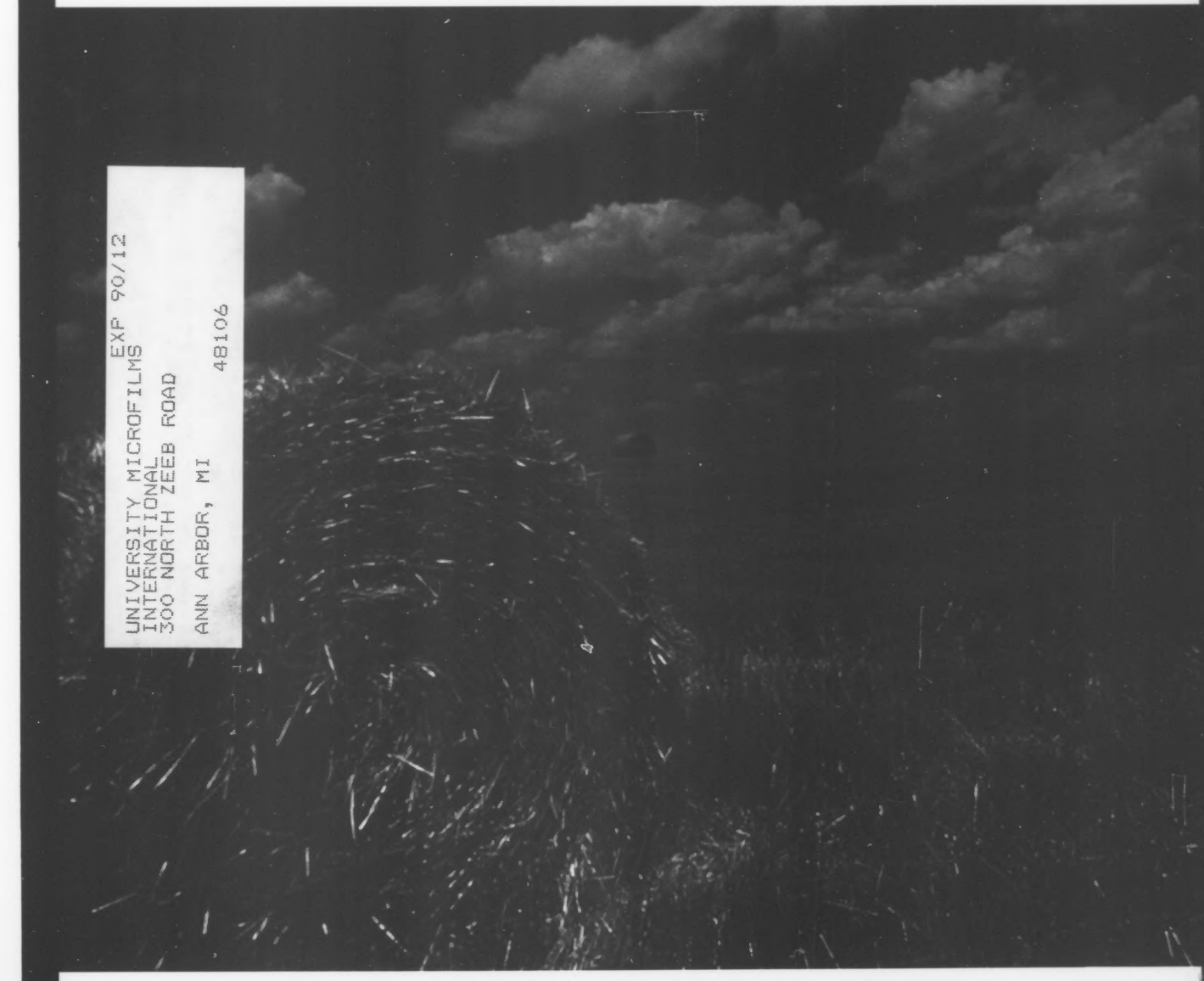

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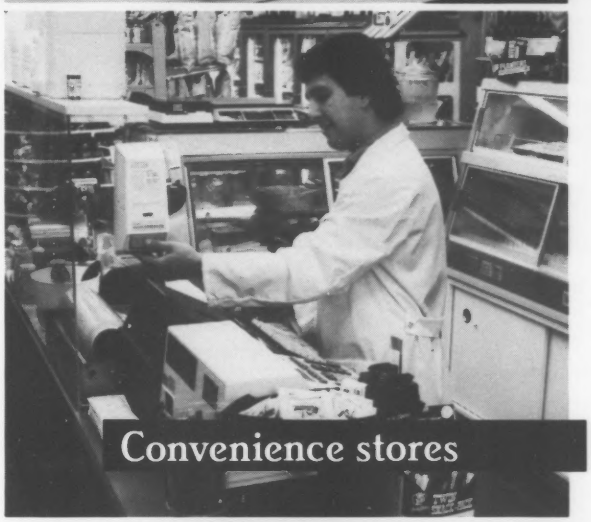

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Vol. 9 No. 11 NOVEMBER 1989

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Certification For Food Service Managers A Survey of Current Opinion

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ABSTRACT

The current opinion of state food protection directors toward certification was determined by a survey mailed to directors in each of the 50 states and the District of Columbia. There was a 96% return rate for the survey. Results of the survey reveal that 3 states (6%) have statewide mandatory certification programs; 17 states (35%) have voluntary programs, and 20 states (42%) have local jurisdictions with certification programs. A majority of directors (68%) would like to see either a mandatory or voluntary certification program in place in their state, and 73% of the respondents feel that certification programs do improve food handling practices. Barriers to developing statewide programs include financial resources, pragmatic design of training programs in rural states, and uniform requirements for certification. Respondents' comments are used to detail the implications of these barriers.

INTRODUCTION

In 1985, the Food and Drug Administration (FDA), in conjunction with the Educational Testing Service (ETS) began offering a certification exam for foodservice managers. The examination program is the culmination of an almost 15-year effort by the FDA to carry out recommendations made at the 1971 National Conference of Food Protection. Participants at that meeting decided that the focus of sanitation training, having long been directed at the food handler, should be moved to the foodservice manager. With the redirection of training efforts, they recommended that certification testing follow training (8). There are several arguments for certification.

1. The percentage of foodborne disease outbreaks attributed to foods consumed in a restaurant or foodservice establishment has grown from 39% between 1968 and 1976 (2) to 47% between 1980 and 1982 (3,4,5).
2. As funding is cut back, the efficacy of regular restaurant inspections is questioned (1,7,9). "The rapidity with which food service industry is expanding has not been matched with an increase in surveillance activities by health regulatory authorities due to cuts in operational budgets and consequent manpower and other limitations . . . Conditions could be enhanced for foodborne illnesses unless a more effective sanitation management system is introduced." (10)
3. It is a mark of professionalism to meet criteria determined by one's peers. Lawyers take the bar examination, doctors pass boards, and public accountants become Certified Public Accountants.
4. The process of certification raises professional esteem and expectations.

This paper reports the findings of a survey of food certification requirements at the state level done in the fall of 1987.

METHOD

While local jurisdictions generally have their own policies governing certification, a survey of perhaps 2000 regulatory districts was not feasible with the resources available. The survey determined the food protection directors' opinions about the adequacy of certification as a tool for improving food protection practices. Recertification practices were also studied.

The survey was sent to directors of food protection in each state and the District of Columbia. Therefore, 51 surveys were mailed; 49 were returned for an initial return rate of 96%.

The survey had four parts (Figure 1). Part one determined if there was a statewide certification program, either voluntary or mandatory. If so, part 3 asked about the means and length of certification, recertification, and reciprocity. If there was no state program, respondents were questioned

Figure 1
Survey on Certification of Food Service Managers

1. Does your state have a mandatory certification program for foodservice managers?
   Yes_____ No_____
2. Does your state have a voluntary certification program for foodservice managers?
   Yes_____ No_____
3. If there is not a certification program at the state level answer A-G. Otherwise, skip to question 4.
   A. Do local health jurisdictions in your state have certification programs?
      Yes_____ No_____
   B. What portion of your state do you estimate is served by jurisdictions with:
      a. mandatory certification programs _____0-25% _____25-50% _____>50%
      b. voluntary certification programs _____0-25% _____25-50% _____>50%
      c. no certification programs _____0-25% _____25-50% _____>50%
   C. I want a mandatory certification program in my state.
      Strongly agree_____ Agree_____ NA_____ Disagree _____ Strongly disagree _____
   D. I want a voluntary certification program in my state.
      Strongly agree_____ Agree_____ NA_____ Disagree _____ Strongly disagree _____
   E. Certification programs significantly improve food protection practices.
      Strongly agree_____ Agree_____ NA_____ Disagree _____ Strongly disagree _____
   F. Do you feel certification is best achieved by (check one):
      __attendance at a course?
      __taking an exam?
      __a course and an exam?
      __other; please describe _____
   G. Are you familiar with the Food Protection Certification Test, administered by the Educational Testing Service and endorsed by the FDA?
      Yes_____ No_____
      If yes, do you feel this program is an adequate measure of a foodservice manager's knowledge in food protection?
      Yes_____ No_____
4. If you have a certification program:
   A. Certification is determined by:
      __the Food Protection Certification Program exam, endorsed by the FDA
      __a different exam
      __a course alone
      __a course and an exam
      __other; please describe _____
   B. Who administers the certification means you use?

	the course	the exam
1) state agency	_____	_____
2) local health department?	_____	_____
3) local community college?	_____	_____
4) local university?	_____	_____
5) Educational Testing Service	_____	_____
6) Educational Foundation of the NRA	_____	_____
7) other _____	_____	_____

   C. How often must certification be renewed? _____
   D. How is certification renewed? _____
   E. Do you have certification reciprocity agreements with other states?
      Yes_____ No_____
   F. Do you have reciprocity based on the Food Protection Certification Program endorsed by the FDA and administered by Educational Testing Service?
      Yes_____ No_____
   G. Certification programs significantly improve food protection practices.
      Strongly agree_____ Agree_____ NA _____ Disagree _____Strongly disagree _____
   H. I am satisfied with my state's certification program.
      Strongly agree_____ Agree_____ NA _____ Disagree _____Strongly disagree _____
      If not, what would you change? _____
5. Please give any additional comment you have about the usefulness of food protection certification programs below.

on the percentage of population that might be served by local mandatory or voluntary certification programs. We also asked if they would like to see a program in place in their state and if they felt such programs were effective. Part 5 elicited the directors' opinions on the usefulness of food protection certification programs.

The survey had three minor weaknesses. The first two questions apparently did not make immediately clear that statewide programs were in question. Instead, they asked:
Does your state have a mandatory certification program for foodservice managers?
Does your state have a voluntary certification program forfoodservice managers?
The next question helped to clear any misunderstanding by beginning, "If there is not a certification program at the state level. . ."

When we designed the survey we did not anticipate that some states would have both voluntary programs at the state level and some mandatory local programs. Because this did occur, some respondents answered both parts 2 and part 3 of the survey which were intended to be mutually exclusive. When this did occur, data was coded for both parts.

Question 3B asked what portion of the population is served by mandatory, voluntary, or no certification programs. We directed the respondent to answer in the ranges of 0-25%, 25-50%, and greater than 50%. Reporting would have been easier had 0% and 100% been separate choices. Where it is possible to determine that no population or the entire population was served, however, that was the answer coded.

RESULTS

Seventeen states (35%) have statewide voluntary programs and 28 states (58%) have no statewide program. Twenty states (42%) reported local jurisdictions with certification programs.

While only 3 states have statewide mandatory certification programs, a total of 20 (42%) directors reported they would like to see a mandatory program in place in their state. This was determined from two questions on the survey. The first asked directors with no state level program if they wanted a mandatory certification program in their state (Table 1). The second asked directors what they would change about their current program. Five of the 17 respondents with voluntary programs already in place would prefer to have mandatory programs. None of those with mandatory programs said they would prefer a voluntary program; the only changes they suggested were in tightening the programs.

One respondent from a state with a voluntary program noted that "voluntary doesn't work." He did not suggest that the program become mandatory or be done away with, but we might assume he would prefer a mandatory program. Another director from a state with a voluntary program said he was dissatisfied with the program and would change it to a "statewide certification program." Since he reported one county in his state to have a mandatory program, we might assume that this director meant he would like to see a mandatory program in place. Making these assumptions, those desirous of a mandatory program becomes 22 (45.9%).

Only one of the directors wanting to change from a voluntary to a mandatory program gave any reasons for wanting to do so, and even his comments were contradictory. "[The] voluntary approach means you get the ones that need it the least and not getting (sic) the ones that need it the most. Training is needed and wanted - too much emphasis on certification and not enough on how to deliver and what to deliver - there are masses that need training - turnover is more of a problem than worrying about recertification." He also noted that while a mandatory program is desirable, "[the] need has not been documented." To support his position, he stated there were only 2 documented foodborne illness outbreaks in his state in 1986. Another state director without a statewide program, who responded that he would strongly agree to a mandatory program, sent a letter bemoaning the fact that in spite of two large salmonella outbreaks occurring simultaneously with the legislative debate, a proposal for statewide mandatory certification had been recently struck down.

Generally, those who did not want a mandatory program said so either because they would prefer a voluntary program or because they do not believe that certification programs are effective. Of the 14 who did not want a mandatory program in their state, 13 did want a voluntary program (Table 1). Of the same 14, 7 felt certification programs "significantly improve food protection practices"; 6 felt it did not and had no opinion. While overall, 35 (73%) of the respondents felt that certification programs did improve practices, there were some strong dissenting voices.

TABLE 1. Director's wanting mandatory versus voluntary statewide programs.

	I want a mandatory certification program in my state.				
I want a voluntary certification program in my state.	Strongly Agree	Agree	Don't know	Disagree	Strongly Disagree
Mandatory	8	8	4	13	1
Voluntary	5	13	7	6	2
Total	13	21	11	19	3

TABLE 2. Certification programs significantly improve food protection practices.

Strongly Agree	Agree	Don't know	Disagree	Strongly Disagree
8	27	3	7	0

The respondent who strongly rejected the idea of a mandatory program noted that in his state they had tried different training programs over the years with little success. Managers did not seem to be motivated to put good practices into effect, and until motivation exists, any certification program will fail to change practices. Another respondent agreed. "I don't feel our current teaching methods are resulting in many corrective actions taken by managers. I feel they know the answers but they (the managers) are not following through." A director from a state that recently decided to keep their voluntary program from becoming mandatory, noted that "education of the industry personnel has the potential for improving food protection practices in the industry but is no guarantee that improvement will happen. The education provided not only must inform the students about the prevention of foodborne illness, but must convince them that it is important for operating their business. Until the industry wants to practice safe food handling techniques, education will not do much to improve the current situation." Noting the same problem of motivation, another respondent said that reinforcement through on-site education by inspectors would improve the effectiveness of certification programs, and that subsequent inspections have to follow-up on what was taught. Another suggestion for motivating managers and making certification programs more credible is to include decertification, retraining, and retesting as part of the program.

Motivation is a problem. Many texts on restaurant management will quote good sanitation as being appealing to customers and note the potential fallout from lawsuits when contaminated food is served and an outbreak of foodborne disease is the result. In research on the economic losses from foodborne diseases resulting from food service establishments, Todd found that the cost to the restaurant for business lost ranged from $10,000 to $228,000 (8). The problem is that many foodborne illnesses go unreported and cannot be attributed to a specific eating establishment. Hauschild and Bryan (6) reported that the median ratio of estimated cases of foodborne diseases to initially reported cases was 25:1. Therefore, the odds of a restaurant manager being 'caught' in serving unsafe foods is unnaturally low. This obviously limits the motivation for learning and implementing the details of safe food handling practices.

One director, with no opinion about a certification program in his state, suggested someone study the effectiveness of certification programs. "Such programs [certification programs] are not proven ones - greatest need is a scientific study (studies) that would demonstrate that knowledge of food protection either lowers the incidence of foodborne infections or raises sanitation levels. [We] cannot justify time and costs of such programs without such information." Only one respondent did not want either a mandatory or voluntary program. He gave no reason for his opinion.

Respondents often mentioned money as a deterrent for certification programs. From the simple comment "need time and money!" we can gather that budgets are tight and certification programs are burdensome. In their comments, five states noted funding to be a problem. Illinois is hoping to add fee-based certification to reduce the costliness of its mandatory program. In some states, the state restaurant association is a partner in certification programs. The voluntary program established in 1987 in Tennessee is jointly sponsored by the state and the Tennessee Restaurant Association. In Indiana, the Indiana Restaurant Association and local community colleges administer the certification programs.

The ruralism of a state affected its outlook on certification. Arkansas reported that "due to current politics, economics, and a predominantly rural state, a coordinated state program is not foreseen in the near future." The director from Wyoming explained that he has only 6 counties with local health programs. The state inspector is responsible for the other two-thirds of the state. "Sparse population and distances between towns would lend major problems with mandatory certification." He added that there is no state restaurant association. It was not clear why this is important. It is possible that the lack of a state restaurant association denies them of a partner in conducting a certification program or that relationships with restaurant managers are easier without an organized opposition. These same conditions of rurality create special problems for Alaska. The director there observed that there would need to be correspondence courses and exams offered as an option to attended ones.

Local Programs

We did not survey local jurisdictions directly, but we did ask state directors if there were mandatory or voluntary certification programs at the local level and what portion of the population was served by jurisdictions with these programs. Twenty states reported local jurisdictions with mandatory or voluntary programs. Table 3 shows the number of respondents reporting populations covered by mandatory, voluntary, and no certification programs. Note that only 16 states (33.33%) report no active certification programs. Two states claiming to have statewide voluntary certification programs reported that only 25% of the state's population may be covered by these programs.

TABLE 3. Percent of Population in Each State Covered by the Different Programs.

	0%	1-25%	26-50%	51-99%	100%	missing or not recorded
Mandatory	19	15	1	0	3	10
Voluntary	21	10	1	5	2	9
No program	8	1	1	10	16	12

The respondents were very generous in sharing information about the local jurisdictions and their programs. Their comments on these are worth noting. First, there is disagreement among some of the states as to who should be trained and certified. Arizona has several county health departments which offer a food handling course required for all foodservice employees. The state director noted that "with the great turnover in the food industry it would be more effective to train/certify mangers, and they in turn the staff." The respondent for Idaho however, stated that "training and certification should be for all levels of employee; not just the manager - to be effective." San Diego County in California and some local health departments in Utah have requirements for training and/or permits for food handlers. In San Diego, managers are certified permanently, but handlers have to be recertified every 3 years. Illinois is seeking to strengthen its mandatory program for managers by adding a parallel program for food handlers.

Washington reported that the most successful of its local programs refunds 60% of the food establishment license fee when certified managers are present on all shifts and inspection scores are less than 20 demerits. This provides incentive for certification and incentive to practice the newly acquired knowledge. Illinois is planning to strengthen its program by adding a requirement for at least one certified supervisor present on each shift.

The Certification Programs

Where no statewide program existed, we asked respondents what they felt was the best way to achieve certification. A course and exam was the preferred method, with 86% choosing it. Only one state thought course alone was sufficient; however, this state representative added that continuing education, presumably as part of inspections, was an effective method of training as well. The respondent for Missouri felt that "if a person's training and experience allows them to pass satisfactorily a recognized test such as ETS, a training course is not necessary." Another respondent suggested a field component was important to any certification effort.

Among the 18 states that do have certification programs, 11 (61%) use the course/exam method. Six of these respondents specified the NIFI course (now the Educational Foundation of the NRA) as the one they use. Eight (44.4%) offer the ETS examination; two offer only a course. In Michigan, certification is achieved through the NIFI program and a state exam on state requirements. Nebraska checked the 'other' box and added that they send a slide/script program with their test upon request. Seventeen of the 18 states with programs responded to the questions about the administration of the courses and examinations used in certification (Table 4). Note that one state identified ETS as administering a course. This is incorrect since, of course, ETS only administers the test.

Local community colleges are most frequently involved with training, less frequently with testing. Apparently there was some confusion over the term 'administer'. From the answers we could not clearly determine if the courses were really not followed by an examination through which certification could be achieved or whether the examination offered originated through the state or local agency.

TABLE 4. Who Administers the Courses and Exams.

	Course	Exam
State Agency	7	7
Local Health Department	7	5
Local Community College	10	5
Local University	5	2
ETS	1	7
Education Foundation of the NRA	2	4
Other:	6	3
	(2) Private industry Indiana Restaurant Assoc. Vocational Schools IEHA City of Chicago	Private industry Indiana Restaurant Assoc. City of Chicago

Most states have not addressed certification renewal. Only 3 of the 17 states with certification programs have a specified certification period. Nebraska seeks annual recertification in its voluntary program; the mandatory programs include provisions for no renewal, three year renewal, and 5 year renewal. Four voluntary programs have provisions for recertification, usually retaking the course/examination. Illinois has a 5 year certification period. To renew, the candidate simply fills out an application and waits for approval. This process is now under review.

In spite of the FDA's efforts to encourage agreements for reciprocity, there are few reciprocal agreements evidenced in this survey. However, one has to remember that local jurisdictions were not covered by the survey and that they may have their own agreements with each other. Only four states affirmed reciprocity agreements. However, when asked specifically if they had reciprocity based on the ETS examination, four others answered yes. Therefore, the total number of states participating in reciprocity is 8 (44.4%). Seven of these recognize the ETS examination. Two, Illinois and Ohio, will recognize the certificate from ETS only when the candidate has documented proof of attendance at a training course.

The respondent from Illinois generously shared more information about that state's program, and some of the points are important for our consideration and unique to Illinois. They are seeking several changes to the current program. First, they want to develop standards of sponsorship for instructors to discourage 'freelance' instructors. Second, they are examining approval and evaluation guidelines for instructor and course content. By placing stricter controls on who teaches and what is taught, they can be sure that knowledge presented in the class is geared toward relevant food protection practices.

CONCLUSIONS

Although their effectiveness has not been scientifically proven, we believe that certification programs do have a positive effect on safe food handling practices, and would argue that if nothing else, by lending a vestige of professionalism to the restaurant manager, certification can improve food safety. The survey revealed that state directors responsible for retail food safety find certification programs attractive and desirable, and realize they are not a miracle cure. Real problems with certification include motivating managers and food handlers to change their practices once training and certification have been received; finding the financial resources for the programs; determining a pragmatic way to conduct the programs in rural states; locating qualified teachers for the educational component; and making knowledge achieved for certification in one state carry over to the next. States are working through these problems and are moving toward statewide certification programs. We believe that certification is an important prerequisite for safe food in our restaurants. By at least requiring the manager to be initially trained and tested in food protection and sanitation, the environmental health specialist and the manager can work from a common base of knowledge and understanding of what is expected. By certifying the manager as early in his education as possible, we can develop a pool of managers who are providing the consumer with a safer meal. Today there is a significant risk of foodborne disease that does not have to exist.

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THERMOPHILIC ANAEROBIC TREATMENT OF A WHEAT STARCH PROCESSING WASTEWATER: A FULL SCALE CASE HISTORY

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ABSTRACT

Ogilvie Mills operates three wheat starch processing facilities in North America: Thunder Bay, Ontario; Candiac, Quebec; and Keokuk, Iowa. All three of these facilities pretreat their wastewater, which is high in both COD (Chemical Oxygen Demand) and TSS (Total Suspended Solids), by the thermophilic anaerobic chemostat process. This unique anaerobic treatment method is being utilized at Keokuk and Candiac because of its proven success at Thunder Bay.

This paper will describe the case histories of each full-scale installation including a summary of the benchscale and pilot plant studies that led to the development of these cost effective and energy self-sufficient systems.

Included is a review of the design parameters, operating performance, biogas recovery, manpower requirements and operating costs.

BACKGROUND

In 1981, Ogilvie Mills Ltd. (formerly Industrial Grain Products, Ltd.) of Thunder Bay, Ontario, Canada was issued a control order by the Ministry of Environment (MOE) to treat their effluent prior to discharge. The new order placed a limit of 900 kg per day on BOD_5 (Biological Oxygen Demand) that could be discharged from the factory.[1]

After reviewing several alternative technologies, Ogilvie Mills selected anaerobic treatment for the following reasons:

- Wheat starch effluent is high in organic strength (16,000-20,000 mg/l COD) which usually indicates a high potential for anaerobic treatability.
- Starch and wheat starch effluents have typically been difficult and expensive to treat aerobically.
- A high percentage of the organics in the wastewater could be converted to biogas, a valuable by-product.
- A small percentage of the wastewater is converted to biomass in anaerobic systems, minimizing or eliminating sludge disposal costs.
- Minimal electrical requirements. Operating horsepower is typically low because little or no aeration is required.

Although anaerobic treatment provides many substantial advantages, it also exhibits liabilities.

- Anaerobic bacteria have strict environmental requirements.
- Odor from anaerobic systems may become a nuisance. Hydrogen sulfide and other volatile compounds are almost always present.
- Anaerobic systems can be sensitive to cleaning agents containing biocides, chlorine, and other toxic compounds.

After deciding on anaerobic treatment as the most suitable technology to be used for achieving compliance, the upflow anaerobic sludge blanket (UASB) process was piloted. The result from this study indicated that stable operation could not be achieved because of excessive biomass loss in the effluent. This appeared to have resulted from the high levels of TSS in the influent waste stream. Therefore, it was concluded that as the sludge blanket could not be maintained, USAB technology was not applicable for the treatment of Ogilvie's wastewater.

Ogilvie then decided to investigate the anaerobic contact approach and contacted Purac Engineering, Inc. (formerly AC Biotechnics) because of previous experience in the treatment of wheat starch wastewater. A brief pilot study conducted at a wheat starch factory in West Germany had yielded promising results. Due to increasing regulatory pressure from the MOE, Ogilvie was forced to immediately proceed with full-scale design. Purac, with a limited amount of experience in wheat starch effluent treatment, was chosen as the turn-key supplier of the system.[2]

ORIGINAL DESIGN AND COMMISSIONING OF THE MESOPHILIC SYSTEM

The anaerobic system at Thunder Bay was originally designed to be operated in the mesophilic temperature range (~36°C). The influent characterization is listed in Table 1.

TABLE 1
CHARACTERIZATION OF WHEAT STARCH EFFLUENT FOR DESIGN
Ogilvie Mills, Thunder Bay, Ontario

Parameter*	Average	Range
Flow	-[1]	-[1]
Total BOD_5	8,236	5,000-9,884
Total COD	14,250	8,000-17,100
TKN	385	350-450
Ortho P	70	50-80
Chlorides	1,496	1,450-1,510
pH		4.1-5.5

*Units of all parameters are mg/l, except pH.
[1]Confidential information.

The anaerobic contact reactor consisted of a completely mixed steel tank. The overflow from the anaerobic tank enters the flocculation/degasification tank which served two major functions. First to degasify the sludge which reduced the possibility of flotation in a lamella clarifier, and secondly, to form a quiescent/pre-flocculation zone prior to the inclined plate clarifier or lamella. The lamella was chosen over conventional type settlers for a number of reasons:

- Limited land availability. (Lamellas occupy little space when compared to conventional clarifiers.)
- Odor considerations (Lamellas have a much reduced exposed surface area when compared to conventional clarifiers of equivalent settling area. This exposed area can be easily covered, minimizing odor generation.)
- Since influent heating was required, heat loss reduction was a consideration. (The external surface area to settling surface ratio is low in lamellas. This was an important consideration given the plant's location in Canada.)
- A short hydraulic retention time reduces the occurrence of sludge regasification.

The effluent from the lamella overflowed to an activated sludge system which included a final clarifier. This aerobic post-treatment stage was integrated into the full scale system to insure that the effluent met the government requirements.

In 1982, the system was completed and ready for commissioning. The anaerobic seed was obtained from a municipal digester in Thunder Bay. Initially, the system performed well, but as the influent flow was slowly increased over several weeks, the stability of the system deteriorated for the following reasons:

- The sludge demonstrated occasional poor settling characteristics, and therefore, biomass was lost in the effluent. The digester was never able to achieve design biomass concentrations.
- Without sufficient biomass in the anaerobic tank, high F/M (Food to Mass based on chemical oxygen demand volatile suspended solids) ratios resulted, leading to system failure as indicated by the following biological parameters: decreased pH, high VFA (Volatile Fatty Acids) = 1,500-2,000 mg/l, and low methane yields.

After five months of operation, it became quite evident that the facility would not function at its designed loading level of 2.6 kg COD/m^3/d without system modifications and/or process changes.

RESEARCH AND DEVELOPMENT PROGRAM

Purac Engineering, Inc. initiated an intensive program to research and develop methods that would improve the system's performance. The results from the program are summarized as follows:

Micronutrient Additions

It has been well documented that certain trace metals are required by the methane forming bacteria to convert the end products of acetogenesis and dehydrogenation to methane and carbon dioxide. (3)(4) The wastewater at Ogilvie Mills was found to be deficient of micronutrients, as are many other industrial wastewater streams.

The addition of micronutrients to the mesophilic system had an immediate positive effect on the biological stability of the system. Loadings were increased from 0.5 kg COD/m^3/d to 1.7 kg COD/m^3/d. The biogas quality and settling characteristics of the sludge also improved substantially. Unfortunately, at loadings greater than 1.7 kg COD/m^3/d, the system again exhibited signs of biological instability, and more research was required.

Hydrolysis

Concurrently with the full-scale micronutrient testing taking place at Thunder Bay, a pilot-scale study was initiated at another Ogilvie factory to test the effect of a

hydrolysis stage before the mesophilic anaerobic stage. The wastewater at each factory was similar. The results from the pilot were as follows:

- Without a hydrolysis stage, loadings up to 1.5 kg COD/m^3/d could be achieved with stable operation.
- A hydrolysis stage prior to the anaerobic stage (maintained at a pH of 5.5 by the recirculation of anaerobic solids) did significantly solubilize particulate COD. The maximum loading that could be achieved with stable operation was 2.0 kg COD/m^3/d.
- Micronutrients were required for biological stability.
- Solubilization of influent particulate matter does slightly improve the system's ability to biodegrade wheat starch waste. However, this improved performance would not allow the full-scale system to achieve its design loading levels.

Centrifugation

Centrifugation was also tested as an alternative to lamella separation. Decanter type centrifuges did yield acceptable results, but many expensive units were required for full-scale solids recirculation. Also, the system had high electrical requirements and required $500 of polymer per day. Therefore, centrifugation was an uneconomical solution to the problem of managing the biosolids.

Thermophilic Research and Development

A benchscale program was initiated to research the anaerobic treatability of wheat starch effluent at thermophilic temperatures. Table 2 gives a brief overview of the benchscale trial and its results.

The benchscale thermophilic test with micronutrient Mix B resulted in biological stability at loadings up to 4.0 kg COD/m^3/d without added buffering capacity. Biogas yields averaged 0.26 m^3CH_4/kg COD added.

Pre-hydrolysis and influent solids removal prior to treatment indicated no substantial improvement in performance. It is important to note that the micronutrients required for the mesophilic system also proved to be required for biological stability in the thermophilic system.

Due to the promising results of the benchscale testing, an on-site 10 m^3 pilot program was initiated to further research the possibility of changing the full-scale operation over to a thermophilic system. The conclusions from the pilot study are as listed in Table 3.

FULL-SCALE MODIFICATIONS

The results from the research and development program initiated Purac to implement the following full-scale modifications.

TABLE 2
THERMOPHILIC BENCHSCALE TEST

Configuration	Result
• Thermophilic without micronutrients	Biological instability
• Thermophilic with micronutrient Mix A	Biological instability
• Thermophilic with micronutrient Mix B	Stable Operation - Loadings of 4.0 kg COD/m^3/d achieved
• Thermophilis with micronutrient Mix B and Pre-hydrolysis	As Above - No Significant Improvement
• Thermophilic with micronutrient Mix B, Prehydrolysis, and Influent Suspended Solids Removal Prior to Treatment	As Above- No Significant Improvement

Table 3
THERMOPHILIC PILOT TEST CONCLUSIONS

- The pilot system could operate at loadings up to 4.0 kg COD/m^3/d while maintaining stability.
- BOD reductions were high enough to achieve compliance with the new government regulations.
- Micronutrients were required for stability.
- A significant portion of the COD was converted into methane (~0.26 m^3CH_4/kg COD added).
- Odors were notably worse than in previous mesophilic experiences.
- Biogas entrainment was causing sludge flotation in the lamella settler.

Thermophilic and Chemostat Conversions

In August of 1985, the mesophilic system was converted to thermophilic, and by October, full flow was achieved. The performance results are as follows: COD and BOD reductions of 75% and 85-92% respectively (anaerobic stage only), low VFA's, F/M's (COD/VSS) of 1.0-2.2 and loadings of 3.0-4.9 kg COD/m^3/d were experienced with biological stability. As full flow was achieved, odor problems quickly became a major concern due to complaints from nearby neighbors. The Ministry of Environment ordered Ogilvie Mills to reduce the flow to the anaerobic facility until a solution to the odor problem was reached.

The lamella and degasification/flocculation tank, which both have surfaces exposed to the open atmosphere, were the source of the odor emissions. As the full-scale thermophilic facility continued to operate, the same sludge handling problems experienced during the pilot study surfaced. Biogas entrainment within the sludge was causing

the biomass to float on the lamella surface, frequently resulting in effluent TSS concentrations greater than the recirculation sludge concentrations. Even with the removal of the biogas from the sludge within the degasification tank, the bacteria quickly regasified upon entering the lamella. This is due to the high metabolic activity rates associated with the thermophilic bacteria. Because of the poor settling characteristics demonstrated by the sludge, the lamella and floc/degas tank could not function as originally designed to recirculate the biomass back to the anaerobic reactor. Nevertheless, it was also quite apparent that the anaerobic system was functioning extremely well at high F/M ratios, and therefore, no biomass recirculation was needed. The effluent from the anaerobic tank was bypassed around the lamella and floc/degas tank and piped directly into the activated sludge basin. The modification above solved the odor problems and full flow to the plant was resumed with the required treatment performance being achieved.

Because of proven success at Thunder Bay, the thermophilic anaerobic chemostat process has been specifically adapted for each of Ogilvie's North American wheat starch processing factories.

FULL-SCALE DESIGN AND OPERATION

The thermophilic anaerobic facilities at Thunder Bay, Keokuk, and Candiac are all similar in process design (Figure 1) except Keokuk does not use aerobic polishing. Each of the factories effluent streams are made up of similar organic constituents with the principal difference being concentration. This is primarily due to the fact that each mill's wheat starch/gluten processing method is different. Specialized modifications of Ogilvie's wheat starch products also significantly influence the wastewater concentrations at each factory. The wastewaters produced at Thunder Bay and Keokuk are similar in organic strength. At Candiac, the effluent is substantially more concentrated in COD and BOD. Table 4 represents each factory's design effluent characterization.

Basic Design

Thunder Bay. The wheat starch processing wastewater at Ogilvie Mills in Thunder Bay leaves the factory at approximately 35°C. The anaerobic influent stream is adjusted to thermophilic temperatures by adding waste flash steam from the starch dryers and final temperature adjustment to 55°C is performed by direct steam injection. Flow enters the completely mixed anaerobic tank where waste stabilization occurs. Biogas collected in the tank dome is compressed and piped to the factory boiler where it is burned.

The effluent from the anaerobic tank overflows into a pump tank (flow equalization tank) and then through a heat exchanger, where it undergoes a countercurrent heat transfer with the production plant's cold process water supply. This reduces and sometimes eliminates heating of the raw water for production purposes. Heat recovery from the effluent essentially equals the heat added to the influent, therefore, the cost of heating the wastewater is minimal. Effluent from the thermophilic system must be cooled prior to aerobic treatment due to oxygen solubility and biological considerations. The effluent from the activated sludge basin is clarified and discharged directly to the river.

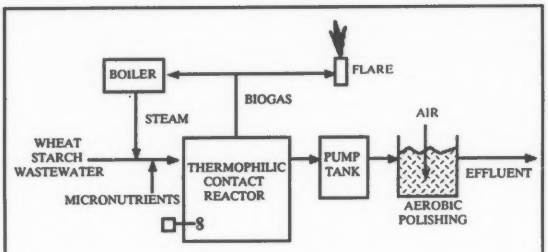

Figure 1. Flow Schematic of a Thermophilic Contact System

Ogilvie Mills, Keokuk, Iowa. The design effluent characterization for Ogilvie Mills at Keokuk is presented in Table 4. The wastewater flows from the factory (temperature 35°C) and enters a spiral heat exchanger whereby it undergoes a countercurrent heat exchange with the anaerobic effluent. The heat recovered from the effluent increases the temperature of the influent by 6°C. The final temperature adjustment is carried out by direct steam injection. From here, the influent enters an anaerobic tank, completely mixed by 2 side mounted 25 Hp mixers (3 installed/1 stand-by).

Table 4
DESIGN EFFLUENT CHARACTERIZATION

Ogilvie Mills Factory	Influent Design Parameters* Flow m^3/d	BOD_5 (mg/l)	COD (mg/l)	pH	Design Loadings* $KgCOD/m^3/d$
Thunder Bay, Ontario	-[1]	8,240	14,250	4.8	2.6
Keokuk, Iowa	-[1]	9,500	15,150	4.0	2.7
Candiac, Que.	-[1]	16,400	26,800	4.7	4.0

*Average Design Parameters, Not Maximum.
[1]Confidential Information.

The biogas is collected in the anaerobic tank dome and compressed and burned in a small steam generating boiler (normally operating only on biogas). At approximately one half of design organic loading, the steam generated from the biogas recovery not only supplies the energy for maintaining the proper temperature in the anaerobic tank, but also supplies the factory with approximately 1500 pounds of steam per hour.

A substantial amount of biogas is being flared and not utilized in the boiler due to variations in gas production which conflict with stable boiler operation. The boiler rate has been reduced to allow for the flow variations while receiving a consistent supply of gas. Unfortunately, the reasons for the oscillations in biogas flow are not completely understood. Due to the extremely high reaction rates of thermophilic bacteria, it is suspected that minor variations in the characterization of the influent stream (such as pH, COD/BOD, TSS, cleaning agents, biocides,etc.) could have an immediate influence on the gas production rate.

The treated effluent overflows from the anaerobic digester and enters a flow equalization tank. The effluent is pumped through the spiral heat exchanger for heat transfer to the influent stream and is finally discharged to the city sewer.

Ogilvie Mills Ltd., Candiac, Montreal. The design effluent characterization is presented in Table 4. The significantly different characteristics of Candiac's wastewater, initiated yet another thermophilic chemostat pilot study (5 m^3) for full-scale design. The conclusions of this study are listed in Table 5.

Due to the conclusions drawn from Phase I of the pilot study, Phase II was initiated to research alternative system modifications that would allow Ogilvie to comply with the MOE regulations. The results from the modifications tested are presented in Table 6.

The resulting information from Phase I and Phase II of the pilot study, along with previous pilot and full-scale experience, allowed Purac Engineering, Inc. to design the wastewater treatment plant at Candiac with the following configurations. The processing wastewater from the production process first undergoes a countercurrent heat exchange with the anaerobic effluent that has been previously cooled to ≤ 49°C. (NOTE: This prevents rapid fouling of the heat exchanger due to "cooking" of the starch contained in the influent.) The final temperature adjustment for the influent stream is completed by direct steam injection. The wastewater now enters the anaerobic tank, completely mixed by 2 side mounted 25 Hp mixers (3 installed/1 stand-by). The anaerobic effluent overflows from the digester into an equalization tank. The treated water is pumped through the first heat exchanger to preheat Ogilvie's cold process water. The effluent then enters another heat exchanger (at a temperature ≤ 49°C) for preheating the influent stream prior to steam injection. The effluent is post-treated in an aerobic sludge basin (one day HRT) before being finally discharged to a municipal waste treatment facility. The anaerobic plant at Candiac has been engineered for future installation of biogas handling equipment. At present, the biogas is being burned in a flare.

Table 5
Ogilvie Mills, Candiac
Chemostat Pilot Plant Conclusions - Phase I

- Organic loadings of 4.1 kg COD/m^3/d could be achieved with biological stability.
- A minimum Hydraulic Retention Time (HRT)/Solids Retention Time (SRT) of 5.5 days was required. (In a contact chemostat process the HRT is essentially equal to SRT)
- Micronutrients were required for stability.
- Methane yields of 0.23 m^3CH_4/kg COD added were slightly lower than previously achieved during the pilot study at Thunder Bay. Nevertheless, greater than two-thirds of the organic waste was converted into methane.
- BOD_5 and TSS reductions were 80% and 37%, respectively.
- Treating the concentrated wastewater by the thermophilic chemostat process alone would not allow Ogilvie to comply with the Quebec Ministry of Environment's (MOE) regulations.
- More research was required for full-scale design.

Table 6
Ogilvie Mills, Candiac
Chemostat Pilot Plant Conclusions - Phase II

Configuration in Addition to the Anaerobic Chemostat Stage	Result
Hydrolysis Pre-treatment	Minimal effect on overall performance
Increasing Anaerobic HRT beyond 6.25 days	Negative effect on solids reductions due to greater accumulation of biomass in the system
Anaerobic Post-treatment (3 day HRT)	Ineffective in reducing overall effluent BOD and TSS concentrations
Aerobic Post-treatment (1 day HRT)	Would allow system to sufficiently meet BOD_5 discharge limits. TSS limits could be met with less of a margin.
Aerobic Post-treatment (2 day HRT)	No significant improvement over the above.

Performance Results

The actual influent characterizations and performance results from each thermophilic anaerobic treatment facility are presented in Table 7.

Biogas Recovery

In the full-scale thermophilic anaerobic treatment of wheat starch processing waste, COD to methane conver-

Table 7
PERFORMANCE REVIEW
FULL-SCALE THERMOPHILIC ANAEROBIC CONTACT FACILITIES

Ogilvie Mills Factory Location	Start-up Date	Actual Influent Parameters Flow (m^3/d)	BOD_5 (mg/l)	COD (mg/l)	TSS mg/l	Reactor Loading Rate $KgCOD/m^3/d$	Reductions (Anaerobic only) COD %	BOD %
Thunder Bay, Ontario	1982	-[1]	11,000	15,900	5248	3.2	81	93
Keokuk, Iowa	1987	-[1]	9,000	20,000	2757	1.5	82	97
Candiac, Quebec	1989[2]	-[1]	16,500	26,800	5200	4.0[3]	69[3]	83[3]

[1]Confidential Information.
[2]Presently Commissioning.
[3]Expected Values.

Table 8
NORMAL OPERATING COSTS

Ogilvie Mills Factory	Operating Horsepower (Anaerobic Only)	Chemical Costs U.S. $/Day Nitrogen	Phosphorus	Micro-Nutrients	Caustic	Manpower Hrs/wk*
Thunder Bay, Ontario	105[1]	0	0	13	260	34
Keokuk, Iowa	175[2]	0	0	15	0	35
Candiac, Quebec	80	0	0	50[3]	0	<40[3]

*Operations, analytical, and routine maintenance.
[1]Including biogas compressor.
[2]Including boiler and biogas compressor.
[3]Expected Value.

sion rates are approximately 0.25 m^3 CH_4 per kg of COD added. The BTU's recovered from burning the biogas will not only provide a cost-free fuel source for maintaining a thermophilic environment, but also will provide excess energy to be used in other production areas in the factory.

Operating Cost Centers

Table 8 exhibits the operating cost centers for each thermophilic anaerobic treatment plant. Simply stated, each facility operates under the most economically favorable conditions. Minimal costs are incurred for electrical, chemical, and manpower requirements. Note that the caustic utilization at Thunder Bay is primarily the result of average anaerobic loadings (kg $COD/m^3/d$) at 20% above design levels.

CONCLUSIONS

Traditionally, starch and wheat starch effluents have been difficult and costly to biologically stabilize. Many years of research have led to the development of the thermophilic anaerobic chemostat process. This specialized anaerobic treatment method has proven to be an excellent means of cost effectively treating concentrated wheat starch effluent.

Thermophilic vs. Mesophilic

Thermophilic anaerobic technology has been utilized in only a few full-scale applications. Besides the three facilities built in North America for Ogilvie Mills, the author only knows of three others that have been constructed. One at an alcohol distillery in Carrion, Spain, and the two others at dissolving sulfite pulp mills in Gotsu and Akita, Japan.

The successful thermophilic technology developed for the wheat starch industry could prove to be applicable in the treatment of many other concentrated and complex waste streams. Thermophilic treatment has proven to offer many substantial advantages over the traditionally utilized mesophilic technology.

1. At thermophilic temperatures, the increased metabolic rate of anaerobic bacteria allow a system to operate at much higher food to mass ratios.
2. Because of the higher rate of biological degradation at thermophilic temperatures, neutralization is normally not required under design and peak loading conditions. Several other contact and USAB mesophilic systems in North America treating starch based waste have required a substantial amount of caustic to maintain pH.
3. Thermophilic systems are capable of higher loading rates

than mesophilic systems. This has resulted in reduced capital investments for full-scale construction.

4. The bioconversion of wheat starch waste to methane is close to theoretical values. The burning of the recovered biogas will provide the energy for the thermophilic environment and also excess energy for production purposes.
5. Thermophilic anaerobic treatment systems have demonstrated extremely stable biological treatment. High loading variations or prolonged shut downs typically have not caused problems.

Thermophilic anaerobic treatment not only offers advantages, but also offers an alternative method of bioconverting waste organics into methane gas. In cases where mesophilic does not yield the desired biological stability and/or cost effective results, thermophilic technology should be investigated.

Future Development

The current goal of process development for thermophilic anaerobic chemostat process is to incorporate biosolids management and recycle into the system's design. This will allow the potential to increase the treatment performance and capacity of existing systems and reduce capital costs of future systems. Several different technologies and methods are being investigated, including vacuum degasification, polymer and coagulants combined with gravity sedimentation, and dissolved air flotation (DAF).

Internal pilot experimentation has indicated that DAF can be successfully utilized to separate biosolids in mesophilic anaerobic systems. DAF alone and with polymers/coagulants have both yielded recycle biosolids concentrations up to 5%. TSS removals from the anaerobic effluent ranged from 85-90%. The potential problem of significant biological inhibition due to oxygen toxicity has not been noted. At this time, DAF seems to be the most attractive technology for improving the performance and cost effectiveness of the thermophilic anaerobic chemostat process.

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Developing A Successful Enforcement Program

By

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If you are a regulatory person responsible for enforcement of a public health code, an industry representative enforcing company control procedures, or from academia enforcing university policies, then this article is for you. Everyone who is responsible for enforcement activities have an ongoing challenge to ensure their program is as effective and efficient as possible.

Perhaps a better title for this article should be "Enforcement - A Matter of Philosophy." For example, who in your organization is the most important for ensuring high standards? If you didn't think of the highest ranking officer in your organization, then you have a surprise to come.

Whether you work for business, industry, government, or academia, senior management (appointed or elected) sets the standards for your organization. This is particularly true for enforcement programs. Since enforcement programs generally connote things like: non-compliance, confrontation, aggressive behavior, detail orientation, lawsuits, etc., it is essential that support for enforcement programs is well routed at the top of the organization. If it is not, no matter what you do to enhance your enforcement program, success will be limited.

A significant partner in establishing your enforcement program is the consumer. He or she sets the standards for a product or service and then expects you to ensure its satisfactory delivery. Often working in conjunction with the consumer is the news media. Examples of how business, industry, and government have failed in their enforcement programs have been demonstrated in the television and print media on many occasions.

No failure is more dramatic than when industry fails to set and maintain its standards or when government fails to enforce laws and regulations to protect the public's health. There is absolutely no excuse for industry or government to subject harm, disease, or any hazard on the public because of non-compliance. These situations should be met with immediate actions including employee terminations, forced resignations, fines, and even incarceration. Why shouldn't the local health department sanitarian be jailed for allowing an unsafe swimming pool or hazardous restaurant to remain open?

On a more positive note, let's review the parameters for developing a successful enforcement program. Successful program management, regardless of the type of program involved, is dependent on the execution of five factors: Plan; Organize; Implement; Motivate; and Evaluate.

Program Planning

The key to success of any enforcement program is not only short-term tactical planning, but long-term strategic planning as well. A five year plan, based upon progress to date, is essential to anticipate future needs and problems.

It has been said that "if you don't know where you are going, any road will take you there." It is this unknown road that can become a costly and treacherous experience for an organization to take. Planning is the only way to minimize such unfortunate experiences.

Designing effective communication systems among and between departments is the primary step in laying a solid foundation for program management. One can't appreciate what he doesn't understand - and if someone doesn't understand what the program will do, it won't be appreciated. Therefore, the development of various written communication systems such as news releases, technical bulletins, newsletters, illness reports, etc., are all communication efforts to alert others of enforcement activities.

Good communication means good awareness. In some programs, such as employee safety or consumer safety, awareness is the principle factor in reducing hazards. Reduced accidents result in a tremendous cost savings to everyone involved.

Some services provided by the enforcement program should be evaluated for their marketability. A Microbiological Laboratory, field inspection team, etc., should be asked these questions:

1. Who else could use this service?

2. What would it cost to provide it to them?
3. What financial gains could be achieved by contracting out a service?

Program Organization

All enforcement activities must start with sound program specifications and regulations. They need to be clear, concise, and as the computer industry says "user friendly". In rules complicated with legal language, the enforcing agency or department must provide clear explanations or interpretative guides.

Program specifications also apply to people. Quality, professional, educated, and well-compensated employees can make any program successful. Remembering to hire quality, not quantity, will go a long way in making your enforcement activity a winner. You will be only as strong as your weakest link. Emphasis must be placed to hire the strongest and best person at the lowest level. By doing this you continually force yourself to hire better and better personnel as you go up the ladder. Build your program from the bottom up, not the top down. If you don't think this is important, try constructing a building starting with the top floor.

In conjunction with personnel, the organization phase must incorporate professional training on an ongoing basis. Provisions for continuing education are essential for the ultimate success of program management. We will discuss training further in the motivation phase.

In organizational planning it is important to remember that you get what you pay for. Inexpensive labor will give you bodies, but probably not much more than that. You can't build anything strong, including an enforcement program, on weak, incompetent, and poorly trained personnel. Your guiding light when it comes to training must be "training is an investment, not an expense." Remember, you are investing time and money to reap a greater return in the future on the successful execution of your enforcement activities.

Quality management is a systematic way of guaranteeing that organized activities happen the way they are planned. It is a management discipline concerned with preventing problems from occurring by creating the attitudes and controls that make prevention possible.

Quality management is needed because nothing is simple anymore, if indeed it ever was. Our sophisticated business world is like airplanes flying by remote control with instructions filtered through layers of subordinates. The people who really control activities do so from offices, laboratories, studios, and other remote places. The further the administrator gets from the administered, the less efficient the administration becomes.

Program Implementation

No matter how you say it, where you say it, or how many times you say it, it is the basic premise for your success, "people respect what you inspect." You must be out there inspecting, ensuring that people are complying with your standards. If you don't care, the business or industry involved won't care either.

You must enforce your standards. This is where top management support is critical. Without it you will enjoy only limited success. The key ingredients here are: Be positive; Be professional; Be helpful; and Be firm. A positive and professional attitude and appearance will go a long way in capturing your audience into compliance. Projecting a helpful attitude will "lasso in" those who may display resistance or are unsure on how to meet your standards. By being firm you will set your standards as activities that "must" occur, not "nice to do".

Perception is reality. What people perceive about your enforcement activity is the real world. It is not what you think it is, or planned it to be. Your enforcement personnel play a critical role in program perception.

The enforcement activity must be fair, consistent, and thorough. All businesses or operations of the same type must be treated the same without special favors or exclusion. Consistency among and between operations is essential. If you require food to be covered in a walk-in refrigerator in a fullservice restaurant, then the same standard must be enforced at the county jail's foodservice operation or the restaurant across town. A thorough inspection is the only inspection. Inspections made in haste are waste. Precursory inspections produce little in image, training, professionalism, or compliance.

After the inspection is over, the next critical elements are follow up and follow through. Verification of compliance is more important than identifying non-compliance. A hazard gone uncorrected is deadly to your enforcement program, if not to the consumer. If follow up procedures are not utilized, your program will fall apart over time.

Use orienting, helping, talking, guiding, badgering, and whatever; to keep the pressure on. New people joining the organization must be made to feel that participating in the program is routine and expected.

Program Motivation

People often fail to recognize program motivation in managing a program activity. Yet, it is probably the most important in successful execution and long-term effectiveness.

Promote your success. When your enforcement program has prevented illness, death, or destruction, let people know. Toot your own horn because no one else will. People should know how the controls you monitor and enforce have paid positive results.

Motivate your people that enforce the program and motivate those you regulate. Motivation can be achieved by awards, bonuses (not necessarily financial), congratulatory letters, and peer recognition. Recognition can serve as honey in your control program. Sweet recognition can produce tremendous results.

Train, train, train . . . Training is a key element in your motivational program.

Compliance to standards needs to be a valued organizational outcome. Training is the only mechanism by which an organizational commitment can be achieved. One can't mandate it, inspect it, or engineer it, "it" is a learned behavior. Training, supported by other functions previously discussed, is the key element in establishing a learned behavior.

Training in environmental health programs, is essential at all levels of management to enhance positive behaviors from subordinates and hourly wage earners. It costs money to train - but it costs more money not to train. Evidence from sanitation training programs has shown that not only have public health concerns decreased, but attitudes toward sanitation and safety by management personnel also have changed significantly for the better. It is this behavioral modification that will produce the long-term results for enforcement programs, and not the multitude of inspectional personnel or by the examination of managers through testing alone.

As environmental health professionals, if we fail to train, we fail to convince - if we fail to convince, we fail.

People are not born with a burning innate desire to practice compliance. They must be taught at all levels. Therefore, causing management to have the right attitude about compliance, and the right understanding is not just vital - it is everything.

Program Evaluation

The last part of program management is probably the most important. It has been said that "the only thing permanent in life is change."

Periodically it is necessary to re-examine ongoing procedures or programs to ensure that they continue to be the best alternative for the desired end result. It may be advantageous to completely change or expedite a new procedure to achieve the desired outcome. You should not hesitate to examine all procedures, even "sacred cows", and develop alternatives, where needed, to accomplish the end result in a more economical and beneficial manner. Just because you're first doesn't mean you stay first.

The evaluation of people are also important criteria. Comprehensive reviews should let people know where they stand and what is expected of them. Where performance is substandard, training or other developmental tools can be used. Continued poor performance must be met with job change or termination. A poor performer is like a malignant tumor, it must be excised or it will infect the whole body. As an enforcement program manager, how can you get compliance from those you audit if you can't control your own standards?

In summary, you must be able to be flexible and open minded. Your enforcement programs must change with the times. As advances in science and technology occur, so should your control functions. Control of public health diseases through enforcement programs governing leper colonies, common drinking cups, pit privy sanitation, house quarantining, and fill and draw swimming pools, have all but vanished from the scene. Today, Listeria, AIDS, hazardous waste, medical waste, and space waste are calling for enforcement programs.

The development of a successful enforcement program is predicated on the execution of thoughtful planning, definitive organization, thorough implementation, motivated participants, and continuous program evaluation. The cumulative affect of these five essential elements will provide a comprehensive activity second to none.

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A Research Note

Estimation of Analyst Performance for Thermistor Cryoscope Freezing Point Testing

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Abstract

The American Public Health Association method for water added to milk was evaluated for analyst performance. Results from the Food and Drug Administration evaluation of milk laboratories program show that the overall 1983-1987 repeatability relative standard deviation (RSD_r) and reproducibility relative standard deviations (RSD_R) were 0.023 and 0.053 for one analyst per lab. Limits of L1 = 0.016 and L2 = 0.011 were suggested for the milk laboratories program and evaluated on the freezing point data from 1983 to 1987.

The methods for dairy products analysis used in the National Conference on Interstate Milk Shipment programs are published by the American Public Health Association (APHA) (10). A recent report (3) outlined procedures for acceptance of new APHA methods. Under an agreement between the Association of Official Analytical Chemists (AOAC) and the APHA, official dairy methods will be collaboratively studied with the AOAC before being included in new editions of the APHA Standard Methods for the Examination of Dairy Products. Among the requirements of method acceptance is the specification of analyst performance (7).

Many of the current APHA methods (10) were adopted before these requirements (7) were applicable. Five of the most widely used tests: direct microscopic somatic cell count, electronic somatic cell count, plate loop count, standard plate count, and Wisconsin mastitis test (DMSCC, ESCC, PLC, SPC and WMT), have been studied and the analyst performance has been reported (9). The thermistor cryoscope (10), used to determine the freezing point of fluid milk, is performed to determine if water has been added to milk. The results are reported in degrees Hortvet (°H) and compared to a standard to determine the percent of water added to milk. The method was studied collaboratively (5) for the AOAC. The objective of this note is to present results on the variability of the test observed as part of the FDA split sample program, and to recommend limits to be used in the Evaluation of Milk Laboratories (11).

Materials and Methods

Preparation and Shipment of Split Samples

The procedure for preparing and shipping annual duplicate split milk samples is given by Donnelly et al. (2) and Peeler et al. (8).

Freezing Point Procedure

The method for the thermistor cryoscope is given by APHA (10).

Statistical Methods

Grayhill (4) describes the method for computing components of variance. These estimates are obtained assuming a completely random one way analysis of variance (ANOVA) model for each pair of blind duplicates. Tests for normality and transformations were examined as outlined by Bowman and Shenton (1) and Hoaglin et al. (6). Duplicate portions from the four analytical units used to measure somatic cells were also used to obtain freezing points (11). One analyst was randomly chosen from each lab to conform to AOAC (7) design.

Results and Discussion

The Evaluation of Milk Laboratories (11) outlines the requirements for conducting a split sample program for NCIMS. Each year the FDA Laboratory Quality Assurance Branch sends split milk samples to state central laboratories. Four of these analytical units are analyzed for both direct microscopic somatic cell counts and freezing points. Each of the four samples was used to estimate the components of variance (4,7) for the method. Data from 1983 through 1987 were included in the calculations. Outliers were deleted as suggested by AOAC (7).

Computation of the components of variance (4) required for the analyst performance standards (7) are based

on one-way ANOVA model. Components were computed for each duplicate pair. It is assumed that the variable (°H) or its transformation is normally distributed. Based on Pearson moments (1), the normal distribution should have an estimated coefficient of skewness = 0 and kurtosis = 3. Data in the study were tested by two procedures (1,4) to determine which, if any, transformation was needed to normalize the data. Using the procedure for power transformation in Hoaglin et al. (4), it was determined that no transformation was necessary. This confirms the choice of Henningson (5) in his AOAC study. The variable expressed as °H was approximately normally distributed.

Table 1 presents the performance estimates commonly reported by the AOAC (7). The repeatability relative standard deviation (RSD_r), reproducibility relative standard deviation (RSD_R), and standard deviations (S_r and S_R) are also listed for each sample pair. Mean °H ranges from 0.535 to 0.629. The ranges for S_R and RSD_R were 0.00317 to 0.00684 and -0.8 to -1.3. Estimates of S_R and RSD_R from the AOAC collaborative study (5) were 0.0049 and -0.095.

The mean, median, and 5 and 95 percentile estimates are shown in Table 2. Means and medians are close together, indicating symmetrical distribution. The S_R ranges from 0.00317 to 0.00684 with estimated 5 percentile of 0.00324 and 95 percentile of 0.00681. The RSD_R ranges from -0.6 to -1.3 with 5 and 95 percentile estimates of -0.61 to -1.30. The range is narrow with the upper RSD_R only 2.2 times the lowest value.

The performance standards can be used to suggest limits for use in the Evaluation of Milk Laboratories (11) program. Based on the pooled (4) S_R = 0.0053, limits of L1 = 0.016 and L2 = 0.011 (°H) would be recommended. The purpose of these tests (11) is to determine if analysts are performing within accepted standards.

TABLE 1. *Components of variance for thermistor cryoscope for milk split samples - 1983 to 1987l.*

Year	Sample Pair	Mean °H	S_r	S_R	RSD_r	RSD_r
1983	1	-0549	0.00176(30)[a]	0.00519	-0.3	-0.9
	2	-0.571	0.00228(30)	0.00475	-0.4	-0.8
	3	-0.541	0.00129(30)	0.00471	-0.2	-0.9
	4	-0.542	0.00141(30)	0.00541	-0.3	-1.0
1984	1	-0.542	0.00236(31)	0.00482	-0.4	-0.9
	2	-0.549	0.00162(31)	0.00575	-0.3	-1.0
	3	-0.542	0.00181(31)	0.00522	-0.3	-1.0
	4	-0.542	0.00209(31)	0.00476	-0.4	-0.9
1985	1	-0.629	0.00237(31)	0.00570	-0.4	-0.9
	2	-0.546	0.00356(31)	0.00536	-0.7	-1.0
	3	-0.541	0.00302(31)	0.00492	-0.6	-0.9
	4	-0.542	0.00204(31)	0.00466	-0.4	-0.9
1986	1	-0.546	0.00292(29)	0.00493	-0.5	-0.9
	2	-0.538	0.00325(29)	0.00609	-0.6	-1.1
	3	-0.551	0.00278(29)	0.00317	-0.5	-0.6
	4	-0.535	0.00337(29)	0.00622	-0.6	-1.2
1987	1	0.543	0.00290(34)	0.00528	-0.4	-1.0
	2	-0.540	0.00174(34)	0.00561	-0.3	-1.0
	3	-0.541	0.00159(34)	0.00576	-0.3	-1.1
	4	0.537	0.00180(34)	0.00684	-0.3	-1.3

[a]Degrees of freedom.

TABLE 2. *Distribution summary[a] for the freezing point - Mean, S_r, S_R, RSD_r and RSD_R.*

Source	Mean	Median	5-Percentile	95-Percentile
Mean (°H)	-0.548	-0.542	-0.535	-0.626
S^b_r	0.00226	0.00209	0.00130	0.00355
S^c_R	0.00526	0.00525	0.00324	0.00681
RSD^d_r	-0.41	-0.40	-0.21	-0.70
RSD^e_R	-0.97	-0.95	-0.61	-1.30

[a]Based on one analyst randomly chosen from labs.
[b]Repeatability standard deviation.
[c]Reproducibility standard deviation.
[d]Repeatability relative standard deviation.
[e]Reproducibility relative standard deviation.

Limits of L1 = 0.016 and L2 = 0.011 were used to determine what percent of analysts would have had acceptable results if the limits had been applied on data submitted from 1983 to 1987. Table 3 gives a summary of percent of the average rejection per sample and the percent of analysts out of limits on two or more of the eight samples from each year. Nine percent of the analysts would have been identified on average for the 5-year period. The test should only reject 5% of analysts by chance alone.

TABLE 3. *Application of suggested performance limits on freezing points reported between 1983 and 1987.*

Year	Total number of observations	Average percent[a] of observations out of limits per sample	Average percent of observations out of limits per sample when three labs are deleted	Percent of Analysis out of limits 2 or more times when three labs are:	
				Included	Deleted
1983	752	3.7	1.7	7.4	2.1
1984	704	5.5	2.7	10.2	4.5
1985	760	10.1	4.5	12.6	5.3
1986	656	3.4	2.7	8.5	6.1
1987	808	5.6	1.5	6.9	1.0
Overall					
	3680	5.7	2.6	9.1	3.7

[a]Limits L1 = 0.016 and L2 = 0.011 applied as shown in Evaluation of Milk Laboratories (11).

Further study of the results indicates that three laboratories accounted for 57 percent of the deviant values. The removal of these three labs reduced the rejection rate to 3.7 percent. It is likely that the problem is due to calibration. Two analysts in the three labs were out of limit for 2 and another 3 years in a row. We conclude that the reproducibility standard deviation (S_R) equal 0.0053 could be used in the split sample program for thermistor cryoscope freezing point testing.

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News

National Restaurant Association To Sponsor First National Symposium On Solid Waste

In recognition of the growing crisis in solid waste management and the need for a resolution to the problem, the National Restaurant Association is sponsoring a one-day symposium to explore the foodservice industry's role in the current and future challenges of solid waste management.

The symposium, entitled "Managing Solid Waste: Answers for the Foodservice Operator," will be held on Tuesday, January 9, 1990, at the J.W. Marriott Hotel in Washington, DC. The meeting marks the first time that industry operators and suppliers, state and local government representatives, and experts in the area of solid waste will come together specifically to discuss this increasingly pressing environmental issue.

"The solid waste problem is one of the most visible issues affecting the foodservice industry today," said association President Harris H. "Bud" Rusitzky. "Even though industry packaging accounts for less than one-third of one percent of the nation's solid waste, the general public believes our contribution to be much greater."

"Through this symposium, we hope to bring legislators, media and the public at large the true facts about the industry's role in the solid waste problem. At the same time, we hope to develop voluntary programs to manage effectively the small amount of industry-generated waste and perhaps to make an impact on the larger, overall solid waste problem as well," said Rusitzky.

At the symposium, panels of operators, legislators and solid waste experts will discuss a wide range of topics, including: a national overview of the solid waste situation; a review of state and local conditions; a discussion of disposal alternatives, including recycling and energy recovery; a look at state-of-the-art supplier innovations; and operator case studies, outlining real-life solid waste management situations. Attendees are encouraged to bring their own experiences for discussion and review during the extensive question-and-answer periods following each panel presentation.

"By the end of the day, attendees will have a clear idea of the steps we can take to find comprehensive solutions to the problem to ensure the safety of our planet for generations to come," Rusitzky said.

Registration for the National Restaurant Association's Symposium on Solid Waste Management is $65 per person. To register, contact the association's technical services department at 800-424-5156 or 202-331-5900; or write to the National Restaurant Association, Symposium on Solid Waste Management, 1200 Seventeenth St., NW, Washington, DC, 20036.

Press registrants should contact Anne Papa, manager of media relations, at 202/331-5938. Press registration to the symposium is complimentary.

To Check 'Salmonella IQ' Chemist Prepares Self-Test

Salmonella, a type of bacteria that can be found in poultry and meats, can be avoided in most cases by following a few simple rules, according to Marvin Winston, an expert in food testing and analysis.

Winston, a chemist, is president of Winston Laboratories. The firm specializes in food testing, microbiology and food safety.

Winston says periodic salmonella scares have produced myths and uncertainties about food bacteria and how to effectively rid poultry, meat and other foods of them.

He suggests these precautions:

Because of the possibility of cross-contamination, consumers should isolate all raw meat and poultry and used utensils to avoid bacteria from spreading to kitchen surfaces and other foods. Knives and cutting boards should be washed thoroughly between usages.

Most bacteria are killed once cooked, but can grow back at room temperature. Cooking meat thoroughly, thawing only in the refrigerator, reheating leftovers thoroughly, and promptly refrigerating all leftovers are examples of what Winston calls the "keeping the cold cold and the hot hot" method of preventing the growth of bacteria.

Winston has prepared a self-test questionnaire for consumers and restaurant personnel.

Salmonella Information
Quiz

TRUE OR FALSE

1. Salmonella is a bacterium that can cause disease in both man and animals.
2. Salmonella is relatively new. Only in the past 12 years has its significance become known.
3. Salmonella cannot be destroyed once present in food.
4. Symptoms of salmonella infection can include fever, cramps, diarrhea and sometimes vomiting.

5. No one actually dies from salmonella infection.
6. Prolonged periods of turkeys sitting at room temperature while being hand-carved can enhance the opportunity for salmonella to grow.
7. Homemade eggnog made from store-bought eggs, Monte Cristo sandwiches made of sliced cooked meat and cheese dipped in raw egg and grilled, and Caesar salad dressing made with raw eggs have all been vehicles of transmission for recent salmonella outbreaks.
8. Salmonella can be reduced in poultry by methods such as irradiation. This technique has been found safe for many foods including poultry and costs could be minimal. The drawback is the perceived rejection by consumers who associate irradiation with a radioactive product.
9. Improved sanitation could largely reduce salmonella at the breeder flock level, hatchery supplies and broiler production.
10. Salmonella may be living in liquid or frozen eggs but would not be present if the eggs have already been dehydrated (powdered).
11. More than 2,000 different types or strain of salmonella are known.
12. Potentially hazardous foods once cooked, should be cooled to a safe temperature of 45 degrees Fahrenheit or less within six hours.
13. Wiping cloths used around work stations should be rinsed off between usages.
14. Spices have never been implicated in a case of salmonella food poisoning.
15. Drug treatment for salmonella food poisoning is recommended for quickest recovery.
16. Chickens with the Kosher marking are less likely to contain salmonella than non-Kosher birds.

ANSWERS

1. True.
2. False. In 1966, an official of the Food and Drug Administration said salmonella "poses as great a problem as any facing the public health." In 1970, Congress passed the Egg Products Inspection Act to protect against salmonella outbreaks associated with bulk egg products.
3. False. Properly heating foods kills most bacteria. Also, chemicals are available that are approved for such purposes and for specific foods.
4. True.
5. False. Although generally not fatal, the very young or very old, or persons already weakened, can be in real danger.
6. True. This was concluded to be one factor at a wedding in June 1981 in Canada. Also, inadequate reheating and a haphazardly-operated refrigerated truck were factors.
7. True. Reported by health officials in Atlanta for the approximate period October 1986 to April 1987.
8. True.
9. True.
10. False.
11. True.
12. False. Four hours is the maximum time for safety.
13. False. Wiping cloths should be soaked in a solution made up of one teaspoon bleach per gallon of water or other recommended sanitizing agent.
14. False.
15. False.
16. False. No scientific data is available to substantiate this.

For more information contact Marvin Winston, M.S., 201-440-0022.

American Food Production System Attacked: Microbiological Food Contaminates More Dangerous Than Additives

Many groups concerned with food safety are pointing the finger in the wrong direction - toward food additives instead of microbiological contamination.

According to Dr. Sanford Miller, director of the University of Texas Health Science Center in San Antonio, our food system is under attack.

This attack is coming both from within the United States and from abroad, but few of the attacks are really aimed at food safety, Miller said at the 1989 Texas A&M University Beef Industry Conference on Aug. 14.

"The EEC (European Economic Community) ban on hormone-treated beef is really just a non-tariff trade barrier that has no scientific basis," he said. "And these bans are not going to stop unless the United States stands up to them."

Miller said that rather than being concerned with whether a food is "natural" food, or pesticide residues, Americans would be better off worrying about microbiological contamination of food, which is a much larger threat.

"The major problem in our food supply is not a chemical problem, but a microbiological problem," the health scientist said. "Some bacteria are adapting to grow in refrigeration, which is our last line of defense."

However, because public attention is focused on chemical additives and pesticide residues, money is being taken away from the microbiological work.

Additional problems in food regulation in this country are caused by having three agencies involved in food safety, Miller said.

The Food and Drug Administration (FDA), the United States Department of Agriculture (USDA) and the Environmental Protection Agency (EPA) are all three responsible for some aspect of regulation.

"If the heads of the agencies all get along, then everything is OK; if they don't, then you have total confusion," said the former official of the Food and Drug Administration.

For example, a cheese pizza is regulated by the FDA, but a pepperoni pizza, because of the meat, is covered by the USDA, Miller said.

Miller said that the best response the public can take is to lobby hard for the funding and support needed to satisfy the demand for a good food supply into the next century.

For more information, contact Deborah Dunsford (409) 845-2211.

AFFI Voices Concern Over Mandatory Labeling Legislation

The American Frozen Food Institute (AFFI) has raised concern about the current draft of legislation pending in the House of Representatives and the Senate that would mandate nutrition labeling on almost all food products regulated by the Food and Drug Administration (FDA), including frozen foods.

AFFI made its comments in a letter to Rep. Henry A. Waxman (D-Calif), chairman of the House Energy and Commerce Subcommittee on Health and the Environment. Waxman is the author of the House version of the legislation (H.R. 3028). Similar legislation has been introduced in the Senate by Sen. Howard M. Metzenbaum (D-Ohio).

"The food label is a very useful vehicle to provide consumers with information that is truthful and meaningful, and to enable the American public to select those food products that best suit their needs," AFFI Executive Vice President Steven C. Anderson stated in the comments, "Food manufacturers increasingly are providing nutrition data and related information voluntarily in response to their customers. In addition, FDA has substantial authority under its existing statutory mandate to require that information be provided so that food labeling is not false or misleading in any material respect."

The legislation would call for labels to contain the following information: serving size; number of servings per container; number of calories per serving and the calories derived from fat; and the amount of fat, saturated fat, unsaturated fat, cholesterol, sodium, total carbohydrates, complex carbohydrates, sugar, total protein, and dietary fiber per serving. Additional information could also be requested by FDA. Raw agricultural commodities would be subject to disclosure of nutrition information in a modified form. Excluded from the requirement for mandatory nutrition labeling would be foods offered for immediate consumption and foods processed an prepared in a retail establishment.

Anderson continued, "we strongly believe, however, that food labeling should be prescribed on a nationally uniform basis. The issues involved in food labeling are complex and must be thoroughly considered, and any revisions to either the regulatory or statutory authority of FDA must not be undercut by the imposition of state labeling requirements that are additional to, different from, or inconsistent with federal requirements. The bill as currently drafted not only permits states to continue to impose such requirements, buteven gives the states authority to enforce both the state and federal requirements.

"The nature of food production, processing and distribution occurs on a nationwide basis," Anderson said, "laws such as California's Proposition 65, however, have resulted in warnings on products that are perfectly safe. Other states are considering similar legislation and, if enacted, would seriously affect the interstate distribution of foods in a national market. Food labels must provide all American consumers, wherever located, with a product that is accurately and uniformly labeled, so they know what information they can expect to find on labels and learn how to use it."

AFFI also raised questions about the impact of the legislation on the labeling of products processed for foodservice. "We are also concerned about the breadth of the bill," said Anderson in the comments. "We note that food offered for immediate consumption and foods processed and prepared in a retail establishment would be exempt from nutrition labeling. We support this concept because nutrition labeling could not be provided in a meaningful manner for these products, as consumers are not frequently, if ever, provided with labeling information at the time of consumption. For similar reasons," Anderson concluded, "nutrition labeling should not be mandated for products sold through other forms of foodservice."

AFFI is the national, non-profit trade association that has represented the interests of the frozen food industry for over 40 years.

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

Program Users and Potential Program Users:

Over the past year, our Food Protection Certification Program has continued to grow. Test volume has increased. Another state, Maryland, has approved use of our test. We are actively conducting recertification testing in Texas. We are also preparing to bid on the certification testing in Florida, which will test more people in 1990-1991 than in the other 49 states combined.

We have concluded a careful study of the program and have decided to make some changes we believe will improve the service. Those are:

1. We are aligning ourselves more closely with sanitation training programs. Over ninety percent of our tests are given at a training site at the end of a corporate, health department, or community college course. This type of testing, called special administrations, is arranged by program trainers. An ETS supervisor comes to the training site and administers the test under standard conditions. The testing is convenient to training sites and there is no waiting between the end of training and testing.
2. We have redesigned our processing system so that score reports and rosters can be released within 5 working days. No longer will you have to wait more than two weeks for your scores.
3. Although we require you to have at least 15 people to test at a special administration, special provisions have been established to test smaller numbers on a case by case basis. You must plan these well in advance, however.
4. We can administer our test to individuals in our regional offices (Brookline, Massachusetts; Princeton, New Jersey; Washington, DC; Atlanta, Georgia; Evanston, Illinois; Austin, Texas; Pasadena, California; and Oakland, California). You can test anytime at these locations on an individual basis.
5. Because relatively few people take the test at our national centers, and because we want to keep our current price, we have reduced the number of national administrations to twice a year (November and May).

Our goal is to integrate a secure, valid, and independent testing program with current sanitation training efforts. We firmly believe that both training and confirming the knowledge gained while training through independent testing is the best means of promoting public health. Toward that end, we would like to hear from you how we can make the process work better.

For more information contact, Gary Echternacht, Program Director, 800/251-FOOD.

Three Educators Win Sherman Awards For Food Protection Article

The 1989 Sherman Awards of The Educational Foundation of the National Restaurant Association were presented August 16 to Karl F. Eckner, Edmund A. Zottola, and Robert B. Gravani, at the 76th annual Education Conference of the International Association of Milk, Food and Environmental Sanitarians in the Crown Plaza Hotel in Kansas City, Missouri.

The Sherman Awards are offered annually to provide recognition to magazine articles from the Journal of Food Protection and Dairy and Food Sanitation (now called Dairy, Food and Environmental Sanitation as of January, 1989) that best reflect the principles of Norbert F. Sherman, late treasurer of The Educational Foundation.

Sherman was an outspoken advocate of improved industry standards, whose cornerstone philosophy was grounded in integrity and responsibility. The nominations are judged by a panel of judges appointed by The Educational Foundation.

Eckner, a graduate research assistant studying food microbiology at the University of Minnesota; Zottola, a food microbiology professor from the University of Minnesota; and Gravani, a food science associate professor from Cornell University, received the awards for their article, "The Microbiology of Slow-roasted, Stuffed Turkeys," published in the July, 1988, issue of Dairy and Food Sanitation.

The authors warned of two current trends that can lead to a potential health hazard. • The trends are an interest in more nutritious foods like turkey and the desire to devote less time to food preparation. "These two themes have been united in the long-time, low-temperature roasting methods for stuffed turkeys," they stated.

"Concerns about the microbiological safety of foods prepared in this manner are valid," they said. "If cooking and holding temperatures are too low, the microbes present may not be destroyed or inhibited; they may even be able to proliferate and/or produce toxins. Turkey stuffing is known to be a vector in many cases of foodborne illness."

The study, conducted using a nationally published recipe for slow-roasting stuffed turkeys at low temperatures, concluded that the recipe is safe for consumer use, but voiced concerns that roasting completion be judged only by the color of the juice and that uneaten stuffing be handled correctly.

Anita L. Owen Joins National Dairy Council As Senior VP, Nutrition Education and Research

Anita L. Owen, M.A., R.D., has been named senior vice president of Nutrition Education and Research at NATIONAL DAIRY COUNCIL® (NDC).

The announcement was made by United Dairy Industry Association (UDIA) Chief Executive Officer M. F. Brink, Ph.D., at the association's recent board of directors meeting.

"The challenge was to find the ideal leader for NDC - one who is a strong nutrition educator and a savvy business manager," said Brink. "With Anita, I'm pleased to say, we have both. She has outstanding academic credentials as well as work experience with health professionals, consumers, educators, and business leaders. We look forward to new accomplishments for NDC under her leadership."

In her new post, beginning Sept. 5, Owen will oversee all programs of NDC - Nutrition Education and Public Affairs, and Nutrition Technical Services.

"It is a privilege to be associated with NATIONAL DAIRY COUNCIL, which has had a rich, 75-year heritage of providing quality nutrition education programs to professionals and consumers," said Owen. "Meeting the nutrition education challenges of the '90s will require imagination, creativity and change. I am happy to be a part of this effort."

Since 1986, Owen has been manager of nutrition at Nabisco Brands, Inc., where she led a team of 20 corporate executives to develop nutritious food products, including new products, reformulations and line extensions.

A renowned leader in the field of nutrition education and public health, Owen comes to UDIA with 30 years' experience and an impressive list of accomplishments. These include serving as the president of the American Dietetic Association (ADA), the nation's largest group of nutrition professionals, for the 1985-86 term. She is incoming president of the ADA Foundation and will begin her term at the ADA Annual Meeting in October.

She is a member of several other scientific and professional organizations, including the American Institute of Nutrition and the American Society for Clinical Nutrition. Owen is also a member of many advisory committees on nutrition and health and has published widely in these areas.

Owen began her career as a clinical dietitian in New York. She then became involved in public health, first as chief nutritionist and then as director of community health services for the Arizona Department of Health.

She gained notoriety in the field of public policy at both state and national levels. At the national level, Owen was instrumental in designing the Supplemental Feeding Program for Women, Infants and Children (WIC), and she developed the first WIC program in the nation.

Throughout her career, Owen has served as a nutrition consultant to numerous organizations and associations, including Bristol Myers, Mead Johnson, Westinghouse, Heinz USA and the National Livestock and Meat Board.

She is on the adjunct faculty at New York Medical College, the University of Hawaii and New York University. Owen has also taught at the University of Michigan where she was assistant professor in human nutrition. She co-authored the textbook, *Nutrition in the Community - The Art of Delivering Services,* used by students in nutrition at the graduate and undergraduate levels.

Owen earned a B.S. in Dietetics and Education from Marywood College, Scranton, Pa., and a M.A. from Teachers College, Columbia University, N.Y.

NATIONAL DAIRY COUNCIL® conducts nutrition education and research programs as part of United Dairy Industry Association. UDIA is a 26-member federation which coordinates a total promotion program for U.S.-produced milk and other real dairy foods.

For more information contact Lisa Coe, 312/696-1020.

Promotion of Bruce Williamson

Meadow Gold Dairies has announced the promotion of Bruce Williamson to president and general manager of the Hawaiian Meadow Good operations based at 925 Cedar St., Honolulu. He succeeds Richard Walrack who has served in the position since early 1986.

Williamson has most recently served as general manager of the Meadow Gold operation in Englewood, Colo. He joined Meadow Gold Dairies in 1971 as an accountant in Lincoln, Neb., and advanced through management positions in Ohio, Louisiana, and Nebraska. Williamson received a B.S. degree from Nebraska Wesleyan University in 1970.

For more information contact Christine S. Tilton, 614/225-4472.

Industry Products

The products included herein are not necessarily endorsed by Dairy, Food and Environmental Sanitation

New Dairy Flush-Cleaning System

Babson Bros. Co., Naperville, Illinois; Agpro, Inc., Paris, Texas; and Five-G Consulting, Inc. of Molalla, Oregon, have jointly developed a new dairy flush-cleaning system. The new system known as "Superflush" is being marketed as part of the Surge Custom Line.

D. Joe Gribble, an Agricultural Engineer with Five-G Consulting states, "This joint effort is producing results far superior to conventional flush-cleaning systems. As most design specialists know, the key to successful flush cleaning for milking parlors, holding pens, free stalls and cattle feeding areas is high flow rates. The "Superflush" concept incorporates very efficient internal hydraulic designs for the valves, piping systems, reservoirs and controls. These unique features allow short-term flow rates up to 6,000 gpm through the Superflush Popup Discharge Valves. It may sound backwards, but the higher the flow rates, the less total water required to clean a given cattle floor area. Typical valve open times for cleaning the floors in a 100-cow free-stall lane run from 30-40 seconds. These short, high-flow time cycles are giving a very complete cleanup of large manured areas. In some installations we have been able to get the job done with 25-30% of the total water required for conventional flush-cleaning equipment, including some of our older systems. Increasing energy costs and tighterregulations for pollution control dictate the need for more efficient flush-cleanup equipment."

Slurry pumps, manure solids separators, flow-rate control valves and other components necessary for complete waste management systems are available as part of the Surge Custom Line. For more information, contact your nearest Surge dealer or **Babson Bros. Co.**, Naperville, Illinois.

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*Operations Pac Software is Now Available from **Datastream***

Operations Pac from **Datastream** is a data management software package designed for use in water and wastewater treatment facilities. Operations Pac has an easy to use installation program, and all programs are menu driven. Operations Pac provides data entry, storage, and retrieval of treatment plant "variables".

Using the Custom Reporting Section, treatment plant professionals can produce "custom" and standard reports. The Custom Reporting Section is typically used to produce State and Federal (NPDES) reports. The Stat-Graph feature allows the user to statistically and graphically (line & bar chart) analyze plant activity using the data from the Operations Pac. Probability, correlations and multiple linear regression plots are also available.

Performance Pac features three major elements for evaluations of activated sludge systems: oxygen/aeration requirements, solids production, and clarification. The analysis is based on material balance using the data base created by the Operations Pac Software.

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News Release Model SM-10 Porta Lab^R Salt Analyzer

The Porta-Lab^R, Model SM-10, was developed by **Presto-Tek Corporation** for the food processor for fast, accurate measurements of the percentage of salt content of foods.

Porta-Lab^R is simple to operate and may be used at the process line or in the quality control laboratory-- operating on both AC 110 or 220Volts and heavy duty, rechargeable Nickle-Cadmium batteries.

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*Free **ATCC** Fungi & Yeast Reference Catalogue Update, December 1988 Edition, Now Available!*

The **American Type Culture Collection** is pleased to announce the availability of the 1988 *ATCC Fungi/Yeast Update*, a supplement to the 1987 ATCC Fungi & Yeast Reference Catalogue. The 1988 *Update* includes 1150 new strains, representing 600species. As with the 1987 reference catalogue the *Update* contains scientific information useful to industry and academia such as literature citations which indicate uses of the cultures, recommended growth media and media formulations. Both the 1988 *Fungi/Yeast Update* and 1987 *Reference Catalogue* are FREE to U.S. customers. A modest shipping & handling fee is charged for catalogue shipments to locations outside the USA.

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*Reclosable Plastic "Zipper" Introduced by **Presto***

Fresh-Trak(TM) reclosable plastic "zippers" for the packaging industry have been introduced by **Presto Products**, one of the nation's leading private label and specialty film products manufacturers.

Fresh-Trak zippers are designed to offer outstanding sealing capabilities, yet be easy to open and close. The zippers are compatible with most films, and can be applied by manufacturers in a wide range of production settings. **Presto** has offered technical assistance.

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Intrinsically Safe Dust Monitor Provides Real Time Data

The RAM-1 and the intrinsically safe RAM-1-2G, from **MIE**, Inc, Bedford MA, offer real time determination of total or respirable dust. The RAM-a and -2G use near forward infrared light scattering to sense dust concentrations in the range of 0.001-200 mg/m^3. Sampling is accomplished by an on board battery operated pump, whose sampling flowrate is 2 liters per minute.

The MIE RAM-1 is designed to monitor and report contamination from dust, smoke, fume, and mists over three different user selectable ranges: 0-2, 0-20, or 0-200 mg/m^3. Rapid changes in dust concentrations can either be observed and recorded as they happen, or smoothed out by the user adjustable integration time constant. In addition, the RAM-1 has built in "zero" air filtration and a reference optical scatterer so that field calibration can be accomplished in any environment, without external calibration gases. The battery powered RAM-1 or RAM-1-2G is a highly portable 8"x8"x8" cube, weighing approximately 9 lbs.

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Product Brochure

Porter International has devised a brochure that specifically outlines their products that are approved for regulated environments by the FDA, USDA, EPA, and NSD.

The brochure consists of eight pages of information pertaining to each agency's requirements for coatings approval, and it lists our products both by generic type and product number that are approved for incidental food contact, direct food contact, and potable water applications.

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*Full Line of Sellers^R Cleaning Equipment Featured in New Brochure from **Prosser/Enpo Industries, Inc.***

Prosser/Enpo Industries manufactures a complete line of Sellers Cleaning Systems Products designed for a wide range of internal and external cleaning applications. A new informational bulletin covers tank cleaners and hydraulic jets (injectors) detailing product features and application information.

The full line of Sellers rotary tank cleaning machines, in a variety of operating pressures and capacities, deliver cleaning solutions to clean the interiors of tanks and other storage vessels up to 70 feet in diameter. Sellers tank cleaners are made of stainless steel and food grade plastic for corrosion resistance and low maintenance. Designed for use with a variety of cleaning compounds, these tank cleaners also handle most acid solutions.

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*pH Papers by **Fil-Chem***

Tridicator and narrow range pH Papers by **Fil-Chem** provide fast, accurate and reproducible results with every use. Featuring over 20 different ranges encompassing both colorimetric and electrometric values, the complete line covers the entire pH scale from 0 to 14.

Tridicator, a wide range, tri-color, range 1 to 11 pH Paper, is ideally suited for use in waste treatment processes. Because the paper and indicators used are of such high quality, results can be read to within 0.25 pH. It is available in 20 foot rolls and comes in its own plastic self-dispenser with full-color reference chart on the back.

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*The **CSC** Cenco Moisture Balance*

The CSC Cenco Moisture Balance -- the answer to trouble-free moisture measurement. Its easy operation and simultaneous weighing and drying allow for fast and accurate results. The balance displays a continuous moisture percentage reading so that no calculations need to be performed and data may be taken at anytime during a test. A percent solids value can also be read. The heat output of the infrared lamp can be controlled to optimize drying times and temperatures. Its enclosed construction eliminates errors introduced by ambient draft or moisture. This portable and rugged moisture balance can be used in any environment, from the lab to the production line and into the field.

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New Multi-Ingredient, Batch Control Indicator

Rice Lake Weighing Systems announces the availability of a new hostile environment, digital weight indicator. The Survivor^R 2012HE is designed for use in fertilizer batching, chemical plants, corrosive washdown environments and bulk weighing. The features of the Survivor^R 2012HE include: a NEMA 4X enclosure, 0.8" high intensity red LED display, parallel BCD output, 20 mA simplex output, full numeric keyboard, fully programmable setpoints and eight TTL outputs. **Rice Lake Weighing Systems'** Survivor^R 2012 HE combines versatility, dependability and flexibility in a harsh environment package.

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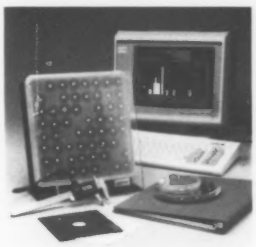

Automated Bioassay Results Zone Diameter Recording and Interpretation

Autoassay is a software program designed by **Giles Scientific Inc.** to speed the process of zone diameter measurements of all bioassay procedures. Measurements are easily input by one touch of a button on an electronic handheld caliper or keyboard directly via the RS232 serial computer port into any of several programs.

Programs include: 1) bioassays by the standard USP-FDA small standard plate method, 2) large single plage method, 3) fermentation screen x-y chart recording with automatic and custom-flagging and or inserting measurements directly into spreadsheets of 4) D Base, 5) Excel and or 6) Lotus 1-2-3. Bioassay programs offer full flexibility in terms of number of standards, replicates and unknowns and fully automate all calculations and printing of the standard curve and unknown concentrations and all raw data. Outlying points can be deleted or remeasured fast. Statistical analysis is also performed to determine the quality of results.

Autoassay programs have applicaitons in assays of antibiotics, enzymes, vitamins, monoclonal antibodies by radial-immunoprecipitation, fermentation and other screening of measurements and any assays where measurements are recorded and processed. A counting-tally function is also present.

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*A New Brochure on Stainless Steel Fittings Now Available from **Tri-Clover, Inc.***

A new brochure outlining and explaining the features, functions and applications of stainless steel fittings is now available from **Tri-Clover, Inc.**

The brochure completely represents Tri-Clamp®, Bevel Seat, Tri-Weld® and Zephyrweld® stainless steel fittings, explaining general and specific applications, product types, specifications and performance characteristics. Designed to familiarize process engineers and other end-users with these products, the brochure is the third in an educational series covering **Tri-Clover, Inc.'s** major product lines.

Please circle No. 261
on your Reader Service Card

***PMS** Automatic Parenteral Sampling System, Model APSS-100*

Designed to meet or exceed the requirements of USP 21 <788>, as well as proposed SAE, NFPA, and NAS calibration specifications and liquid cleanliness definitions. The APSS-100 system can analyze samples smaller than 1 ml or as large as desired by automatically sampling multiple syringe volumes. Syringe volumes of 1, 5, 10, and 25 ml are available. The complete sampling system consits of a Syringe Operated Particle Sampler (SOPS-100), a laser-based extinction sensor, and a Micro LPS-SST data system.

The Software Settable Threshold (SS1) calibration procedure is a flexible twenty minute procedure which automatically adjusts the calibration curve and determines the individual thresholds for the volumetri cextinction sensor. Any or all of the calibration thresholds of 2, 5, 10, 20, 30, and 70 microns can be used during the SST procedure. After calibration, the system will size and count particles in a wide dynamic range from 2-125 microns.

Please circle No. 262
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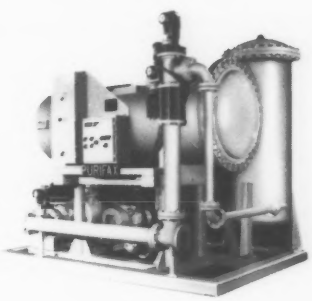

*Sludge Stabilization Process is Now Available from **Leeds & Northrup***

Purifax®, a compact, completely enclosed system, is a wet chemical oxidation process for stabilizing and disinfecting sludge from a variety of sources including septic tanks, primary clarifiers and digesters (aerobic or anaerobic). Stabilization is achieved by oxidizing the sludge so bacteria cannot thrive and support aerobic or anaerobic growth.

The Purifax-produced sludge cannot reputresce and can be a welcome landfill material.

The all-chemical process is not affected by contaminants which can upset biological treatment processes. Unlike digesters, Purifax can be started and stopped quickly -- assuring maximum efficiency and flexibility in new or existing plant operation.

Please circle No. 263
on your Reader Service Card

Varian's new Model 3410 High Temperature Gas Chromatograph operates at up to 500°C, and is suited for petrochemical, food processing, and bioresearch applications.

Separation of Lipids by High Temperature GC

The **Varian** 3410 Gas Chromatograph (GC) is specially designed to operate up to 500 C. It is ideally suited for analysis of triglycerides and high-molecular weight waxes, common components in fats and oils. The Model 3410 offers a degree of system integration and automation found in no other high-temperature GC. Based on **Varian's** field-proven 3400 GC, the 3410 incorporates newly developed software, and a number of specially fabricated parts and valving assemblies that maximize reliable operation at high temperatures. These features enable the user to program the column oven and flame ionization detector (FID) to 500 C. Pneumatics with thermostat control allow excellent retention time reproducibility, even under extreme operating conditions.

A key component of the 3410 High Temperature GC is Varian's cryo-focussing septum-equipped programmable injector (SPI) that enhances quantitative analysis. With the SPI, samples are introduced as liquids into an inert environment within the glass-lined, cold injector. In this manner, samples are treated gently, a key consideration when working with labile compounds common to food processing applications.

Please circle No. 264
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***Gundle's** Eight Tank Drawings Allow Above and Below Ground Applications*

Gundle Lining Systems, Houston, Texas, the world leader in lining systems, now offers eight detailed tank drawings featuring High Density Polyethylene liners for both above ground and below ground tank applications. Each of the eight drawings is accompanied by explanations describing the process for secondary containment.

Please circle No. 265
on your Reader Service Card

Germbusters

An array of products designed to teach children the importance of handwashing in preventing infectious disease is available from **Brevis Corp.**

Several educational kits are available in a variety of packages to meet your specific needs. Key teaching aids include a puppet set with sock puppets *Bugsy Bug* and *Sudsy Soap*, theatre backdrop, *Looking for a Home* show script and audiocassette. Also features is a Handwashing Activity Book containing instructional puzzles, projects and word problems. Glo-Germ (fluorescent germ) products and accompanying UV-lamp demonstrate proper handwashing techniques. Additional items of interest are *Bug* cartoon cards and posters, *Wash* cards, card hangers, coloring sheets, balloons to color, assorted buttons, stickers, and T-shirts.

Please circle No. 266
on your Reader Service Card

Decision Free Spill Clean Up with SorbaSet™ Absorbent/ Solidifier Guaranteed RCRA Legal

SorbaSet™ Spill Pillows represents the ultimate solution in spill pickup and disposal. Turns, spills into a solid. SorbaSet™ Spill Pillows will absorb acids, caustics, solvents and other liquid wastes both fast and effectively. The Pillow material will then harden and solidify the absorbed liquid spill. The solidification process reduces flammability, corrosivity, reactivity and toxicity of the liquid. Acids are actually neutralized. The solidified spill contained in the pillow meets current EPA (RCRA) requirements for land burial of hazardous wastes. Ensures 100% liquid retention. SorbaSet™ Spill Pillows come in two different sizes based upon absorbing capacity. The 250 ml Pillow is 7"L x 4"W and the 1 liter boom is 36"L x 4"W. Each pillow is poly bagged.

Please circle No. 267
on your Reader Service Card

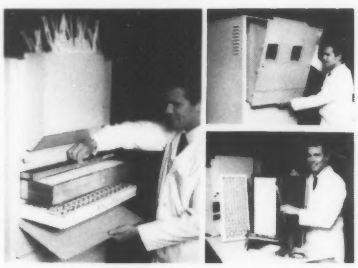
Scottcloth® Heavy Duty Wipers Replace Shop Towels and Rags

Scottcloth® heavy duty wipers from **Scott Paper Company** combine the strength and absorbency of cloth with the economy and convenience of a disposable.

These heavy duty wipers have the extra strength and durability needed to handle a wide variety of applications in the workplace. They can stand up to the scrubbing required to remove stubborn dirt and grime and they're ideal for cleaning solvents and greases from machinery, metal parts, and other equipment. They can be used anywhere rags and rental towels are used.

Scottcloth wipers are manufactured from a process that combines a highly absorbent cellulose base with textile fibers that are placed in a reinforcing matrix for strength. They're so strong that they can be used, wrung-out, and reused several times without losing strength or absorbency.

Please circle No. 268
on your Reader Service Card



Bio/Chek Air Filtering System (Pat. Applied For)

The new Bio/Chek Air Filtering System for Pollution Packer Waste Compactors incorporates the latest advances in air filtration technology, to produce higher standards of hygiene and sanitation in the compaction and storage of health care and food service wastes; up to 99.995% efficiency in trapping micro-organisms and particulates is produced.

The Bio/Chek features a three-stage air filter design with dual two-stage squirrel cage air exhaust fans that maintain a negative air pressure inside the compaction chamber, exhausting the air up through the air filters; this design obviates the "aerosol effect" that has been assumed when the bagfuls of wastes are crushed and ruptured during the compaction cycles.

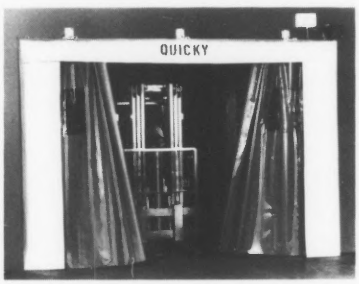
Please circle No. 269
on your Reader Service Card

MPN "Starter Kit" Enables On-Site Coliform Analysis

The Colilert pre-dispensed MPN "Starter Kit" from **Access Analytical Systems** enables small facilities, plants, and laboratories to perform accurate yet inexpensive coliform analysis at their own site. The Starter Kit provides all materials and equipment needed to perform coliform testing -- an incubator, pocket fluorescence U.V. light, water collection bags, rack disposable transfer pipettes, reaction vessels and 1 box of pre-dispensed reagent for twenty 5-tube tests.

The Colilert pre-dispensed MPN test allows the user to simultaneously detect, identify, and confirm total coliforms and *E. Coli* in the same container, with a single inoculation. The Colilert test is completed in 24 hours or less, with less than two minutes hands-on time. Colilert provides clear, easy-to-read results, and is sensitive to one colony forming unit per 100 ml of water.

Please circle No. 270
on your Reader Service Card



New Traffic Door Combines High-Speed with Low-Maintenance User-Friendly Design

A motorized traffic door that moves traffic quicker, lasts longer and costs less than other motorized doors is offered by **Chase-Durus,** Cincinnati traffic door manufacturer.

Named "Quicky", the new high-speed industrial door opens andcloses in as little as 3 to 8 seconds (depending on door size), minimizing air loss and saving energy. Using two overlapping panels with air space between, they provide a superb air/noise barrier.

Please circle No. 271
on your Reader Service Card

Food and Environmental Hazards To Health

Cadmium and Lead Exposure Associated with Pharmaceuticals Imported from Asia - Texas

In August 1988, the Texas Department of Health (TDH) investigated illegal sales in rural west Texas of pharmaceutical drugs manufactured in Asia. These drugs, identified by TDH and Food and Drug Administration (FDA) agents as "chuifong tokuwan" (a pharmaceutical compound manufactured by the Nan Ling Pharmaceutical Company of Hong Kong), are sold in pill form. Chuifong tokuwan contains a drug combination (diazepam, indomethacin, hydrochlorothiazide, mefenamic acid, dexamethasone, lead, and cadmium) that is not approved by FDA and not legal for sale in or importation into the United States. The drugs usually were repackaged and relabeled as "The Miracle Herb--Mother Nature's Finest."

TDH tested 93 self-referred persons who had ingested the pills for exposure to lead and cadmium. Of these, 57 (61%) were female; >90% were white non-Hispanics; the mean age was 55 years. Sixty-six (71%) reported taking the pills to relieve symptoms of medical conditions such as arthralgias (51%) and other pain (headache, stiff neck, back pain [26%]). Twenty-two (24%) persons had elevated urine levels of cadmium; none had elevated levels of lead (blood lead ≥25 µg/dL). However, 39 (42%) persons had elevated urine values for retinol-binding protein (RBP), a low-molecular-weight protein indicative of renal tubular dysfunction. The mean urine cadmium level for exposed persons was 1.8 µg/mL, compared with 0.5 µg/mL for nonrandom sampling of 14 unexposed persons. In exposed persons, 22 (24%) urine samples tested for cadmium were >2.5 µg/mL, the upper limit of normal. None of the samples from unexposed persons had elevated values.

The chuifong tokuwan seized in this investigation was destroyed. The investigation is continuing.

Editorial Note: Chuifong tokuwan first appeared in the United States in 1974. Although it was banned by FDA in 1989, the drug is distributed illegally in certain parts of the United States and is sometimes sold by mail. The primary users of chuifong tokuwan in this study were long-time residents of Texas; however, use of unapproved imported drug combinations is common among recent immigrants to the United States, particularly those from Asia and Latin America. Although these products are frequently perceived as relatively harmless herbal "folk remedies," they often contain cortico- or anabolic steroids; nonsteroidal anti-inflammatory drugs (NSAIDs); prescription antibiotics, such as tetracycline and chloramphenicol; and controlled substances, such as diazepam or narcotics, and have potentially serious or fatal health effects.

Use of chuifong tokuwan may increase the body burden of cadmium and may have contributed to renal tubular dysfunction in persons using this compound. Through chronic exposure, cadmium can accumulate in certain organs, particularly the kidneys. Both cadmium and several of the prescription analgesics in chuifong tokuwan can cause renal tubular cell damage. Cadmium can adversely affect function of the proximal renal tubules; increased urinary protein excretion of low-molecular-weight proteins (e.g., RBP) is an early consequence of proximal renal tubular damage by cadmium.

In persons who were also taking other medications, the analgesic nephropathy associated with chronic use of many NSAIDs may have contributed to renal tubular dysfunction. Alternatively, increased urinary RBP values could reflect renal dysfunction related to the underlying illness (e.g., arthritis) for which many of the patients took this medication. However, adverse effects on renal function have not been reported with use of either indomethacin or mefenamic acid (the NSAIDs present in the pills analyzed), even with prolonged use.

Cadmium is a cumulative toxicant, with a biological half-life of >10 years in humans. Medical evaluation, including urine cadmium and urinary RBP values is recommended for persons who have used chuifong tokuwan. Additional renal-function evaluation should be included in the medical follow-up of persons whose urinary RBP or urine cadmium values are abnormal.

MMWR 9-8-89

Update: Aedes albopictus Infestation - United States, Mexico

Aedes albopictus, a mosquito of Asian origin, was discovered in Texas in 1985. This mosquito transmits dengue virus in Asia, and under laboratory conditions can transmit pathogenic viruses indigenous to the United States.

Surveillance for *Ae. albopictus*, in the eastern United States was initiated in 1986; by 1988, infestations had been found in 113 counties in 17 states. In 1988, the mosquito was also found in a tire in Matamoros, Mexico. This is the southernmost identification of *Ae. albopictus* in North America; however, subsequent surveys in Matamoros have not detected further evidence of infestation. Separate infestations of *Ae. albopictus*, originating from tropical Asia, have been established in four Brazilian states.

Ae. albopictus was probably introduced into the United States in used-tire casings imported from Asia. On January 1, 1988, new regulations were implemented to control the importation of used-tire casings originating in Asian countries. These regulations require that used-tire casings be clean and dry and be treated by one of three approved fumigation procedures. During 1988, 34 (0.5%) of 6533 casings examined in U.S. ports contained water - a 98% reduction from levels found in earlier surveys. During 1988, no viruses were isolated from 10,679 *Ae. albopictus* specimens from Indiana, Illinois, Tennessee, and Louisiana.

Editorial Note: The public health importance of the introduction and infestation of *Ae. albopictus* in the United States remains undetermined. The potential for *Ae. albop-*

ictus to transmit certain pathogenic arboviruses indigenous to the United States has been proven in laboratory experiments; however, disease transmission by this mosquito in natural settings has not been documented. La Crosse virus, a leading cause of childhood encephalitis in the upper and midwestern United States, is usually restricted to rural areas by the behavior of its principal vector mosquito, although the virus could extend to urban centers if carried by *Ae. albopictus*, and no case of encephalitis has been epidemiologically attributed to this mosquito.

The potential for dengue virus transmission in the United States by *Ae. albopictus* is of particular concern. The principal vector of dengue virus, *Ae. aegypti*, is prevalent throughout the Southeast but cannot overwinter in northern states. However, because *Ae. albopictus* can overwinter as far north as latitude 42 N and in summer can extend even farther north, the risk for epidemic dengue in the United States is heightened.

In suburban areas of New Orleans with abundant vegetation, *Ae. albopictus* has replaced *Ae. aegypti* and has become the principal source of mosquito complaints to the health department. *Ae. aegypti* remains dominant in urban areas where housing density is high and vegetation is sparse.

Although *Ae. albopictus* now is entrenched in the United States, continued monitoring of imported used-tire casings is needed to prevent further introductions of this mosquito and to prevent the introduction of other exotic mosquito species and Asian arboviruses. Spot surveys support the effectiveness of the new regulations regarding the importation of tires from Asia.

MMWR 6-30-89

Multiple Outbreaks of Staphylococcal Food Poisoning Caused by Canned Mushrooms

Recent outbreaks of staphylococcal foodborne disease have been associated with consumption of canned mushrooms from the People's Republic of China (PRC). These outbreaks have prompted multistate recalls of mushrooms produced by certain canneries in the PRC and a Food and Drug Administration (FDA) order to prohibit entry into the United States of all incoming shipments of institution-sized cans of mushrooms from the PRC. The following reported outbreaks in 1989 led to these actions.

Starkville, Mississippi. On February 13, 22 persons became ill with gastroenteritis several hours after eating at a university cafeteria. Symptoms included nausea, vomiting, diarrhea, and abdominal cramps. Nine persons were hospitalized. Canned mushrooms served with omelets and hamburgers were associated with illness. No deficiencies in food handling were found. Staphylococcal enterotoxin was identified in a sample of implicated mushrooms from the omelet bar and in unopened cans from the same lot.

Queens, New York. On February 28, 48 persons became ill a median of 3 hours after eating lunch in a hospital employee cafeteria. One person was hospitalized. Canned mushrooms served at the salad bar were epidemiologically implicated. Two unopened cans of mushrooms from the same lot as the implicated can contained staphylococcal enterotoxin.

McKeesport, Pennsylvania. On April 17, 12 persons became ill with gastroenteritis a median of 2 hours after eating lunch or dinner at a restaurant. Two persons were hospitalized. Canned mushrooms, consumed on pizza or with a parmigiana sauce, were associated with illness. No deficiencies were found in food preparation or storage. Staphylococcal enterotoxin was found in samples of remaining mushrooms and in unopened cans from the same lot.

Philipsburg, Pennsylvania. On April 22, 20 persons developed illness several hours after eating food from a take-out pizzeria. Four persons were hospitalized. Only pizza served with canned mushrooms was associated with illness. Staphylococcal enterotoxin was found in a sample of mushrooms from the pizzeria and in unopened cans with the same lot number.

Three other outbreaks possibly associated with mushrooms from the PRC have been reported to CDC; cans associated with these outbreaks have codes similar to those in the four confirmed outbreaks.

Editorial Note: Staphylococcal enterotoxin typically causes an acute illness 2-4 hours after ingestion; illness is characterized by severe nausea and vomiting, often accompanied by abdominal cramps, diarrhea, and low-grade fever, and resolves within 1-2 days. Staphylococcal enterotoxin is not inactivated by temperatures used in canning and cooking. Finding this toxin in cans means that staphylococci grew and produced enterotoxin in the mushrooms before canning or that staphylococci contaminated the mushrooms after canning, possibly through improperly formed seams. From 1982 to 1987, 75 confirmed staphylococcal outbreaks were reported to CDC's national foodborne disease surveillance system; none of these outbreaks were associated with deficiencies in canning.

All cans implicated in these mushroom-associated outbreaks were large institution-sized (68-ounce, drained weight [#10]) cans of pieces and stems of mushrooms produced in the PRC and shipped through Hong Kong. FDA is monitoring the voluntary recall of shipments of cans that have codes implicated in outbreaks. Cans from lots associated with illness have lids embossed with three-line codes with the plant identifiers "TM" on the first line or "T3" or "M2" on the second line. FDA is prohibiting entry into the United States of all shipments of mushrooms from the PRC in #10 cans because the source of contamination has not been identified and cans produced by other plants might also be involved. FDA has begun sampling mushrooms imported from the PRC in all can sizes, including consumer-sized cans. FDA has offered to assist the PRC in an investigation of the sources of contamination.

The United States imports approximately 50 million pounds of processed mushrooms from the PRC annually. Many other countries also import canned foods from the PRC. Since the canned mushrooms are widely distributed, other canned mushroom-associated outbreaks may have occurred. Possible outbreaks should be reported through state health departments to the Enteric Diseases Branch, Division of Bacterial Diseases, Center for Infectious Diseases, CDC (FAX: [404] 639-3296, Telex: 549571 CDC ATL).

MMWR 6-23-89

FDA Food Service Code Interpretations

Christmas is around the corner. Everyone is hoping Santa will leave them something special under the Christmas Tree. Last October during the National Association of Food Equipment Manufacturers show in Dallas, food service managers had a chance to make out their Christmas list for mailing to Santa. The NAFEM show was an extravaganza of state of the art food service equipment technology.

Hopefully, when opening their packages left under the tree, managers won't make the mistake of throwing out the operator's manual with the trash. Manuals that come with new food service equipment can be a valuable source of technical information on important sanitation procedures.

When equipment problems are noted during inspections, experienced Sanitarians will often refer to the operator's manual to diagnose the problem. Many times equipment sanitation problems are a direct result of not following the manual. Operator manuals also make excellent training aids for new employees and new Sanitarians.

No matter how well food service equipment is designed and manufactured it will sooner or later need to be replaced when it can't be maintained in a sanitary condition. In some cases it may be sooner, rather than later. During committee meetings at the IAMFES conference last August, several questions were raised on reporting equipment sanitation problems that are noted during field inspections.

One example discussed was the apparent early failure of stainless steel ice machine bins. Rusting and pitting of ice contact surfaces are being noted after only a year or so of use. Is the problem a design issue, or is the problem due to not following instructions for cleaning and sanitizing provided in the operator's manual?

The medical device and pharmaceutical industry has an established program for reporting equipment problems and failures. Apparently, a similar program for reporting and tracking problems with food service equipment doesn't exist. If any state or local health departments have such a system, let us know. IAMFES members are invited to send in comments on the need for such a program at the national level.

OFF THE CLIPBOARD: If you haven't already done so, take a few minutes to complete and send in the code interpretation survey in last month's column. If there is enough response to this survey we will publish a complete listing of FDA Interpretations.

- CDC offers two home study courses that should be required for all Sanitarians involved in food sanitation programs. "Quantity Food Sanitation" and "Microbial Ecology of Foods" provide essential information that Sanitarians need to know. Send a SASE for a description of these courses. - The Conference for Food Protection is scheduled for April 21-25, 1990. The conference is soliciting food safety issues and problems for review and discussion by expert panels. If you have issues that need to be addressed by the Conference, send them to: Conference for Food Protection, P.O. Box 1468, Ann Arbor, MI 48106.

- Test your knowledge on food microbiology and other field inspection problems by taking the Field Inspection Quiz below. Answers will be provided in next month's column.

- Don't forget to send your interpretation survey forms in. Send a self addressed and stamped envelope for information on the CDC courses and more information on the Conference on Food Protection, P.O. Box 1832, Frederick, Maryland 21701.

Homer C. Emery, RS
Chair, FDA Interpretations Committee

Field Inspection Quiz

1. Listeria and Yersinia are examples of foodborne pathogens that can be described as:

   A. Mesophiles
   B. Thermophiles
   C. Psychrophiles
   D. Hydrophiles

2. At which of the following temperatures would more bacteria be killed or injured?

   A. 5 C
   B. 0 C
   C. -2 C
   D. -30 C

3. A consumer calls in to complain that mushrooms are being sold at a local grocery store with packages containing holes. The consumer feels that the holes in the mushroom package could allow insects to enter. You should:

   A. Visit the store to correct the problem.
   B. Explain that mushrooms aren't potentially hazardous.
   C. Explain that the holes in the package help prevent the growth of bacteria that cause botulism.

4. A swimming pool operator is having problems with low pH and turbidity. You should recommend:

   A. Adding soda ash
   B. Adding lime
   C. Adding sodium hydroxide

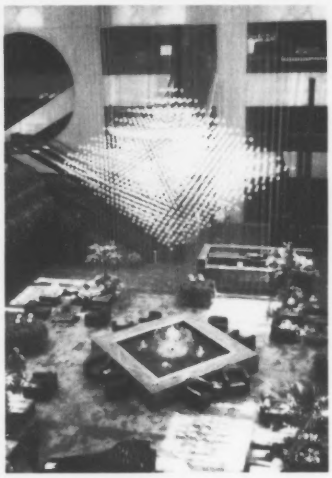
5. A water pollution control plant operator has asked you about BAT. You should reply:

   A. Avoid them since they carry rabies.
   B. It stands for Best Available Technology.
   C. It stands for Biological Activated Treatment.
   D. It stands for Biochemical Advanced Techniques.

76TH IAMFES ANNUAL MEETING REPORT

(L to R) From the Ames. IA office, Margie Marble, Dee Buske, Julie Heim, and Sandy Engelman, standing in front of the IAMFES exhibit during the Cheese and Wine Reception on Sunday night.

Scott Wells, IAMFES Advertiser Manager, at the President's Reception.



The lobby of the Hyatt Regency Crown Center.

(L to R) Ivan Parkin and Roy Ginn.

Kansas Local Arrangements.

(L to R) Mary and Steve Halstead

Elmer Marth, Michael Doyle and Annette Doyle

IAMFES Executive Board, Vice President, Bob Sanders; Affiliate Council, Bill Coleman; Executive Mgr., Steve Halstead; Secretary, Damien Gabis; Pres. Elect, Ron Case; Past Pres., Leon Townsend and President Bob Gravani.

Combine three outstanding days of educational sessions, networking with colleagues, seeing old friends and making new ones, table top exhibits, social events, committee meetings, along with all the people involved and you have another successful IAMFES Annual Meeting.

Attendance was once again over 700 at the beautiful facilities of the Hyatt Regency Crown Center, August 13-17 in Kansas City, Missouri.

The following is a summary of the 76th IAMFES Annual Meeting. If you weren't able to attend, plan now for the 77th in Chicago, Illinois, August 5-9, 1990. All meeting and hotel registration forms will be in the February issue of both journals. Look for the Preliminary Program in the spring issues! If you haven't submitted an abstract for your presentation at the Chicago meeting, check your October issue for the blue Abstract forms. Deadline for abstracts is January 1, 1990.

A special thanks goes out to the Kansas Local Arrangements, the IAMFES Board, the Program Committee and the Ames Office for all of their hard work and devotion. The meeting was a great success.

See you in Chicago!

"The Status of our Association"

R. B. Gravani, President

The 1989 IAMFES Presidential Address
Presented by Robert B. Gravani at the
76th Annual Meeting in Kansas City, MO
on August 15, 1989

I would like to provide all IAMFES members with a report on the current status of our association.

Association Management

This year has been a very productive but slightly unusual one in that our Executive Manager, Kathy Hathaway, resigned and moved to Clinton, Ohio. Your Executive Board then began a search for a new Executive Manager. We received 65 applications for the position and carefully screened all of them.

After interviewing five qualified candidates in Ames, the Board discussed the merits of each of these individuals and chose Mr. Steven K. Halstead as the new Executive Manager of IAMFES.

Let me tell you a little bit about Steven's background. He is a native of Iowa and has a B.S. degree in science and an M.S. in physics from the University of Northern Iowa. He spent the first part of his career in the field of education as a math and science teacher at the junior high, high school, college and adult level. He was also an educational consultant for the Iowa Department of Education and an administrator for the Des Moines Area Community College.

In 1982, he became interested in association management. Steve served as Executive Director for the Iowa Funeral Directors Association and later as the Executive Assistant for the Iowa Dental Association. He has been actively involved in budgeting and financial management, the publication of journals and newsletters, staff supervision, planning and conducting annual meetings, and marketing and advertising. As you can see, Steve is highly qualified for the job.

He has a pleasant personality, good interpersonal skills and will do an excellent job for our association.

We are pleased to have Steve as our new Executive Manager and look forward to a long and productive relationship. I hope that you will join the Executive Board in welcoming Steve to IAMFES and assist him as he learns about our association.

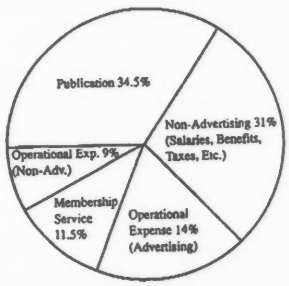
During the two months between Executive Managers, Ms. Margie Marble did an outstanding job in serving as acting Executive Manager. She, along with the entire Ames office staff (Sandy Engelman, Scott Wells, Julie Heim, Dolores Taylor and Dee Buske), deserve a sincere "thank you very much" for operating the office and handling the annual meeting registration very efficiently and effectively. They are a truly great team!

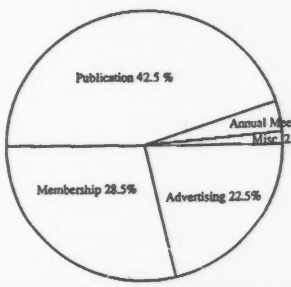
1988-89 Financial Summary

Finances are always an important area of concern. For the 1988-89 fiscal year, the association had a total income of $638,159 which came from sources shown below in the Total Income pie chart.

The total expenses for the same time were $666,573. Monies were spent in the categories shown in the Total Expenses pie chart below.

1988-89
Total Expenses =
$666,573





1988-89
Total Income =
$638,159

As you can see, there was a $28,414 deficit. Our cash flow has been very good, but we have dipped into our reserves to cover expenses. Obviously, this practice must be turned around if we are going to accumulate a reserve for office

automation and special projects. One area that is being explored for additional revenue is non-dues income. This category must increase in the future.

Annual Meeting

The 76th Annual Meeting in Kansas City, MO was hosted by the Kansas Affiliate. Local Arrangements Chairman, Don Bechtel and his colleagues planned, organized and coordinated all of the logistics for the meeting and made the 735 attendees feel right at home. Don and all his dedicated staff deserve a special thank you for their hard work and their contributions to a very successful conference. The meeting featured 123 presentations in a variety of food and environmental technical sessions and symposia. President-Elect Ron Case, Dr. Ed Zottola and all the members of the program advisory committee should be congratulated for the fine job they did in arranging the program. There were 15 graduate students representing 8 different universities entered in the Developing Scientist Competition. In addition, 66 companies exhibited their materials, equipment or services at our annual meeting.

As always, the success of a meeting is measured by the scientific quality of the program, participation by the membership, the special activities, and the food and accommodations. Judging from these criteria, I think that the 76th Annual Meeting was a huge success!

Association Membership

As of August 4, 1989, membership in IAMFES is as follows:

• Direct Members	3,118
• Subscriptions	1,387
• Sustaining Members	78
	4,584

There are scientists, sanitarians, quality assurance professionals, environmental health experts and many other professionals working in food protection and environmental health who should be members of our association. In the year ahead, we need to contact these individuals, make them aware of IAMFES and its objectives and then enlist them as active members. This is one of the most important ways that our organization will grow and prosper. We need your help in identifying people who should be contacted regarding membership in IAMFES.

Member Services

Our most visible member services are our two outstanding journals which are widely circulated and read around the world. Our technical editors, Dr. Lloyd Bullerman of the *Journal of Food Protection* and Dr. Henry Atherton of the *Dairy, Food and Environmental Sanitation* have done a fine job of producing high quality publications. I also want to thank all of our authors for submitting their manuscripts to our journals. Their excellent papers make our publications very highly regarded by food protection professionals. Special thanks are also in order for Dr. Bob Marshall and Harold Bengsch and their journal management committees for their continued interest in and support of our outstanding journals.

Our audio visual library is another very popular member service. In the last year there have been 228 requests for the 34 visuals in the library. The Foundation Fund, through the support of our sustaining members, commissioned the development of the library several years ago, and it has been a huge success. Dr. David McSwane of Indiana University is the Chairman of the Audio Visual Library Committee. He and his committee have done an excellent job of reviewing and selecting visual training aids. Please don't hesitate to contact Dr. McSwane if you know of any materials that should be reviewed for inclusion in the library.

Steve Halstead will be designing and coordinating a member needs survey during the next fiscal year. Please take time to complete this survey and let the IAMFES Board know how the organization can serve you better.

Affiliates

There are presently 28 domestic affiliates, 2 international affiliates and one new affiliate that will receive its charter during this Annual Meeting. The Massachusetts Milk, Food and Environmental Association is the newest member of the IAMFES family, and we all wish them well as they begin their affiliation with us.

One of the Executive Board goals this past year was to improve communication and services to our affiliates. This has begun with the restructuring of the election procedures for the IAMFES Council of Affiliates officers. There will also be an affiliate needs survey conducted by the Ames office to further assess what can be done to assist our affiliates.

Steve Halstead and Executive Board members will be attending several affiliate annual meetings in the year ahead to meet and visit with officers and local members.

Committee Activities

There are currently 21 IAMFES committees that are functioning well and addressing key issues in food safety, sanitation and food protection.

I want to personally thank all of the committee chairs and committee members for the time and effort that they have contributed during the past year. Our committees are getting stronger and more active each year. We are slowly moving toward rotating committee chairs as well as committee members to assure every member an opportunity to serve the association.

Food Safety Activities

IAMFES has been quite active in food safety initiatives in the last year. Your association actively participated in an Institute of Food Technologists (IFT) conference called "Assessing the Optimal System for Ensuring Food Safety: A Scientific Consensus."

Delegates from eighteen scientific societies (IAMFES sent three delegates) whose areas of interest include food safety, gathered in Washington, DC to discuss food safety issues. The meeting was organized because of a broad scientific concern that the risks associated with the American food supply are not being accurately communicated to consumers.

Five key interest areas such as:

- Microbiological Hazards
- Environmental Contaminants
- Naturally Occurring Toxicants
- Pesticide Residues
- Food and Feed Additives

were examined and discussed by working groups of delegates. Specific recommendations were given for each area and a report summarizing these findings was generated. This report was then distributed to decision makers in the U.S. Congress, administrators of regulatory agencies responsible for food safety, and the media.

An executive summary as well as a summary of recommendations of the food safety workshop will be reported in a future issue of this journal.

In addition, IAMFES, through the *Journal of Food Protection* is sponsoring a symposium at the Dairy and Food Expo conducted by the Dairy and Food Industry Supply Association. The Expo will take place on November 11-15, 1989 at McCormick Place East in Chicago, Illinois. Our symposium, entitled "Coping with Food Safety Issues in the '90's" is scheduled for Monday, November 13th from 9:00 - 10:30 a.m. It will feature distinguished industry speakers including Douglas R. Engebretson, Land-O-Lakes; David R. Henning, Kraft General Foods; and Dennis R. Heldman, National Food Processors Association. These experts will address key safety issues and provide strategies to successfully cope with them.

By participating in these functions, IAMFES gets widespread visibility and attracts the attention of people with interests in food protection. I hope that the Executive Board will continue to seek opportunities to "publicize" IAMFES's role in food protection and to be more proactive and involved in food safety issues programming.

Moving into the '90's

IAMFES has very effectively served the field of food sanitation as well as the dairy industry and parts of the food industry in its 76 years. In the future, the organization needs to continue to attract qualified individuals in other areas of the industry. People from a broad spectrum of disciplines including those with interests in:

- quality assurance and quality control,
- environmental health and safety,
- pesticides and toxicology,
- risk analysis and risk communication,
- food microbiology,
- food science,

and many others need to be actively recruited for membership. Two categories that need special recruiting efforts are students and local, state and federal regulatory agency officials.

If IAMFES is to continue to grow and prosper, several things need to occur. We need:

- an increase in membership,
- increased member services,
- increased educational efforts,
- greater contact with affiliates,
- increased visibility in the field of food protection,
- a stronger association.

It has been a privilege to serve as your President during 1988-89. I want to thank my colleagues and friends on the Executive Board for their advice, support and friendship during my term as President. Your Board Members have contributed a great deal of their time and talents in the past year to strengthen the association. Special thanks to all of the involved and active IAMFES members who have made my job during the last year a very pleasant and rewarding experience.

Arthur Koestler said "The principle mark of genius is not perfection but originality, the opening of new frontiers."

I hope that as we approach the '90's, IAMFES opens many new frontiers with all members contributing to this important goal. If we can accomplish this task, then IAMFES will be the premier food protection association in the United States!

Committee Reports

If you wish to serve on a committee, please contact this office so that we may put you in contact with the committee chairperson. 800-525-5223 or 515-232-6699.

Affiliate Council Meeting
August 13, 1989
Kansas City, Missouri

Secretary's Report

Chairperson, Bill Coleman, Minn., called the meeting to order at 2:00 p.m. Twenty-three of the 31 Affiliates were represented. Also present were members of the IAMFES Executive Board, Personnel from the IAMFES Ames, Iowa, office and guests.

Minutes from the 1988 Affiliate Council meeting were approved as distributed.

Executive Board Report

President Bob Gravani welcomed the Affiliate Council and guests to the annual meeting. He also encouraged everyone to give comments and suggestions to the Board.

Bill Coleman reported that Kathy Hathaway had resigned as Executive Manager and that Steve Halstead had been hired to replace Kathy.

Margaret Marble, who served as Interim Executive Manager, explained that all pre-registration was handled through the Ames office. This procedure went smoothly and will probably be continued for future meetings.

Steve Halstead expressed an interest in working closely with the various Affiliates to learn how IAMFES can help to strengthen the organization.

Old Business

Bill Coleman reported that there are now 31 Affiliates, however, Connecticut, Idaho, Mississippi and Wyoming have less than 10 affiliate members. These four need to increase their affiliate membership to 10 or more by the next annual meeting to maintain their membership in the Affiliate Council. Members of IAMFES who are not affiliate members do not count as part of the necessary 10.

Further discussion emphasized that State Affiliates, who handle their own affiliate membership dues have a responsibility to send their membership numbers and names to the Ames office.

New Business

Massachusetts will become a new Affiliate this year. Arizona, New Jersey and Utah are interested in becoming Affiliates.

Margaret Marble reported that the number of requests to use materials from the Audio-Visual Library had increased the past year. A card is filled out when a request is received and the request is filled as soon as possible. A waiting period had existed for some of the more popular materials. Current policy allows the users to have the materials for two weeks. Abuse of this policy has led to the suggestion of requiring a deposit fee that will be partially retained if borrowed materials are not promptly returned. The Executive Board has allocated money to prepare additional copies of the more popular materials and to purchase new materials.

Affiliate council meeting.

Chairperson Bill Coleman discussed the need to improve the current method of electing the Affiliate Council President and Secretary. After considerable debate the following procedure was voted on and adopted by the Council.

Council President will appoint a Nominating Committee that will do the following:

A. Will contact each Affiliate and encourage them to submit a nomination for each office.
B. Committee will screen nominated candidates and determine if they will serve if elected.
C. Committee will recommend two candidates for each position.
D. All Affiliates will be contacted and asked to vote prior to the annual meeting.
E. In case of a tie the Executive Board shall determine the winner.
F. The elected Affiliate Council Chairperson and Secretary will be introduced at the annual meeting of the Affiliate Council held in conjunction with the annual meeting of IAMFES and will take office at the same time as the new IAMFES officers.
G. The maximum term for an Affiliate Council Chairperson or Secretary shall be three consecutive years.

Reports From Affiliates

Each Affiliate delegate gave a brief report of the ac-

tivities and status of their Affiliate. Several similarities were noted in those with an active membership:

A. Have one or two meetings per year. Consider utilizing a theme for each meeting.
B. Combine meetings with other groups that have similar interests (IFT, Public Health Assoc., Environmental Health, etc.)
C. Publish a newsletter.
D. Make an effort to contact International members who are not members of the local Affiliate.
E. Several Affiliates have increased their efforts to obtain student members.
F. Establish and support scholarship programs.

Adjournment

Prior to adjournment President Bill Coleman asked the delegates to consider the idea of giving an award to the State Affiliate that submits the best paper published in the Journal. This idea will be discussed at a future meeting.

Meeting adjourned at 4:30 p.m.

Applied Laboratory Methods Committee Annual Meeting Highlights
August 16, 1989
Kansas City, Missouri

1. 32 Attendees (26 last year)
   - Circulation of membership list to validate/update information.
   - Attempt to identify individual areas of expertise to assist in program networking.
2. Committee Goals and Objectives Reviewed
   a. Stimulate and encourage method development
   b. Identify methods, related problems and encourage resolution through comparative study
   c. Ensure validity of method studies
   d. Establish listing of experts for information networking
   e. Provide resource group for methods studies review and publication
3. Achievements in 1988
   a. Enhanced status and recognition of Lab Methods Committee by IAMFES
   b. Publication of Rapid Methods and Automation in Analytical Food Microbiology, Dr. Fung
   c. Publication of PI Count in Pasteurized Products - Dr. J. Bishop
   d. Report recommending devices to replace mouth pipetting for incorporation in standard methods - Dairy
4. Projects/Problems
   a. Effect of prolonged incubation of LST & BGLB on Coliform MPN - Study completed
   b. Method for coliforms in glycols or sweet water - completed
   c. Illegal antibiotics in livestock - detection problems appear to be resolved
   d. Effectiveness of udder washes - no acceptable method to evaluate (AOAC method withdrawn)
   e. Differentiation of non-ß-lactam inhibitors - resolved by using higher concentration of liquid penicillinase
   f. High level of false positive inhibitors in goat's milk - resolved by heating
   g. Standard methods for meat microbiology - AOAC will address specific concerns
   h. California Milk Component Testing Infrared Instrument Calibration Accuracy Monitoring Program - Report prepared and circulated for comment by Committee
   i. Comparison of Optical Somatic Cell Method and the Direct Microscopic Somatic Cell Count from Raw Goat Milk Samples - Preliminary report submitted, study continuing
5. New Problems/Projects
   a. Sulphur residues in eggs - not considered significant at this time
   b. NCIMS recommendation to change coliform detectional reporting limits to ≤1/g(ml) rejected
   c. Study initiated to evaluate inoculation-refrigeration-incubation to alleviate weekend lab work - 9 laboratories participating
   d. Improved liaison with AOAC and other methods standardization organizations to enhance IAMFES methods studies
   e. Need for expansion of audio-visual library
   f. Need to offer basic methods workshops as FDA no longer able to meet needs
   g. Increase awareness of IAMFES members that the Laboratory Methods Committee is an excellent forum for discussing and resolving problems with analytical methods
6. Committee Administrative Structure - 1990
   a. F. Ann Draughon elected 2nd Vice-Chairperson
   b. J. (Rusty) Bishop becomes Chairperson
   c. Michael H. Brodsky becomes 1st Vice-Chairperson
   d. Helen Carr becomes immediate Past-Chairperson -

Special Thanks
Prepared by
Michael H. Brodsky

Applied Laboratory Methods Committee Report to the IAMFES BOARD

The meeting of the Applied Laboratory Methods Committee was held on August 13, 1989. Thirty-two members were in attendance. The meeting was chaired by Rusty Bishop.

During the past year when this committee was finally again a "recognized," functioning committee, four projects were concluded:

1. A paper entitles "Rapid Methods and Automation in the Microbiological Examination of Foods" by Dan Fund was published in *Dairy, Food and Environmental Sanitation.*
2. A paper entitled "The Preliminary Incubation Count - Is It Good Enough?" by Rusty Bishop was published in *Dairy, Food and Environmental Sanitation.*
3. Alternative methods to mouth pipesetting were requested by Ron Case for inclusion into the upcoming *Standard Methods for the Examination of Dairy Products* and supplied to Bob Marshall by Michael Brodsky.

Eight current projects were reported on and are at varying stages of completion. These are in the areas of extended incubation for coliform MPN confirmation, methods for testing glycol of "indicator" organism, illegal drugs in livestock, effectiveness of penicillinase products, udder-wash efficacies against environmental pathogens, false positive halos when testing for antibiotic residues on goat milk, standardization of methods for meat microbiology, milk component testing, and somatic cell counts in goat milk.

New Problems presented were:

1. In an attempt to alleviate weekend lab work, inoculate media/refrigerate/incubate scheme has been proposed which aids determination of colony appearance vs. presence.
2. Possible changes in coliform specifications are testing methods.

The committee favors the appointment of Rusty Bishop as Chairperson, Michael Brodsky as 1st Vice-Chairperson, and Ann Draughon as 2nd Vice-Chairperson.

The goals of the committee were more than adequately met. This is evidenced by the completion and continuation of twelve (12) projects. The tremendous participation of the committee becomes obvious when considering the voluntary participation of 9 collaboratories for the study concerning inoculation/refrigeration/incubation.

Respectfully submitted,
J. Russell Bishop
Chairperson-elect

Annual Report
Journal Management Committee
Journal of Food Protection
1988-89

The major activity of the Journal Management Committee in 21988-89 has been work with Scientific Editor Bullerman, President Gravani, and Executive Director Hathaway to complete the transition of editorial operations.

Early in the year there were problems in keeping the pipeline of manuscripts flowing consistently to the printer. This was reflected in an approximate 10% reduction in pages in the first 6 issues of Volume 52 (1989) compared with Volume 51, and of about 15% compared with Volume 50.

The Committee Chair visited the Scientific Editor in April, 1989. The system of receiving, logging, filing, selecting reviewers, and communicating with authors appeared to be well organized and operated. However, there appeared to be less than optimal control in the post-review process. Having the Copy Editor in a remote location and under supervision of the Managing Editor could produce inefficiencies.

The JFP Committee Chair and Scientific Editor discussed having copy editing done at Lincoln, NE, and interviewed Grace Sobotka, a candidate for the position. They also discussed possibilities of having an Associate Scientific Editor.

Subsequently, Editor Bullerman contacted Dr. Steve Taylor, Chair of Food Science and Technology to serve as Associate Scientific Editor. Dr. Taylor, a well-known food toxicologist, would add stature to the journal by association. His time is limited and he would be available only to direct the office in the absence of Bullerman.

Editor Bullerman suggested hiring of his Research Associate, who has an M.S. degree in Food Science, as Editorial Assistant at about $200/month. Bullerman would turn over much of the routine responsibilities to this person and would have the editorial operations computerized.

In addition, Editor Bullerman requested permission to move the copy editing function to Lincoln, NE, and to have $500/month allocated for that purpose.

The JFP Management Committee recommended to the Executive Board that (1) Editor Bullerman be paid $500/month, (2) he be permitted to hire a Copy Editor in Lincoln, NE at $500/month, (3) he be allocated $200/month for an Editorial Assistant, (4) Dr. Steve Taylor be named Associate Scientific Editor without stipend, and (5) long distance charges and costs of copying in the editorial office be paid by IAMFES.

Respectfully submitted
Robert Marshall, Chair

Dairy, Food and Environmental Sanitation Journal Management Committee Meeting.

Dairy, Food and Environmental Sanitation Journal Management Committee

August 15, 1989

Annual Report

The Management Committee met Saturday, August 12, 1989. The committee reviewed the progress of the Journal in its implementation of major revisions promulgated at last year's meeting.

Currently, the Journal is averaging over 60 pages per issue with approximately 4 articles per issue. Current subscription stands at 3514.

The committee felt that with the good acceptance of the new format and so few reader suggestions for change and/or complaints, we would make no recommended change in format for next year cycle.

The committee does, however, wish to make the following recommendations:

1. If possible add an additional article per each publication. This would raise the current number of 4 to 5.

   This recommendation is in keeping with the Journal mission statement No. 2 which states: "Solicit timely articles from our membership."

   Currently, we have a backlog of unpublished articles for approximately 3 months. This is an insufficient number to accommodate that request. In an effort to stimulate additional articles, we offer the following suggestions.

A. The affiliate council is requested to promote through its affiliates, articles for publication.
B. It is further suggested that the State affiliates develop an award for those members who contribute a published article.
C. In turn, we request the affiliate council develop a review committee to select from those published affiliate articles, an author to be recognized at the Annual IAMFES Meeting for the outstanding affiliate contribution.

2. We request affiliates to submit short articles on "members in the news" type accomplishments, for publication in the Journal.
3. We suggest that the Ames office and FDA explore the feasibility of publishing "Coded Memoranda" affecting both Milk and Food, in the Journal of Dairy, Food and Environmental Sanitation.
4. We recommend the Ames office develop a photo contest from our membership for cover photos for the Journal.

Finally, the committee wishes to convey our appreciation to the Ames staff and particularly Margie Marble for the implementation of last year's major changes in the Journal. It was a large order and one that was largely well done.

Respectfully submitted,
Dairy, Food and Environmental Sanitation
Journal Management Committee
Harold Bengsch, Chairman

Committee Chairperson's Breakfast

Retail Food Committee Report

The meeting of the Retail Food Committee was held on Sunday and attended by nine people. The Committee discussed, in general, some of the public health concerns associated with retail stores - specifically vacuum-packaging, refrigerated foods and in-store smokehouse operations. We endorsed the Food Service committee's recommendation that a vacuum-packaging program be encouraged for next year's annual meeting. Because the participants in the Food Service, Retail Food, Code Interpretations and Food Equipment Standards committees were nearly identical, the four committee chairs agreed to recommend a consolidation into one Food Committee with appropriate subcommittees as needed.

Thomas L. Schwarz
Chair, Retail Foods Committee

IAMFES Audio Visual Library Committee 1988-89 Annual Report

Committee Members:
David McSwane, H.S.D., Chairman, Bob Darrah, Charles Felix, Tom Gilmore, Harry Haverland, and Marsha Robbins

The key functions of the IAMFES audio visual library committee are solicitation of new materials for addition to the library and review of materials for accuracy and appropriateness prior to purchase.

During the past year the A.V. Committee focused its efforts toward acquiring educational materials that dealt with food safety, sanitation and general environmental health issues. The members of the committee believed the library already contained several excellent films and slides that addressed the various aspects of milk production and processing, and it was agreed that materials addressing the areas previously noted were more urgently needed.

To insure greater availability of materials through the lending library, the committee recommended that two copies of the following videos be purchased as soon as possible:

1. Food Safety is No Mystery
2. Safe Handwashing
3. 100 Degrees of Doom
4. RCRA - Hazardous Materials
5. Asbestos Awareness
6. The Food Safe Series - Part I
   Microbiology
   Receiving and Storing
   Housekeeping and Pest Control
   Facilities and Equipment
7. The Food Safe Series - Part II
   Salmonella - Eggs
   Staphylococcus Aureus in Sauces
   Clostridium Botulinum
   Campylobacter
8. Pest Control in Seafood Processing Plants
9. Sanitation for Seafood Processing Personnel
10. Cleaning and Sanitizing
11. Diet, Nutrition and Cancer

Several of these video tapes have already been added to the library, and others will be added during the year ahead.

The Committee urges all IAMFES members to use the video tapes and other training materials available from the lending library. The Committee will continue to seek out and review new materials for addition to the library, and members can assist in this process by notifying a committee member or Sandy Engelman at headquarters when they find educational materials (both print and a.v.) that would be appropriate for the library.

Respectfully submitted,
David Z. McSwane

Mr. and Mrs. Leon Townsend and Mr. and Mrs. Harry Haverland.

Foundation Fund Committee Report 1989

The Foundation Fund is an entity within IAMFES managed by a Committee of at least four (4) individuals in which one (1) must be a member of the IAMFES Executive Board. Currently, the Committee consists of Mr. Robert Sanders, IAMFES Executive Board representative; Dr. Robert Marshall; Messrs. James Reeder, Earl Wright and Harry Haverland. Ms. Dolores Taylor is the Committee's contact in the business office. The Committee meets during the Annual Meeting. However, most of the Committee's activities are carried out through correspondence and telephone conversations. Foundation funds are maintained in a separate account. Expenditure of funds is the responsibility of the Committee. As of May 16, 1989 the Foundation Fund balance was $41,319.13. One hundred (100) dollars is placed in the Foundation Fund each time a Sustaining Member joins or renews their annual membership. As of August 1, 1989 there were seventy-eight (78) Sustaining Members. A list of these members is published in the Journal(s) you receive. The Sustaining Members are our friends and supporters of IAMFES objectives.

The Foundation Fund supports the following activities:

A. The Ivan Parkin Lectureship.
B. Developing Scientist Awards.
C. The Lending Library.
D. Video Taping of Selected Presentations at the Annual Meetings.

Report of Activities:

A. Assisted in revising the Sustaining Membership Brochure. The brochure was expanded to include memorials and Contributions. Cost of project $262.44.
B. In response to a request from the Executive Board, the Committee raised the Ivan Parkin Lectureship from $500 to $1000.
C. Worked with Dr. David McSwane, Chairman, Library Committee, in reviewing and selecting training materials for the library. Greater emphasis was placed on adding materials in the area of food safety and environmental health.

Expended $6781.18.
Respectfully submitted
Harry Haverland, Chairman

Annual Report of the IAMFES BISSC Committee

In an effort to eliminate major sanitation problems attributed to improper design, the Baking Industry Sanitation Standards Committee (BISSC) was founded in 1949.

In addition to industry support, BISSC sought advisory assistance from Public Health Agencies and Associations. IAMFES responded to the BISSC request for advisory assistance by creating a Standing Committee to work with BISSC. This IAMFES Committee has participated in all meetings of BISSC since its inception in 1949, including the 74th meeting in 1989.

In 1966, the BISSC Board of Directors established the Office of Certification which permitted the Registration of Equipment manufactured in accordance with the BISSC Construction Standards and formulated the Equipment Authorization System whereby equipment meeting the requirements of the standards could be authorized to display the BISSC symbol.

The IAMFES BISSC Committee Chairman was selected to serve as a Consultant to the Office of Certification and has served in that capacity since the establishment of the Office.

The 1989 Winter Meeting of BISSC was held at the Chicago Marriott Hotel at which time the Board of Directors adopted a new program of surveillance formulated to randomly review equipment, displaying the BISSC Seal of Approval, to determine if the equipment, in fact, meets the requirements of the applicable BISSC Standard.

The responsibility of implementing this program was delegated to the Office of Certification, and I, as ranking Sanitation Consultant, was requested to conduct the initial reviews and evaluations of such equipment at the 1989 Dairy Expo in Las Vegas, Nevada in September.

A BISSC video tape presentation is available, without charge, to members of IAMFES upon request. The video tape, copies of all Standards and information booklets are available through the BISSC office from:

Ms. Bonnie Sweetman, Administrator
Baking Industry Sanitary Standards Committee
111 E. Wacker Drive
Chicago, IL 60611

We recommend that members of IAMFES acquire a set of BISSC Standards and adopt them as guidelines and subscribe to the principles of the BISSC Criteria.

The 1990 BISSC Meeting will be held at the Chicago Marriott Hotel in March. The exact date will be published in all major trade journals later this year.

Respectfully submitted
Martyn A. Ronge, Chairman

Food Service Sanitation Committee

Mission Statement:

This IAMFES Committee works to assist the Public Health Sanitarian and Food Service Operator to effectively address food safety involving food service and sanitation issues to protect the customer's health.

Key Activities:

Temporary Food Service Sub-Committee: Update by Charles Otto, chairman, who advises that the survey information is in and has been processed. A draft of a proposed pamphlet for regulatory use will be available for review in mid-October. Interested persons, and committee members will be sent a copy. Upon completion of the proofed draft, the pamphlet will be forwarded for endorsement by our association.

Publication of Committee Activity: Our sub-committee's call for information and participation appeared in the fall issue of "ENVIRONMENT NEWS DIGEST" and the month of October's "FOOD PROTECTION REPORT". Response was "almost overwhelming," according to chairman Charles Otto.

Recommendations:

As proposed by Charles Felix, member, that our committee review the model ice code "GUIDELINES FOR THE INSPECTION AND ENFORCEMENT OF G.M.P. REGULATIONS FOR THE HANDLING AND MANUFACTURING OF PACKAGED ICE", developed through the Association of Food and Drug Officials. Upon review, and if a committee endorsement is reached, we will recommend our IAMFES association endorse these guidelines.

As proposed by Larry Eils and Duain Shaw, members, that our committee survey other association's "Food Committee" to see areas that are not being addressed and topics our association would want to endorse. At our August, 1989 meeting we will discuss further and designate a survey.

Future Directions for 1990:

Development of a "CONSUMER SAFETY" pamphlet to provide safety awareness using microwave ovens in the home, food service and vending to be led by Larry Eils.

Development of guidelines for refrigerated foods' (labeling, temperature monitoring, etc.) to be led by Gale Prince.

Research of the solid waste issue and use of single service for public health reasons with local and state health associations by Charles Felix.

Respectfully submitted
Bennett Armstrong
Committee Chairman

Food Equipment Sanitary Standards Committee 1989

The Committee's objectives continue to include cooperation with public health agencies, organizations and the food industry in the development of uniform food equipment, construction and installation standards; to cooperate with the food industry and health agencies in the development and distribution of educational materials for the fabrication, installation and operation of food equipment standards and guidelines with the food industry and public health agencies; and, to keep the IAMFES membership informed of new and changing food equipment standards.

The Food Equipment Sanitary Standards Committee was very busy this past year with the review of a number of revisions of National Sanitation Foundation (NSF) standards. All standards are reviewed and updated every five years.

The NSF Joint Committee on Food Equipment met on April 27, 1989, and reviewed the proposed standards' revision and other issues.

More information on updates and revisions is available from the IAMFES office. Contact Margie Marble, 502 E. Lincolnway, P.O. Box 701, Ames, IA 50010, 515-232-6699 or outside Iowa 800-525-5223.

The Annual Meeting of the Automatic Merchandising Health-Industry Council (AMHIC) was held in October 1988. The Vending Machine Evaluation Program continues to be well recognized throughout the country by regulatory officials. The Council was informed that reevaluations have been conducted at all companies that wish to remain in the program. Presently NAMA lists three french fry machines and at least two additional units will be evaluated for compliance with vending machine standards. There have been questions raised by public health officials about a cotton candy vending machine.

The problem is access by the customer into the product dispensing area. These will be reviewed further.

There continues to be a safety problem with canned drink machines tipping or being tipped and causing serious injury. Vending machine operators and manufacturers have been provided with precautions that should be taken to prevent accidents from falling machines.

This has been a busy year and our goals for 1989 will continue to provide input into food equipment standards development.

Respectfully submitted
Duain B. Shaw, Chairperson

Dairy Quality and Safety Committee (Plant Section) 1989 Report

On Sunday July 31, 1988 at 11:00 a.m. the plant section of the Dairy Quality and Safety Committee met.

Fifteen members and attendees participated in the plant section meeting. Because this was the first time this group has met, much was discussed about the history of how the group came to be formed as well as the group's mission and goals.

This group met again in conjunction with the National Conference on Interstate Milk Shipments. The six members in attendance decided to pursue a survey of educational materials currently available. Gaylord Smith is heading up this effort. Other possible changes we discussed were dealt with further at our next meeting scheduled of August 12, 1989.

Respectfully submitted
Steven T. Sims

Dairy Quality and Safety Committee (Farm Section) 1989 Report

On Sunday, July 31, 1988 at 10:00 a.m. the farm section met.

Twenty-four members and attendees participated. Two new task groups were formed to complete the carryover projects from the farm methods committee.

The project recommending the voluntary use of uniform pictograms for farm cleaning compounds, sanitizers, udder washes, and teat dips was chaired by John Scheffel from the leadership cadre. Members included those individuals who were actively working on this issue with the farm methods committee as well as others selected by Mr. Scheffel.

Joseph Scolaro from the leadership cadre was selected to be in charge of publication of a recommended application for pipeline installations.

Two new task forces were also formed.

The task group on gathering and/or preparing educational materials on aseptic milk sampling was to be led by Gary Trimner and Ted Hickerson.

The task force on predipping and current PMO language was expanded to include several issues involving udder preparation and related potentials for residue in the milk. This group was led by Terry Mitchell and John Scheffel. They named other farmmethods members to complete their task group. These included liaison people who are also members of Northeast Dairy Practices Council, National Mastitis Council and other groups working in this area so that efforts by this group would not duplicate work already done.

It was also decided that the membership of the old farm methods committee would be polled to see how many wish to be retained in the farm section of the Dairy Quality and Safety Committee.

The farm section met again in conjunction with the February National Mastitis Council meetings.

The task group working on voluntary use of uniform pictograms for farm cleaning chemical compounds met after this meeting and has since prepared a final recommendation which will be published soon.

The task group on gathering and/or preparing educational materials on aseptic milk sampling reported that sufficient high quality materials already existed.

This group was thanked for its efforts and the membership released from this charge.

The farm section met again at 9:30 a.m. August 13 in Kansas City in conjunction with the summer IAMFES Meeting.

Respectfully submitted
Steven T. Sims

1989 NCIMS Report

Obviously, it's impossible to cover everything that took place at a conference such as NCIMS in one short presentation. Therefore, I'll try to review the highlights of what I feel were the most important actions taken.

First, I want to review two actions taken by the NCIMS Executive Board just prior to the beginning of the conference.

1. The Executive Board accepted FDA's solution to Problem #106 from the 1985 Conference and established an effective date of July 1, 1989.

   This problem deals with the separation of cream using temperatures between 125 degrees F and 161 degrees F. These products shall be considered "heat treated" and must meet the standards for Grade A milk and milk products as follows:

   - Milk products separated from milk heated between 45 and 125 degrees F must meet all chemical bacteriological and temperature standards for raw milk products.
   - Milk products separated from milk heated at temperatures greater than 125 F and lower than 161 F must meet all chemical, bacteriological and temperature standards for pasteurized milk and milk products. Except the phosphatase test.
   - Plants shipping "Heat Treated Products" shall meet the following additional criteria:

     1. Separation shall be done only in a Grade A plant.
     2. Separation can be done at any temperature between 125 and less than 161 degrees F.
     3. The heat treated product shall be cooled immediately after separation to 45 degrees F.
     4. The product can only be heat treated once. The next heat treatment must be proper pasteurization.
     5. The products shall be sampled at least 4 times in any consecutive six months in accordance with the sampling requirements of Section 6 of the PMO.
     6. Storage tanks that store "Heat Treated Products" shall meet the seventy-two hour emptying and cleaning requirements of item 12p.
     7. The product shall be identified on the bill of lading or other labeling as "Grade A Heat Treated _____". This product can not be identified as either "raw" or "Pasteurized".

2. The Executive Board accepted FDA's solution to Problem #223 from the 1987 NCIMS Conference and established an effective date of January 1, 1990.

   This problem deals with Section 6 of the PMO and requires at least four samples shall be collected in at least four separate months during any consecutive six month period. This pertains to raw milk from producers, raw milk for pasteurization collected at the plant and pasteurized milk and milk products.

   This prevents the collection of the four required samples in a relatively short period of time during the six month sampling period.

1989 Conference Actions

Conference deliberations throughout the week involved some 89 problems and 5 proposed Constitutional and By Law changes submitted prior to the Conference.

Emphasis was placed on resolving problems submitted which affect the methods of making sanitation ratings, drug residue, methods of issuing FDA interpretations and Constitution/By Law changes.

First I want to deal with what I believe to be the most significant actions taken and if time permits review other actions.

Problem 216 - Abolished the NCIMS/FDA Joint Committee on Interpretation and established guidelines for the issuance of interpretations as follows:

a. FDA develops interpretation(s) and issues them to state agencies and other interested parties with provisions for a 30 day comment period.
b. Comments shall be submitted to the NCIMS Executive Secretary/Treasurer who shall forward comments to FDA, Milk Safety Branch within 30 days of end of comment period.
c. If no comments are received by FDA by the end of the 60 day period, the interpretation becomes effective within

60 days. (Except in cases of public health emergency or the interpretation is a reinstatement of a previous policy, in which case the interpretation becomes effective immediately.)

d. The NCIMS Executive Board may within 60 days (with a majority vote) request FDA to consider modification or rescinding of the interpretation or extending the effective date.
e. Requires FDA to notify the NCIMS Executive Secretary/Treasurer of action FDA plans to take.

Several problems were submitted which deal with the drug residue issue. Of those submitted most attention was given to Problem #108. Much discussion was held on this problem.

One attempt to amend the problem as submitted was defeated.

Another amendment which became known as the "Murphy Amendment" passed. Much confusion seemed to exist as to what the amendment actually did and a motion to reconsider the problem was made. However, this motion failed. The "Murphy Amendment" requires the following:

1. Reduces the point value of Item 1r from 10 to 5 points and moves the 5 points to Item 16r.
2. Amends administrative procedures of Item 16r by adding the Procedure 9:

- Unapproved and improperly labeled medicinals/drugs are not stored in the milkhouse, milking barn, stable or parlor.
- Exempts topical antiseptics, wound dressings (unless intended for direct injection into the teat), vaccines and other biologics and dosage form vitamins and/or mineral products from storage requirements.
- Requires segregation of medicinals/drugs to be used on lactating animals from those to be used on non-lactating animals.
- Prevents the cleaning of drug administration equipment in milkhouse wash vats and requires storage of such equipment so as not to contaminate milk contact surfaces. This item would be on the inspection sheet 16r under a new Item h which would be a 2 point debit.
- Changes MMSR to show all violations of Item 16r to remain at 2 points, except f which will be a 7 point debit. However, the total of all debits under Item 16r could not exceed 7 points.

Problems passed by a conference must be confirmed by FDA to become effective.

This Problem #108 was confirmed by FDA. However, they have requested several modifications to the problem.

The NCIMS Executive Board will meet with FDA on Thursday of this week to resolve this issue and other problems which passed and which FDA does not concur with.

Since this issue has not been deliberated, I believe it would be premature for me to discuss the modification FDA has requested dealing with Problem #108.

Constitution and By Law Changes

Many felt these were the most significant changes made in many years, and were badly needed.

- Allows for the election of a state rating or enforcement person to replace a local health representative position on the Executive Board whenever no local health representatives, involved in milk related activities, are available within the region.
- Made NCIMS Liaison Committee Chairman a non-voting member of the Executive Board.
- Strengthened the power of the Executive Board to act on emergencies between conferences by specifically allowing them to poll states to determine support or non-support of proposed board action(s).
- Other changes were mainly housekeeping and clarifications.

Problem #119 - Procedure Change - Will consider each U.S. Trust Territory as a State, affording it with all rights, duties, responsibilities and privileges of a State at the Conference.

I want to leave the problem action for now and review the election of members to the Executive Board.

Due to a number of board members having served the maximum number of years allowed by the Constitution and other vacancies brought about by retirements or changes in employment, the largest number of new members were elected to the board at one conference in modern history occurred.

Al Place, New York Department of Agriculture was elected as the new Conference Chairman, replacing Jim Kennedy.

Leon Townsend was selected as the new Executive Secretary/Treasurer, replacing Herb Vaux.

In Region II, Rusty Bishop, Virginia Tech replaces Henry Atherton.

Bill Coleman, Minnesota Department of Agriculture replaces Jim Kennedy.

Earl Helmreich, Ohio Department of Health replaces Leon Townsend.

Larry Kettlehut, St. Louis City Health Department replaces Harold Bengsch.

In Region III, Jay Brown, Western Dairymen Coop. replaces John Allen.

Roland Golden, USDA replaces John Allen.

Non-voting member changes included Jim Kennedy, Past Chairman, replacing Jay Boosinger.

Dave Resh, Maryland Department of Health, replaces Lynn Smith as Chairman of Council II.

Dick Jolley, Florida Dairy Farmers Association, replaces Kirmon Smith as Chairman of Council III.

This is a total of 10 changes on the Executive Board.

Other Problems which passed and which FDA does not concur are Problems 116, 117, and 306.

There are other Problems that passed. For information on those Problems, contact Leon Townsend, NCIMS Executive Secretary/Treasurer, 110 Tecumseh Trail, Frankfort, KY 40601, 502-695-1088.

Presented by Leon Townsend
NCIMS Executive Secretary/Treasurer

Report of the International Dairy Federation Committee

USNAC expert group liaison strengthened

IDF expert groups are the "cutting edge" of IDF. Almost all the work product produced by IDF is created by these small groups. Thus, the effectiveness of an IDF member nation can be measured by the extent it maintains participation in expert groups that address the interests of its dairy industry.

We are grateful to those who have helped build expert group participation to this point. We are now expanding the USNAC expert group liaison function by appointing a Chairperson for each of the six Commissions plus a Coordinator. Those who have consented to serve are:

Commission A - C. A. Ernstrom, National Dairy Board
Commission B - T. W. Holzinger, Borden Co.
Commission C - J. W. Sliter, Sliter Association
Commission D - David Hettinga, Land O'Lakes
Commission E - D. E. Carpenter, Kraft-GF
Commission F - N. F. Olson, U. of Wisconsin

Robert Selman, Pfizer, Inc., will serve as the Coordinator of Commissions.

The principal tasks of this group of volunteers are to recruit qualified experts to serve on Expert Groups, to assist with responding to IDF Questionnaires and to assist with preparations for USNAC participation in IDF Annual Sessions.

1989 IDF Programme of Work

Ever wonder where you can find information about all those IDF groups of experts? The IDF Programme of Work, published annually, contains comprehensive information on groups, including:

Identity code and name
Membership and nationality
List of reports published by the group
Brief description of work completed and planned

The 1989 Programme of Work and information about IDF publications are available from the USNAC Secretary (Harold Wainess).

Zall to edit 1989 Annual Report

Dr. Bob Zall, Cornell University, will edit the 1989 USNAC Report. Meanwhile, after unforeseen delays, the 1988 USNAC Annual Report is available from the Secretary's Office.

USNAC Officers and Directors, 1989

Chairman - John H. Nelson, University of Wisconsin
Vice Chairman - Warren S. Clark, Jr., Amer. Diary Products Inst.;
Treasurer - Gregory M. Farnham, Sanofi Bio Ingredients;
Secretary - Harold Wainess, Harold Wainess & Assoc.;
Asst. Sec'y - Ken Anderson, Harold Wainess & Assoc.

Directors, in addition to the five top officers:

James C. Barr, National Milk Producers Federation
Donald Carpenter, Kraft-GF
C. A. Ernstrom, Natl. Dairy Promotion & Research Bd.
David Hettinga, Land O'Lakes, Inc.
H. H. Van Horn , American Dairy Science Association
Thomas Holzinger, Borden, Inc.
R. L. Sellars, Chr. Hansen's Laboratory, Inc.
Sava Stefanovic, Pure-Pak, Inc.
Douglas Webb, United Dairy Industry Association

New IDF publications received January to date

Bull. 232 The Quality, Treatment, and Use of Condensate and Reverse Osmosis Permeates.
Bull. 233 Trends in the Utilization of Whey and Whey Derivatives.
Bull. 234 Code of Practice for Preservation of Raw Milk by Lactoperoxidase System.
Bull. 235 Interlaboratory Collaborative Studies--second series.
Bull. 236 Corrosion.
Bull. 237 Consumption Statistics for Milk and Milk Products, 1987.
Bull. 238 Monograph on Heat-Induced Changes in Milk.
Bull. 239 The Present and Future Importance of Imitation Dairy Products.
Bull. 240 The Use of Ultrafiltration Technology in Cheesemaking.

Respectfully submitted
Harold Wainess, Chairman

IAMFES Awards Presented . . .

SANITARIAN'S AWARD PRESENTED TO ROBERT J. GALES

In recognition of outstanding service to the profession of the Sanitarian, the Sanitarian's Award was presented this year to **Robert J. Gales** of Hancock, New York. Gales is the Chief Rating Officer for the New York State Department of Agriculture & Markets Milk Control Division.

Gales received a plaque and $1,000. The Sanitarian's Award is sponsored and presented annually by the Klenzade Division of Economics Laboratory, St. Paul, MN, Diversey-Wyandotte, Wyandotte, MI, and the Monarch Division of H.B. Fuller, Minneapolis, MN.

(l to r) Damien Gabis presents Educator Award to V. S. Packard of St. Paul, MN.

1989 IAMFES EDUCATOR AWARD PRESENTATION

Presented to an educator in recognition of outstanding service in academic contributions to the profession of the Sanitarian went to **Vernal S. Packard**, sponsored this year by IBA Incorporated, Milbury, MA. Packard is with the University of Minnesota, St. Paul, MN. He received a $1,000 check and a plaque.

HAROLD BARNUM INDUSTRY AWARD

(l to r) John Meyer, NASCO International; Lowell Allen and Ron Case, IAMFES Pres. Elect.

Given in recognition of outstanding service to the public, IAMFES, and the profession of the Sanitarian, this award is sponsored by NASCO International, Ft. Atkinson, WI. John Meyer of NASCO presented a $500 check along with a plaque to **Lowell Allen** of Howell, MI.

After 38 years, Allen retired from Michigan Milk Producers Association in the Fall of '88 in the capacity of Director of Member Services. Prior to retirement, he was responsible for the activity of 29 fieldmen, the Director of Testing, the clerical member service department, and the coordination of milk hauling routes servicing the MMPA members.

Clem Honer receives the Citation Award.

CITATION AWARD

For many years of devotion to the ideals and objectives of the association., a plaque was presented this year to **Clem Honer** of Richland Center, WI. Honer is Technical Editor for DAIRY FOODS MAGAZINE.

Earl O. Wright, Honorary Life Membership recipient.

HONORARY LIFE MEMBERSHIP

For devotion to the high ideals and principles of IAMFES. This award is sponsored by the IAMFES Foundation Fund which entitles the winner to life membership with IAMFES including the *Journal of Food Protection* and *Dairy, Food and Environmental Sanitation*, and a plaque. This year's winners were **Earl O. Wright** of Bella Vista, AR who is retired and a consultant for Dairy & Food Processing, and **Vernon R. Cupps** from Neosho, MO who is presently retired Chief, Milk Control Service with the City of St. Louis Health Division.

Bill Coleman and Dave Fry from Georgia.

SHOGREN AWARD

Is presented to an Affiliate of IAMFES for service to their members in the past year. This year **Georgia Association of Food & Environmental Sanitarians** received a certificate and $100 check for their services and contributions.

Vernon R. Cupps receives the Honorary Life Membership Award.

(l to r) Robert Gravani, Robert Crombie and Charles Price.

CERTIFICATE OF MERIT AWARD

Is presented to those affiliate members who are active within their state/province affiliate group and IAMFES. This year the award was presented to **Charles Price**, Lombard, IL, and **Robert Crombie**, Joliet, IL.

1989 Sherman Awards sponsored by the National Restaurant Assoc. were presented by Kathleen Wood to Karl Eckner, Edmund Zottola and Robert B. Gravani (see p. 645).

Robert Gravani presents Membership Achievement Award to the California Assoc. of Dairy and Milk Sanitarians accepted by Austin Olinger.

MEMBERSHIP ACHIEVEMENT AWARD

Is presented to the IAMFES Affiliate who has had the most new members in the past year. Austin Olinger accepted the certificate for the **California Association of Dairy & Milk Sanitarians.**

Charles Felix presents incoming President Ron Case with the official gavel.

(l to r) Ron Case presents the IAMFES Presidential plaque to Robert Gravani.

(l to r) Charles Felix and Darrell Bone.

SAMUEL J. CRUMBINE CONSUMER PROTECTION AWARD

Is presented annually for excellence in a comprehensive program of food and beverage sanitation at the local level. This year's recipient was the **Albuquerque Environmental Health Dept.**, accepted by Darrell Bone, QA Coordinator.

(l to r) Hassan Gourama, Karl Eckner, David Baker, Diane West and Nancy Nannen, winners of the Developing Scientist Awards.

(l to r) Hassan Gourama, Diane West and Dr. Lloyd Bullerman all from the University of Nebraska.

DEVELOPING SCIENTIST AWARDS

Were presented to five students, judged on their paper and presentation at the IAMFES Annual Meeting. These awards are sponsored by the IAMFES Foundation Fund. First place went to **Nancy Nannen**, University of Nebraska. Nancy's presentation was on "Intracellular pH Effects in Lactic Acid Bacteria". She received a plaque along with a $500 check. Second place went to **Diane West**, also from the University of Nebraska. Diane's paper, titled "The Evaluation of Various Growth Media Used to Determine Percent Mold Infection of Grains" won for her a certificate along with $200. The third place was taken by **David Baker**, University of California. David's presentation was titled "Clostridium Botulinum Growth in Fresh Fish Stored Under Modified Atmospheres, Use of Predictive Modeling in Quantifying the Risk of Toxicity in This and Other New Generation Refrigerated Foods". David accepted a certificate and $100. Fourth place went to **Karl Eckner** from the University of Minnesota. His paper was titled "Growth and Survival of Salmonella Typhimurium, Staphylococcus Aureus and Pseudomonas Fragi During the Manufacture and Storage of Colby Cheese Made From Pasteurized UF Concentrated Milk". Karl was presented with a certificate and $50. Fifth place went to **Hassan Gourama**, University of Nebraska. Hassan also received a certificate and $50 for his paper titled, "Inhibition of Growth and Aflatoxin Production by Lactic Acid Bacteria".

76th IAMFES Annual Meeting Exhibitor Review

The following is a brief description of the companies exhibiting at the 1989 IAMFES Annual Meeting, August 13-17, in Kansas City, Missouri.

To obtain more information on any of these companies, circle the appropriate number and complete the Exhibitor Reader Service Card in the back of the magazine. Return this card to IAMFES and your inquiries will be forwarded to each company.

1. **Advanced Instruments,** Needham Heights, MA, — Manufacturer of milk cryoscopes and Fluorophos™ three minute test for residual phosphatase in dairy products.
2. **Ampal Pallets Inc.,** Oakville, Ontario, Canada, — Introducing new technology in material handling. Pallets made from galvalume, a non-corrosive metal, offer lighter weight, strength, durability and decontamination by steam cleaning.
3. **Ampco Pumps,** Milwaukee, WI, — Ampco "D" series solution pumps designed solely for pumping, cleaning and/or sanitizing solutions. Conforms to 3A's new standard 605-03.
4. **Aquionics,** Erlanger, KY, — Ultraviolet Light Disinfection Systems for air and fluids.
5. **Atkins Technical, Inc.,** Gainesville, FL, — Fast response, high accuracy digital thermometers and temperature probes for foodservice applications, thermocouples, thermistors.
6. **Becton Dickinson Microbiology Systems,** Cockeysville, MD, — Products utilized for the cultivation and identification of foodborne pathogens, including *Salmonella* and *Listeria*.
7. **BIOSAN Laboratories,** Ferndale, MI, — Food microbiology services; Microbiological Test Kits for measuring bacteria, yeast and molds in foods and on surfaces.
8. **Capitol Vial, Inc.,** Fultonville, NY, — Vials - Sterile, Leakproof, Airtight - FDA approved - Up to 16 colors offered. Also will be displaying unique insulated shippers and racks. Ask about our unique guarantee.
9. **Chempar, Div. of Lipha Chemicals, Inc.,** Milwaukee, WI, — Full line of Maki and Rozol brand rodenticides and the Ratstraunt Bait Station.
10. **Chicago Blower Corporation,** Glendale Heights, IL — USDA Approved Sanitary Fan.
11. **Control One, Inc.,** Greenwich, CT, — Temperature and Humidity Recorders providing off-line data acquisition of low frequency in preprogrammed sequences.
12. **DSI Process Systems,** St. Louis, MO, — Full line sanitary processing capabilities and environmentally sound food ingredient slurry and handling systems from the Dri-Flo Co. Division.
13. **Deibel Laboratory/Summit Laboratory Supply,** Madison, WI, — Blendo Flask for Salmonella and Listeria Preenrichment cultures.
14. **Difco Laboratories,** Detroit, MI, — Dehydrated Culture Media, featuring 4 new media for Listeria as well as media for Yersinia and hemorrhagic E. coli.
15. **Diversey Wyandotte Corp.,** Wyandotte, MI, — Shur Graph CIP monitoring and documentation system.
16. **J. T. Eaton & Company, Inc.,** Twinsburg, OH, — Rat and Mouse Bait, Bait Stations and Glue Boards, Bird Repellent and Squirrel Repellent, Fly Traps, Roach Traps.
17. **Educational Foundation of the National Restaurant Association,** Chicago, IL, — Educational training materials for owners and operators, manufacturers of food related products, i.e. Applied Foodservice Sanitation.
18. **Educational Testing Service,** Langhorne, PA, — Brochures describing the Food Protection Certification Program - A Test to determine knowledge to prevent foodborne illness.
19. **Charles Felix Associates,** Leesburg, VA, — Publishes *Food Protection Report* and *Food Talk* and represents the Foodservice and Packaging Institute and the Packaged Ice Association.
20. **Fluid Equipment Company, Inc.,** Independence, MO, — Aqua-Aerobic/SBR Systems, Rovalve cast stainless knifegate valves, Brand & Luebbe/ Stainless Steel metering pumps and systems, Sani-Tech/Sanitary process tubing and fittings for food and dairy.
21. **Foss Food Technology Corp.,** Eden Prairie, MN, — Instrumentation to accomplish Compositional Analysis of Milk and Dairy products. Information will be available on On-Line Standardization as well as Somatic Cell Counting.
22. **H. B. Fuller Co., Monarch Division,** Minneapolis, MN, — Dairy and Food Sanitation Programs.
23. **GENE-TRAK Systems,** Framingham, MA, — GENE-TRAK will be exhibiting a full line of Colorimetric DNA Probe Assays for the rapid detection of food borne pathogens.
24. **GO-JO Industries, Inc.,** Akron, OH, — Purel Total Hand Sanitizing System, features antibacterial lotion soap and instant hand sanitizer. System helps reduce risk of foodborne illness outbreak.
25. **Golden Star, Inc.,** North Kansas City, MO, — Antimicrobial Wet and Dust Mops, Antimicrobial Mats, Entrance Mats and Mattings, Indoor and Outdoor Mats and Mattings.
26. **Gundle Lining Systems, Inc.,** Houston, TX, — Manufactures and installs High Density Polyethylene Liner in 20 mil to 140 mil thick and in 22.5 ft. seamless widths.
27. **Hach Company,** Ames, IA, — Analysis systems for coliforms, total bacteria and yeast & mold. New ColiQuick enzyme MPN test, PourRite MF ampules and dip testers.
28. **Henkel Corporation, Chemical Services Div.,** Ambler, PA, — New, Patented Sanitizer Technology; RO/UF Membrane Cleaning Systems; specialized cleaners for all Food/Dairy Industries.
29. **Idetek, Inc.,** San Bruno, CA. — Idetek, Inc. will feature new diagnostic technology for quick tests of milk and other food products for antibiotics and other contaminants.

30. **IDEXX Corp.,** Portland, ME, — IDEXX is an international biodetection company. Products include Diagnostic Tests for poultry, livestock, animals and equine.
31. **Integrated BioSolutions, Inc.,** Princeton, NJ, — The Lumac Biocounter® for rapid line hygiene and microbial determinations, and the MicroSys Microbiology Information Management System.
32. **Kansas City Valve & Fitting,** Kansas City, MO, — Tube fittings, valves and fluid system components.
33. **Kirkegaard & Perry Laboratories,** Gaithersburg, MD, — Labeled or unlabeled affinity purified antibodies to *Salmonella* (CSA-1), *E. coli* 0157:H7 and *Listeria* species, positive control antigens and complementary products.
34. **Kness Mfg. Co., Inc.,** Albia, IA, — Manufacturer of the "Original" [1]Ketch-All Automatic Moustrap, [2]Single Catch Moustrap, "SNAP-E" [3]Big SNAP-E Rat Trap - easy bait, easy set, easy release. [4]Complete line of live catch animal traps, new and better - "KAGE-ALL".
35. **Los Alamos Diagnostics,** Los Alamos, NM, — Test kits and instrumentation for rapid determination of bacterial and yeast contamination of raw materials, final products and process equipment.
36. **Michelson Laboratories, Inc.,** Commerce, CA, — Independent analytical testing laboratory to conduct chemical, and microbiological analysis. Also offering control samples for Infra Red Milk Analyzer and Somatic Cell Counter.
37. **Mint Solutions,** Pierre, SD, — Regulatory computer software.
38. **Nasco,** Fort Atkinson, WI, — Whirl-Pak sampling bags are on display in Nasco's booth. Whirl-Paks are the perfect sample container, for any sampling purpose.
39. **National Automatic Merchandising Association,** — National trade association of the merchandise vending machines and contract foodservice management industry.
40. **The National Food Laboratory, Inc.,** Dublin, CA, — Complete, confidential, Contract R&D Services including the areas of microbiology and sanitation. These programs provide technical expertise in GMP Sanitation audits, QC and HACCP programs, microbiology. Challenge, TDT and Inoculated Pack studies.
41. **Nelson-Jameson, Inc.,** Marshfield, WI, — Experts in supplying Food and Dairy Laboratories with a complete selection of glassware, reagents, equipment and culture media. Reliable service.
42. **Oregon Digital Systems, Inc.,** Corvallis, OR, — "Inspection Manager" a computerized inspection system utilizing handheld computers and function specific software that interfaces with an office based computer system.
43. **Organon Teknika Corp.,** Durham, NC, — Listeria-Tek: Rapid ELISA Detection for Listeria sp. Salmonella-Tek: Rapid ELISA Detection System for Salmonella sp. Aflatoxin M_1: ELISA.
44. **Oxoid U.S.A., Inc.,** Columbia, MD, — Salmonella Rapid Test Kit, various Toxin Detection Kits. Aflatoxin Detection Kits, Dehydrated Microbiological Culture Media, and related laboratory products.
45. **Penicillin Assays, Inc.,** Malden, MA, — CHARM II Test for Antibiotics and Mycotoxins, Computer Interfacing with CHARM II, CHARM Inhibition Assay - Sensitive Disc Diffusion Test for Antibiotics.
46. **RCR Scientific, Inc.,** Goshen, IN, — Redigel Agar Replacement System.
47. **REMEL,** Lenexa, KS, — Prepared culture media, bottled media, environmental sampling plates, dilution broths, quality control media for food and dairy testing.
48. **Radiometer America, Inc.,** Westlake, OH, — Malthus 2000 Microbiology System. Detects levels and activity of micro-organisms with results obtainable in hours, automatically.
49. **Silliker Laboratories, Inc.,** Chicago Heights, IL, — Food industry services in the areas of Microbiology, Chemistry, Research, Information Services, Technical Services and Consulting will be exhibited.
50. **SmithKline Animal Health Products,** West Chestser, PA, — PENZYME® Antibiotic Residue Screen Test for Milk; SIGNAL® Detection Tests for mycotoxins and sulfamethazine; SIGNAL Microorganism Screening System for environment.
51. **The Soap and Detergent Association,** New York, NY, — Generic educational literature on cleaning products, information for managers responsible for environmental sanitation, materials on preventing occupational skin diseases.
52. **Sparling Instruments Co., Inc.,** El Monte, CA, — Magnetic Flow Meters and Ultrasonic Level Meter.
53. **Sparta Brush Co., Inc.,** Sparta, WI, — Specialized Brushes for the Milk, Food and other Process Industries, featuring Sparta's Tri-Zone Color Coded Brush Program to prevent Cross-contamination.
54. **Swagelok Company,** Solon, OH, — Tube fittings, valves, and fluid system components.
55. **3-A Sanitary Standards Symbol Council,** Waukesha, WI, — Trustees and Staff will be on hand to explain the background and function of the 3-A Symbol Program. Literature and application for 3-A Symbol authorization will be available.
56. **3M Microbiology Products,** St. Paul, MN, — 3M Petrifilm™ plates for bacteria identification, 3M Report™ Salmonella immunoassay.
57. **The Tintometer Company,** Williamsburg, VA, — The Tintometer Company will display visual and electronic colorimeters and spectrophotometers for use in color quality control. Also, water analysis equipment.
58. **Tufco Flooring,** Gentry, AR, — A 6 layer laminated flooring system which is non-skid, non-porous and chemical resistant. USDA and OSHA accepted. Also the R-19 Patch Kit.
59. **23rd International Dairy Congress 1990, Montreal, Quebec, Canada,** — Promotional material for the 23rd International Dairy Progress and Dairy Exhibition to be held in Montreal, 8-12 October 1990.
60. **Wescor, Inc.,** Logan, UT, — OMNISPEC™ instrument for measuring total counts, antibiotics, abnormal milk, psychrotrophs, coliforms, etc. Mas-D-Tec™ for Cowside Mastitis detection.
61. **West Agro, Inc.,** Kansas City, — Effects of three (3) common germicides on milk residue levels and complete new line of cleaners and sanitizers for food and dairy plant sanitation.
62. **Vicam-Aflatest,** Somerville, MA, — Mycotoxin testing system.
63. **Vitek Systems, Inc.,** St. Louis, MO, — VITEK is committed to provide the Milk and Food industry with RAPID Microbiology Systems.
64. **Walker Stainless Equipment Co., Inc.,** New Lisbon, WI, — Filter Flo Transport Tanker Manhole Filter.
65. **Weber Scientific,** East Windsor, NJ, — Gerber and the New Modified Babcock Butterfat Tests, Bacteria Count supplies featuring the New Disposable Dilution Bottle, Antibiotic Residue Tests.
66. **X-O Corporation,** Dallas, TX, — Odor Neutralizer for every type of odor elimination. X-O is natural, organic, biodegradable, non-toxic, non-flammable, safe around people and pets. It is concentrated and guaranteed.

Letter to the Editor

Dear Friends:

I want to extend my deepest thanks and appreciation for the lifetime membership and honor given me at the Annual Meeting Banquet in K.C. on Aug. 16, 1989. It is an honor I will enjoy and treasure for years to come.

I extend my apologies for not making the usual and proper acceptance speech - for once in my life I truly was speechless!

I have always been very proud of the IAMFES organization. It is the most professional, and yet friendly, group of people I have ever been privileged to work with.

Thanks again.

Sincerely,
Vernon R. Cupps

New IAMFES Members

Alabama

Sacit F. Bilgili
Dept. Poultry Sci./
Auburn University
Auburn

John Y. Lu
Tuskegee University
Tuskegee

Peter Obimro Lamuka
Alabama A&M Univ.
Normal

Arkansas

Dr. Corliss O'Bryan
Hudson Foods
Rogers

California

Raymond L. McElwain
Centennial Meat Co.
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Davin Enigl
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Florida

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Gainesville

Georgia

Donald J. Wudarski
NSF
Norcross

Illinois

Dr. Larry Maturin
FDA
Chicago

Bob Krause
Dove Intl.
Burr Ridge

Dennis Martin
Prairie Farms Dairy
Granite City

Skip Seward
McDonald's Corp.
Oak Brook

R. Eugene Wharton
National Farmer
Sandoval

Iowa

Michael Darnell
Henkel Corp.
Burlington

Vicky Streicher
State of Iowa
Edgewood

Kansas

John Begley
U.S. Army
Leavenworth

Carl Lee
U.S. Army
Leavenworth

Walter L. Flowers
Kansas Dept. of Health & Environment
Overbrook

Jo McDaniel
Topeka - Shawnee Co. Health
Topeka

Massachusetts

Kelly A. Story
Eastman Gelatine Corp.
Peabody

Barbara A. Kulig
Health Department
West Springfield

Maryland

David H. Campbell
Nanticoke Seafood
Nanticoke

Michigan

Dennis Bogart
Diversey Wyandotte
Wyandotte

Catherine Dilley
Neogen Corporation
Lansing

Jonathan Chen
Endocrine Research Ctr.
E. Lansing

Minnesota

Sue McAllister
Microbiology Products
3M Health Care
St. Paul

Diane Roblee
Microbiology Products
3M Health Care
St. Paul

Missouri

Christopher Morales
Boyle's Famous Corned Beef Co.
Kansas City

Fred Trease
Newton/Jasper/McDonald Co./Joplin City Health Dept.
Joplin

Ronald L. Lightle
Mid America Dairymen
Springfield

Carl Olson
Cole County Health
Jefferson City

Martin Ellison
U.S. Army
Kansas City

Nebraska

Deborah Christensen
Memorial Hosp. of Dodge County
Fremont

New Hampshire

Gwen Copeland
Food & Nutrition Services
Concord

New Jersey

Kathleen Young-Perkins
General Foods U.S.A.
Cranbury

Tim Pettitt
Nabisco Biscuit Co.
E. Hanover

New York

Jay Kidney
U.S. Air Force
Saranac

North Carolina

Nadine Tope
NC State Univ.
Raleigh

North Dakota

Mel Verbout
Cass Clay Cry
Fargo

Ohio

Christine J. Daniel
Stolle Research & Development
Cincinnati

Nancy Collins
Borden Food Service
Cincinnati

Jeffrey S. Zornow
Dayco Products
Dayton

Mary E. Baseler
Stouffer Foods
Solon

Pennsylvania

John A. Marriott
City of Hermitage
Hermitage

Rodney A Smeltz
Penn State Univ.
State College

Stephen J. Knabel
Penn State Univ.
State College

South Dakota

Twila Kunde
SD State Health Laboratory
Pierre

Tennessee

R.L. Beard
Monterey

Texas

Janeene Pappas
Houston Health & Human Services
Houston

I.W. Jarrell III
Tx. Dept. of Health
Ft. Worth

John L. Southerland
Portion-Trol Foods, Inc.
Mansfield

Louis Doak
Associated Milk Producers Inc.
(AMPI)
Stephenville

Wisconsin

Robert Ash
Redi Roast Products
Green Bay

Washington, DC

Reginald W. Bennett
Food & Drug Administration
Washington, DC

Ellen M. Schroth
Foodsense, Inc.
Washington, DC

Australia

Jan Zadarnonski
Diversey
Seven Hills

Canada

Michael Whitfort
Ampal Pallets
Oakville, Ontario

Eric H. Jackson
Edmonton, Alberta

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These three excellent manuals are based on epidemiologic principles and investigative techniques that have been found effective in determining causal factors of disease outbreaks.

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International Association of Milk, Food and Environmental Sanitarians Inc.
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3-A Accepted Practices for the Design, Fabrication and Installation of Milk Handling Equipment

Number, 606-03
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. Milking and milk handling equipment specifications heretofore or hereafter developed which so differ in design, material, and fabrication, or otherwise as not to conform with the following practices, but which in the fabricator's opinion, are equivalent or better, may be submitted for the joint consideration of IAMFES, USPHS, and DIC at anytime.

A

SCOPE

A.1

These 3-A Accepted Practices shall pertain to equipment used in a milking system that begins with the equipment applied to the cow to extract milk and continues to all components in the system and to the container in which the raw milk is stored or from which the milk is removed from the dairy farm.

A.2

In order to conform with these 3-A Accepted Practices, milking and milk handling equipment shall comply with the following design, material, fabrication and installation criteria.

B

DEFINITIONS

B.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

Solution Contact Surfaces: Shall mean the interior surfaces of the circuit which are used exclusively for supply and recirculation of cleaning and sanitizing solutions.

B.3

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

B.4

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

B.5

Long Air Hose: Flexible air tube or hose that connects (1) a claw or milk cup to a bucket or (2) a bucket to a vacuum pulsator line, or (3) a claw to a vacuum pulsator line.

B.6

Air Tube: The flexible air hose or tube between the claw, or unit mounted pulsator and the teat cup.

B.7

Claw: The sanitary manifold that spaces and connects the teat cup assemblies into a milking unit.

B.8

Milk Cup: A reservoir adjoining the claw between the milk tubes and the milk hose.

B.9

Milk Hose: A flexible hose or tube that connects the claw or milk cup to a bucket or a milking pipeline or a milk conveying line.

B.10

Milk Inlet: A nipple on the milking pipeline or milk conveying line for attaching the milk hose.

B.11

Milking Vacuum: That vacuum to which the teat of the cow is exposed during milking when the teat cup liner or inflation is open.

B.12

Milking Pipeline: A rigid pipe or tube which performs the dual function of transporting milk and air.

B.13

Milk Conveying Line: A pipe which performs the single function of transporting milk.

B.14

Milk Tube (short): A tube that connects the liner to the claw milk nipple.

B.15

Milk Inlet Valve: An open-close device incorporated in the milk inlet.

B.16

Nipple: A short pipe projecting from the claw, pulsator, milking machine lid or other part of the milking system apparatus.

B.17

Receiver (milk): A vessel that receives milk from the milking pipe line or milk conveying line.

B.18

Releaser: A device that releases milk from under vacuum and discharges it to atmospheric pressure.

B.19

Sanitary Trap: A flow vessel that separates the milk side of a milking machine system from the vacuum supply side to keep milk and fluids out of the vacuum system and to prevent back-flow of fluids.

B.20

Stall Cock: The valve device on the vacuum pulsator line to which the air hose or pulsator is attached.

B.21

Main Vacuum Supply Line: The rigid pipe or tube from the vacuum supplier through the sanitary trap to the receiver.

B.22

Vacuum Pulsator Line: The rigid pipe or tube that supplies vacuum to the pulsator(s).

B.23

Vacuum Pump: An air pump(s) connected to a milking system that creates a suction and maintains partial vacuum.

B.24

Pipeline Milking System: A system utilizing milking pipelines and/or milk conveying lines.

B.25

Milking System CFM/LPM* Test Port:* A fitting provided for entry to the vacuum system in the main vacuum supply line at the vacuum pump.

B.26

Teat Cup Shell: The metal or plastic case or shell in which the teat cup liner or inflation is enclosed.

B.27

Teat Cup Liner or Inflation: A rubber or rubber-like flexible sleeve with mouthpiece, barrel and an integral or separate short milk tube, which fits inside the teat cup shell.

B.28

Teat Cup Assembly: The teat cup shell and liner or inflation.

B.29

Distal Receptacle: A glass or stainless steel vessel positioned at the end of the pipeline and is used for washing the pipeline.

B.30

Reverse Flush System: A method whereby solution is drawn by vacuum to a releaser-type receptacle (distal receptacle) located at the end of a single milk line. After the receptacle is filled, solution returns to the cleaning vat by gravity. This process is repeated several times during the wash cycle.

B.31

Weigh Jar: A collecting reservoir located between the milking unit and the pipeline and which is used to measure the volume of milk from an individual cow.

B.32

Air Injectors: A mechanical valve used to admit air intermittently into the washing system to increase the cleaning action.

B.33

Transfer Station: A transfer station is a receptacle and piping or tubing system which conveys milk from the milking area to the container in which the milk is stored. Transfer stations are used with the pail or bucket milking units.

C

MATERIALS

C.1

The materials of product contact surfaces of equipment included in the milking system for which there are 3-A Sanitary Standards or 3-A Accepted Practices shall comply with the material criteria of the applicable standards or accepted practices.

C.2

Other product contact surfaces shall be of stainless steel of the AISI 300 series *[1] or the corresponding ACI *[2] types (See Appendix, Section H.) or equally corrosion resistant metal that is non-toxic and non-absorbent, or of heat resistant glass, except that:

C.2.1

Single service gaskets may be used except in joints in permanently installed pipelines designed for mechanical cleaning.

C.2.2

Rubber and rubber-like materials may be used in sealing applications, milk hoses, milk tubes, air hoses, air tubes, filter parts, teat cup liners, O-Rings, drip deflectors, and level sensing devices (probes) and parts having the same functional purposes.

C.2.3

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.2.4

Plastic materials may be used in sealing applications, transparent flexible tubing for transfer stations, milk hoses, milk tubes, milk line fittings, air hoses, air tubes, sight and light openings in permanently installed lines, filter parts, teat cup liners, O-Rings, drip deflectors, level sensing devices (probes), claws, milk cups, metering devices, releaser dumping chambers, pipeline drain assemblies, air injectors and milk inlets and parts having the same functional purposes.

C.2.5

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 Materi-

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*CFM means cubic feet per minute.

*LPM means liters per minute.

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[1] The data for this series are contained in the following reference: AISI Steel Products Manual, Stainless and Heat Resisting Steels, December 1974, Table 2-1, pp. 18-19. Available from American Iron and Steel Institute, 1000 16th St., NW, Washington, DC 20036.

[2] Alloy Casting Institute Division, Steel Founders' Society of America Cast Metal Federation Bldg., 455 State St., Des Plaines, IL 60014.

als, Number 20-15, as amended.

C.2.6

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

C.2.7

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

C.3

Materials used for lines, fittings and filter media for air under pressure that will be in contact with the product or product contact surfaces shall comply with applicable provisions of the 3-A Accepted Practices for Air Under Pressure, Number 604-03.

C.4

Solution contact surfaces shall be of stainless steel of the AISI 300 series*[1] or corresponding ACI*[2] types (See Appendix, Section H.), 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 or of heat resistant glass piping. Rubber and rubber-like materials or plastic materials complying with C.2.3 or C.2.5 may be used for sealing applications and for short flexible takedown jumpers or connectors.

C.5

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

C.6

Main vacuum supply lines and/or vacuum pulsator lines shall be made of materials which will withstand periodic cleaning. If these lines are used as part of the product contact surface cleaning circuit, they must comply with Section C.4.

D

FABRICATION - GENERAL

D.1

The fabrication criteria of equipment included in the milking system for which there are 3-A Sanitary Standards or 3-A Accepted Practices shall be those of the applicable standards or accepted practices.

D.2

Other equipment shall conform to the following fabrication criteria.

D.2.1

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

D.2.2

Appurtenances having product contact surfaces shall be cleanable, either when in an assembled position or when disassembled and be so designed as to facilitate inspection. Removable parts shall be readily demountable.

D.2.3

All internal angles of 135 degrees or less on product contact surfaces shall have minimum radii of 1/4 inch (6 mm) except that:

D.2.3.1

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

D.2.3.2

The minimum radii in grooves for standard 1/8 inch (3 mm) O-Rings shall not be less than 1/32 inch (one mm).

D.2.3.3

Radii smaller than 1/4 inch (6 mm) may be used where required for essential functional reasons, such as O-Ring grooves, claw assemblies, and milking machine lids. In no case shall such radii be less than 1/32 inch (one mm).

D.2.4

Non-product contact surfaces shall have a smooth finish, be free of pockets and crevices, and be readily cleanable. Surfaces to be coated shall be effectively prepared for coating to assure adhesion.

D.2.5

Lids or covers shall be provided for milk carrying pails and transfer station receptacles. Lids on transfer station receptacles shall be self closing. All ungasketed lids shall have over-lapping edges turned down at least 3/8 inch (10 mm) below the top of the milk pail or receptacle. The lids or covers on milk carrying pails and transfer stations shall be pitched to an outside edge(s) so as to be free draining.

D.2.6

All milking pipelines and/or milk conveying lines and other appurtenances entering through the lid or cover of the cooling and/or holding tank, and not permanently attached to the cover, shall be fitted with a sanitary drip deflector that overlaps the edges of the opening through the cover and is located as close as possible to the cover.

D.2.7

All permanent joints in metallic product contact surfaces shall be welded.

D.2.8

The bottom of all product containers (tanks, receivers, etc.) which have a sanitary connection outlet shall have at least a 1/4 inch per foot (6 mm per 30.5 cm) pitch to the outlet.

D.2.9

Milking systems that are to be mechanically cleaned shall be designed so that the product contact surfaces of the milking system, and all non-removable appurtenances thereto can be mechanically cleaned and are accessible for inspection.

D.2.9.1

Each separate cleaning circuit, including product and solution lines, shall be provided with a sufficient number of access points, such as valves, fittings, or removable

sections to make possible adequate inspections and examinations of representative interior surfaces.

D.2.10
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.2.11
All sanitary fittings and connections shall conform to the 3-A Sanitary Standards for Fittings, Number 08-19, Parts I and II, rev., except that plastic fittings and connections that comply with Section C.2.5 and glass fittings and connections that comply with Section C.2 may be used. All sanitary pipeline (tubing) shall conform to 3-A Sanitary Standards for Polished Metal Tubing, Number 33-00.

D.2.12
Coil springs having product contact surfaces shall have at least 3/32 inch (2 mm) openings between coils, including the ends when the spring is in the free position.

D.2.13
Handles and brackets shall be permanently attached to the equipment.

D.2.14
Bonded rubber and rubber-like materials and bonded plastic materials having product contact surfaces shall be bonded in a manner that the bond is continuous and mechanically sound so that when exposed to the conditions encountered in the environment of intended use and in cleaning and bactericidal treatment the rubber and rubber-like material or the plastic material does not separate from the base material to which it is bonded.

E
FABRICATION - SPECIFIC ITEMS
The following are requirements for specific items.

E.1
Milking Machine Pails
A tipping handle, located near the bottom, shall be provided on a floor type pail. A lid shall be provided for both floor and suspended-type pails. Bails, handles, chines and legs on both types of milking machine pails shall be considered non-product contact surfaces.

E.2
Milk Claws and Milk Cups

E.2.1
Nipples for the milk hoses and milk tubes shall be flush with the interior surface of the claw or milk cup.

E.2.2
The claw or milk cup shall be designed so that cleaning and sanitizing solutions will drain when the claw or milk cup is in the cleaning and sanitizing position.

E.3
Sanitary Check Valves

E.3.1
A bucket type milking machine shall be provided with a sanitary check valve or other device that will prevent moisture or any contaminating substance from entering the milk from the vacuum system. A sanitary check valve or other device that will pass the test in Appendix, Section J is considered to meet this provision.

E.3.2
The moveable portion of the sanitary check valve shall be of one piece construction or the parts shall be bonded together.

E.4
Transfer Stations

E.4.1
The transparent plastic tubing used in conjunction with a transfer station shall be one continuous piece. Equipment for air drying transfer tubing shall be provided. The air drying equipment shall comply with the applicable provisions of the 3-A Accepted Practices for Air Under Pressure, Number 604-03.

E.4.2
Pumps, if supplied, shall conform to the 3-A Sanitary Standards for Centrifugal and Positive Rotary Pumps, Number 02-08.

E.4.3
Pumps, when used, shall be actuated by a milk level sensing device, and if of the probe type, the probes shall be readily demountable for inspection and shall be located so that all of the product contact surfaces are reached by rinse, wash and sanitizing solutions.

E.4.4
The carriage shall be constructed of smooth corrosion resistant material. Tires shall be smooth and without treads.

E.5
Filters

E.5.1
Filters shall conform to the 3-A Sanitary Standards for Milk and Milk Products Filters, Number 10-03.

E.5.2
Wire mesh or woven material shall not be used for the filter medium support.

E.6
Permanently Installed Milking Pipelines and/or Milk Conveying Lines Under Vacuum

E.6.1
Milking pipelines shall be self-draining, except for normal clingage, and shall have a minimum continuous slope of at least one inch per 10 feet (2.54 cm per 3.05 m) from a high point. (Also see Section E.6.7.)

E.6.2
The following must be provided in reverse flush (vacuum-gravity) system:

E.6.2.1
Means to easily disconnect the distal receptacle from the milking pipeline during the milking period. A sanitary cap shall be provided and used to cap the end of the milking pipeline during the milking period.

E.6.2.2
Facilities to pre-rinse the milk pipe at the distal end.

E.6.3
Milk inlets and milk inlet valves, where provided, shall be self-draining into the milking pipeline and/or milk conveying line and installed so that milk enters the upper half of the milking pipeline. All milk inlet valves shall be

supplied with closures which are readily applied and are of sanitary design.

E.6.4

The milking pipeline and/or milk conveying line couplings or union shall not be located in openings in walls, solid partitions, etc. through which the milking pipeline and/or milk conveying lines pass. Where necessary, protective shields shall be used. The openings between the pipeline and wall shall be protected to prevent the entrance of flies and other insects into the milkroom.

E.6.5

Milking systems shall be physically disconnected from the cleaning make-up vats during milking to avoid contamination by solution in the vat.

E.6.6

Milking pipelines shall be installed so that the vertical distance from the platform on which the cow stands to the center of the line does not exceed 7 feet (2.1 m) when milk is moved by vacuum directly from the milker unit assembly to the milk line. Milking pipelines should be kept as low as possible and where practical, milk hoses should not exceed 9 feet (2.7 m) in length.

E.6.7

There shall be no risers in the milking pipeline. Any upward slope encountered by the milk moving toward the receiver is considered a riser. Vertical sanitary pipes which do not conduct milk are not risers.

E.7

Vacuum Pumps: The exhaust pipe shall not terminate in a milking barn, stable, parlor, milk room or feed room.

E.8

Vacuum Regulators and Air Admission.

E.8.1

During the milking cycle, a regulator shall not admit air directly into the milking pipeline.

E.8.2

Air may be admitted into the milking pipeline and/or milk conveying line for purposes of "shut down" by valves or other acceptable means located in the milk room only. A valve for "shut down" purposes may not be installed in non-product contact lines unless a check valve is installed adjacent to the moisture trap and in such a manner that will permit air to travel only to the vacuum pump.

E.8.3

Air admission bleed holes, if provided, should be in the upper half of the claw or milk cup when it is in the milking position or in the teat cup assembly.

E.8.4

An air injector should be located to admit clean air into the pipeline during the washing process. The timing and air-to-water ratio should be adjusted so all surfaces are exposed to wash solution with enough turbulence to clean the system. The air injector shall be designed, installed and operated so that air is not admitted during milking.

E.9

Main Vacuum Supply Lines and/or Vacuum Pulsator Lines

E.9.1

Main vacuum supply lines and/or vacuum pulsator lines shall be supported in such a manner that the lines will properly drain.

E.9.2

Main vacuum supply lines and/or vacuum pulsator lines shall be pitched at least 1/2 inch in 10 feet (13 mm in 3.05 m) preferably in the direction of air flow.

E.9.3

An automatic drain valve or a self draining moisture trap shall be installed at the bottom of all risers which do not drain.

E.9.4

Stall cocks shall enter the upper half of the line.

E.9.5

In a pipeline milking system, a self draining moisture trap shall be provided whenever the milking pipeline or a wash vacuum pipeline is connected to a vacuum supply line. The trap shall be installed adjacent to the milk receiver, releaser, wash vacuum pipeline or vacuum bulk tank and connected by readily disassembled sanitary piping, except that sanitary flexible tubing may be used to connect the releaser and/or vacuum bulk tank to the moisture trap. The vertical rise of this connection shall not exceed 12 inches (30.5 cm) including the elbow. The connecting sanitary piping shall slope toward the trap at least 1/2 inch (13 mm) in the first 2 feet (61 cm). The trap shall be installed so that any liquid collected in the trap cannot get back into the receiver, releaser or vacuum bulk tank during milking.

E.10

Milk Receiver, Pump and Releaser

E.10.1

The milk level sensing device shall be designed so that milk will not reach the lowest inlet in the milk receiver.

E.10.2

When a centrifugal or positive rotary type milk pump is used to remove the milk from the receiver, it shall conform to the 3-A Sanitary Standards for Centrifugal and Positive Rotary Pumps, Number 02-08. The pump shall be located so that it is readily accessible for cleaning and/or inspection.

E.10.3

The pump shall be actuated by a level sensing device and, if of the probe type, the probes shall be readily demountable for inspection and shall be located so that all of the product contact surfaces are reached by the rinse and wash solutions.

E.10.4

A releasing mechanism, when provided, shall be of a design so that the milk will not reach the lowest milk inlet of the receiver during milking.

E.10.5

The pump and interconnecting piping shall be installed so that they are self draining. Drains shall terminate above the floor and not be connected to sewage lines.

E.11

Heat Exchangers

E.11.1
When plate heat exchangers are used as milk coolers in milking systems, they shall conform to 3-A Sanitary Standards for Plate Heat Exchangers, Number 11-04.

E.11.2
When tubular heat exchangers are used as milk coolers in milking systems, they shall conform to 3-A Sanitary Standards for Tubular Heat Exchangers, Number 12-05.

E.11.3
Other types of heat exchangers such as refrigerated receivers, if used as milk coolers in milking systems, shall conform with the applicable criteria in Materials Section C and Fabrication Section D of these 3-A Accepted Practices for Milking and Milk Handling Equipment, Number 606-03.

E.11.4
Recirculated cold water which is used in plate or tubular heat exchangers shall be from a safe source, non-toxic and protected from contamination. Such water shall be tested semi-annually and shall comply with the following bacteriological standards: An MPN (Most Probable Number) of coliform organisms of less than 2.2 per 100 milliliter (mL) by the multiple tube fermentation technique, or less than one (1) per 100 mL by the membrane filter technique.

F

MANUFACTURER'S INSTRUCTIONS

The manufacturer shall furnish instructional charts and literature on milking systems giving the maintenance schedules and operational instructions. This shall include the recommended assembly and disassembly procedures of all components. It shall also include lubrication and maintenance schedules of vacuum pumps, milk pumps, pulsators and vacuum controllers.

G

APPLICATION TO INSTALL PIPELINE MILKING SYSTEMS

G.1
Prior to the installation of a pipeline milking system, the producer shall first make application on a suitable form, as prescribed by the control authority, or in the absence of a required form, on a form as suggested herein (FORM 1). The producer shall provide the control authority with two copies of the necessary details and flow diagrams. Approval of the application shall be obtained prior to the starting of installation.

G.2
Changes in existing milking systems, affecting capacity or arrangement, shall be submitted to the control authority.

APPENDIX

NOTE: This appendix is an adjunct to the preceding sections of these practices. Its purpose is to provide supplemental information and guidance in the design, fabrication and installation of milking systems.

H

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.2 herein. When welding is involved the carbon content of the stainless steel should not exceed 0.08%. The first reference cited in C.2 sets forth the chemical ranges and limits of acceptable stainless steels of the 300 series. Cast grades of stainless steel equivalent to types of 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.

I

PRODUCT CONTACT SURFACE FINISH

Surface finish equivalent to 150 grit or better as obtained with silicon carbide properly applied on stainless steel sheets is considered in compliance with the requirements of Section D.2.1 herein.

J

PROCEDURES FOR TESTING SANITARY CHECK VALVE PERFORMANCE ON BUCKET-TYPE MILKER

J.1
This procedure has been devised to test the performance of the sanitary check valve on bucket-type milking machines using a laboratory installation of the vacuum system. The only variations in the vacuum system used in this test (See Figure 1) from that used on dairy farms are: (a) a stall cock between the vacuum pump and the controller, as a means of controlling the vacuum, and (b) location of a vacuum gauge between the two stall cocks to which the units are attached during the test. The test should be conducted in the following manner using only the facilities outlined in the accompanying drawing:

J.1.1
Set up pump, controller, trap and stall cocks as indicated in Figure 1.

J.1.2
Assemble two clean, dry milking machine units.

J.1.3
Start the vacuum pump. Attach the air hoses to the stall cocks and apply vacuum to both units. Adjust the vacuum and pulsator speed to those recommended by the manufacturer.

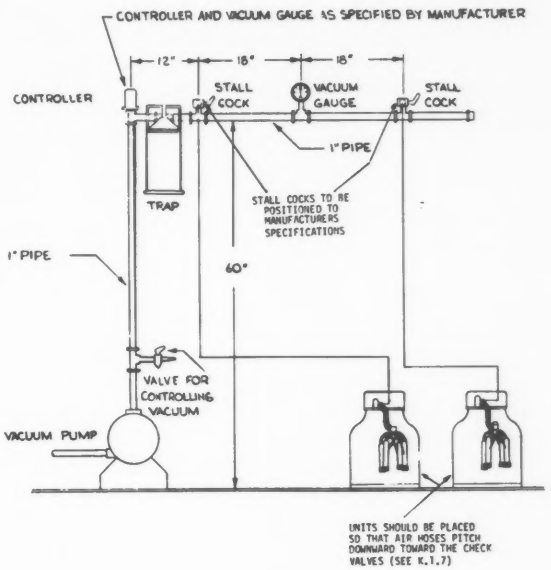
J.1.4
Reduce the vacuum in the system by opening the vacuum controlling valve at the pump until the needle on the gauge just starts to drop, not exceed 1/2 inch in mercury, below the normal milking vacuum recommended by the manufacturer. (See step J.1.3.)

J.1.5
While the units are under vacuum, inject 5 mL of water with a syringe into the air hoses of each unit, approximately 4 inches from the check valve.

J.1.6
Admit air through the teat cups to one of the units to produce a momentary 4 inch drop in vacuum (or the

[1][2][3] Available from ASTM, 1916 Race St., Philadelphia, PA 19103.

FIGURE 1
TEST EQUIPMENT FOR
EVALUATING CHECK VALVE PERFORMANCE



maximum drop permitted by the design of the machine), indicated on the vacuum gauge.

J.1.7

Close the stall cock to which the air hose of this unit is attached, remove the air hose, and release the vacuum in the pail in the normal manner. (The air hose must be maintained in a position favoring drainage toward the check-valve, as is the case when a unit is routinely moved from one stall cock to another.) The pail or container lid is not to be removed.

J.1.8

Immediately attach this unit again to the stall cock, open stall cock and re-establish the normal operating vacuum.

J.1.9

Follow steps J.1.6, J.1.7, and J.1.8 with the other unit.

J.1.10

Repeat steps J.1.5 to J.1.8 inclusive, alternatively with the two units, five additional times (so that 30 mL of water will have been injected into each air hose.) Then release the vacuum and carefully remove and examine the lid, the check valve, and the interior of the pail of each unit, separately. The presence of moisture on the underside of the check valve, on the underside of the lid, or in the pail indicate failure of the check valve to function effectively in preventing backflow of potential contamination and indicates non-conformance to the requirements of E.3.1.

K

MILKING UNIT RECOMMENDATIONS

The number of milking units that the milking pipeline in a pipeline system can handle satisfactorily depends largely upon the diameter and number of slopes of the milking pipeline. The following table gives the recommended maximum number of milking units that should be used on various installations. The number of units shown in the table is the number per slope.

Size of Milking Pipeline Installations	Recommended Maximum Units Per Slope
2 inch (5.1 cm) line	4
2 1/2 inch (6.4 cm) line	6
3 inch (7.6 cm) line	9

The diameter of the milking pipeline, if less than that given in the preceding table, should be demonstrated to be adequate by instrumentation. (See Appendix, Section Q.)

Note 1: When the number of units in use indicate the need for multiple slope lines, a multiple inlet receiver is recommended, or if the receiver has fewer inlets than the number of lines, it should be determined by instrumentation to be adequate.

Note 2: Weigh jars and all milk conveying lines should be exempt from these line size provisions. Weigh jars and looped lines should, however, be connected by means of separate sanitary lines, one to supply the vacuum to weigh jars only, the other to carry milk. Both lines should be mechanically cleaned.

L

VACUUM PUMP CAPACITIES — BUCKET MILKING SYSTEM

L.1

The minimum capacity of the vacuum pump(s) used in bucket-type milking systems should be 17 CFM (482 LPM) American Society of Mechanical Engineers (ASME) or 34 CFM (964 LPM) New Zealand as a base plus 2 CFM (57 LPM) (ASME) or 4 CFM (114 LPM) New Zealand per unit.

M

VACUUM PUMP CAPACITIES—PIPELINE MILKING SYSTEM

M.1

The capacity of the vacuum pump(s) used in a pipeline milking system should be (1) a minimum of 35 CFM (992 LPM) ASME or 70 CFM (1984 LPM) New Zealand or (2) should have a capacity at least as large as the recommendation of the milking machine manufacturer or (3) should be demonstrated to be of adequate capacity by a vacuum graph. (See Appendix, Section Q.)

M.2

The vacuum pump should be located near the milking barn, stable or parlor in a relatively clean, dry, non-freezing location.

M.3

Where the computed vacuum pump capacity for a pipeline milking system is determined to be less than the minimum CFM/LPM recommendations of 35 CFM (992 LPM) ASME or 70 CFM (1984 LPM) New Zealand, a

vacuum pump with a CFM/LPM capacity equal to or greater than the recommendation minimum should be installed.

M.4

A test port in the milking system should be provided in the main vacuum line near the vacuum pump. The fitting should be constructed so as not to interfere with normal air movement toward the pump. The test port diameter should be equal to or greater than the vacuum pump intake diameter. The test port may be a tee or wye fitting with a valve or other arrangement permitting easy measurement of vacuum pump capacity.

EXAMPLES OF MINIMUM VACUUM REQUIREMENTS, PIPELINE MILKERS
(VACUUM LEVEL 15 INCHES MERCURY)

Component	ASME Standard		New Zealand Standard	
	CFM	LPM	CFM	LPM
Milker Unit	6.0	170.0	12.0	340.0
Vacuum-operated Releaser	5.0	142.0	10.0	284.0
Vacuum Bulk Tank	2.0	57.0	4.0	114.0
Milk Meter with Air Bleeds	1.0	28.0	2.0	56.0
Milk Meter without Air Bleeds	0.0	0.0	0.0	0.0
Sanitary Couplings Per 20	1.0	28.0	2.0	56.0
Inlets Per 10 (Milk & Vacuum)	1.0	28.0	2.0	56.0
Reserve for Regulator (ea.)	3.0	85.0	6.0	170.0
Receiver Group and Milk Pump	0.0	0.0	0.0	0.0
Weigh Jar	1.0	28.0	2.0	56.0

SAMPLE CALCULATION #1

	ASME		New Zealand	
	CFM	LPM	CFM	LPM
16 Milker Units	96.0	2720.0	192.0	5440.0
Receiver Group & Milk Pump	0.00	0.00	0.00	0.00
40 Sanitary Couplings	2.00	57.0	4.00	114.0
16 Milk Meters with Air Bleeds	16.0	448.0	32.0	896.0
1 Regulator	3.00	85.0	6.00	170.0
TOTAL CFM/LPM REQUIREMENTS	117.0	3310.0	234.0	6620.0

SAMPLE CALCULATION #2

	ASME		New Zealand	
	CFM	LPM	CFM	LPM
3 Milker Units	18.0	510.0	36.0	1020.0
1 Milk Pump	0.00	0.000	0.00	0.00
20 Sanitary Coupling	1.00	28.0	2.00	56.0
8 Inlets	1.00	28.0	2.00	56.0
1 Regulator	3.00	85.0	6.00	170.0
TOTAL CFM/LPM REQUIREMENTS	23.0	651.0	46.0	1302.0

NOTE 1: Sample calculations #2 illustrates an example of a pipeline milk system where the computed CFM/LPM requirements, using the above table, is less than the recommended minimum CFM/LPM. Even though the calculated CFM/LPM requirement is 23.0/651.0 (ASME) or 46.0/1302.0 (New Zealand) a vacuum pump with a minimum capacity of 35.0 CFM/992.0 LPM (ASME) or 70.0 CFM/1984.0 LPM (New Zealand) should be installed.

NOTE 2: It is recommended that the primary vacuum system should operate only the components of the milking pipeline system. If there are vacuum operated accessories such as doors, gates, etc., there should be a separate vacuum system to operate them.

N

VACUUM REGULATORS

N.1

The vacuum regulator(s) should have sufficient capacity to admit air equal to the full capacity of the vacuum pump at operating vacuum. The sensitivity of the regulator should be such that there will be not more than one inch of mercury vacuum fluctuation in the system under normal operation conditions in a properly sized and maintained system as measured in the main vacuum supply line.

N.2

The vacuum controller should be installed between the first stall cock and the vacuum distribution tank in a bucket type installation. In a milking pipeline system the vacuum controller should be located on the vacuum distribution tank or in the main vacuum supply line as near the receiving vessel as possible, or as recommended. Vacuum controls located on horizontal main vacuum supply lines should admit air into the upper half of the line.

O

VACUUM DISTRIBUTION TANK

O.1

A self draining vacuum distribution tank should be provided.

O.2

The inlet and outlet connections should be at least as large as the vacuum line.

P

MAIN VACUUM SUPPLY LINES AND/OR VACUUM PULSATOR LINES

P.1

Pipe and fittings used in main vacuum supply line and/or vacuum pulsator line installations should be capable of withstanding vacuums of 25 inches of mercury without collapsing.

P.2

Adequate vacuum at the milking unit is essential. The minimum size of line should be that given in the table below, or if smaller, it should be demonstrated to be adequate by instrumentation. (See Appendix, Section Q.) The following table gives the recommended minimum size for main vacuum supply lines:

MINIMUM SIZES FOR MAIN VACUUM SUPPLY LINES FOR PIPELINE MILKING SYSTEMS (NEW INSTALLATIONS)

Number of Units	Pipe Size	
	Inches	CM
1 - 10	2	5.1
11 - 13	2 1/2	6.4
14 or more	3	7.6

MINIMUM SIZES FOR VACUUM PULSATOR LINE(S) FOR PIPELINE MILKING SYSTEMS (NEW INSTALLATIONS)

Number of Units	Pipe Size	
	Inches	CM
1 - 14	2	5.1
15 or more	3	7.6

P.3

Vacuum pulsator lines should be looped to (1) a vacuum distribution tank or (2) a vacuum pulsator header line. A single header line should be a minimum of one size larger than the pulsator line, unless the pulsator line is sized larger than the minimum size listed in P.2.

Q

MILKING VACUUM

The milking pipeline size recommendation (See Appendix, Section K.), the requirements of adequate vacuum pump capacity (See Appendix, Section M.), and the minimum diameter of the main vacuum supply line (See Appendix, Section P.), should be deemed to have been met if milking vacuum fluctuation does not exceed that recommended by the milking machine manufacturer. To demonstrate this, upon installation of a milking system, a performance evaluation (See Appendix, Section R.1.) should be made with all the milker units in milking operation simultaneously.

R

OPERATION, MAINTENANCE AND SERVICE

R.1

Service Check

It is strongly recommended that a complete service check and milking performance evaluation be performed by an authorized milking machine dealer on an hourly use basis as recommended by the machine manufacturer or at least once a year. The suggested test should include (1) operating vacuum level, (2) vacuum pump capacity, (3) system leakage and (4) unit consumption. It is highly desirable that a service report and milking system test report be supplied by the milking machine manufacturer and followed closely by their authorized dealer during the service check. A copy of the completed report should be furnished to the owner.

R.2

Vacuum System

The following recommendations, if followed, should aid in trouble free operation of the vacuum system.

R.2.1

Vacuum Pump

R.2.1.1

Use only oil recommended by the manufacturer, and maintain it at proper level. Change oil as frequently as recommended by the manufacturer.

R.2.1.2

Consult a qualified dealer and the control authority before adding units to a milking system.

R.2.1.3

Keep pulleys and belts free of oil and grease. Check the operator's manual for the proper belt tension. Keep shields and guards in place.

R.2.2

Check the pulsator(s) as recommended by the manufacturer to see that it is properly adjusted.

R.2.3

Check air tubes and main vacuum supply lines and/or vacuum pulsator lines weekly, and clean as needed. Any leak in the vacuum pipeline should be corrected immediately.

R.2.4

Check for vacuum leaks in all stall cocks, milk inlets, valves, gaskets and other fittings.

R.2.5

Check and clean vacuum controller and moisture traps weekly.

R.3

Milker Units

R.3.1

Teat cup liners or inflations should be changed as recommended by the manufacturer and damaged parts should be replaced immediately.

R.3.2

Only milk hoses and tubes and air hoses and tubes of the recommended inside diameter should be used. Hoses and tubes should be kept free of obstructions and kinks.

S

RELEASER

The operation of the releaser should not cause the vacuum in the system to drop more than one inch of mercury.

T

TRANSFER STATIONS

T.1

To prevent excessive agitation and incorporation of air into the milk, pump type stations should be equipped with level sensing devices to start and stop the pump motor. Vacuum operated stations should be equipped with check or ball valves for the same purpose.

U

CLEANING AND SANITIZING PROCEDURES

U.1

A rinsing, cleaning, and sanitizing regimen which has been demonstrated to be effective should be employed. Prior to installation, a description of the cleaning regimen that has been determined to be effective should be made available to the producer. Because of the possibilities of corrosion, the recommendations of the cleaning compound manufacturer should be followed with respect to the time, temperature, and the concentration of specific detergent solutions and bactericides. To insure proper

strength of solution and to avoid corrosion, the cleaning compound should be completely dissolved or dispersed prior to circulation. One regimen found to be satisfactory is as follows:

U.1.1

Immediately after concluding each milking, all connections between clean-in-place lines and milking equipment which are not included in the cleaning circuit are removed, the openings capped, by-pass connections made, and lines rinsed thoroughly with tepid water (90 to 105 degrees F or 32 to 40 degrees C, entering circuit) continuously discarding the water near the downstream end of the solution return line until the discarded effluent is clear.

U.1.2

All solution and product contact surfaces not cleanable by mechanical cleaning procedures such as valves, slip joints, milk inlets, etc. should be cleaned manually.

U.1.3

An effective detergent solution should be circulated for a period of time at a concentration and temperature capable of effectively removing the soil residue in the circuit.

U.1.4

The detergent solution should be thoroughly rinsed from the circuit with an acid solution.

U.1.5

Immediately prior to next milking, the line should be rinsed with clean water to which an approved sanitizing agent has been added. Then let drain before starting to milk.

U.2

Milker unit cleaning devices when installed outside the milk room, should be so constructed as to prevent insects, rodents, dirt, dust and other contaminations from gaining access to milk contact surfaces and solution contact surfaces. They should provide complete drainage, except for normal clingage, of milker units, milk hoses and solution contact surfaces. Provisions should be made for adequate warm water under pressure to be available for cleaning the outside or non-milk contact surfaces of the milker unit including hoses. Dismantling for replacing rubber parts and/or manual cleaning or product contact surfaces should be done in the milk room.

V

REFERENCES

V.1

3-A Sanitary Standards for Fittings Used on Milk and Milk Products Equipment and Used on Sanitary Lines Conducting Milk and Milk Products, Number 08-19, rev.

V.2

3-A Sanitary Standards for Polished Metal Tubing for Dairy Products, Number 33-00.

V.3

3-A Sanitary Standards for Multiple-Use Rubber and Rubber-Like Materials used as Product Contact Surfaces in Dairy Equipment, Number 18-00.

V.4

3-A Sanitary Standards for Multiple-Use Plastic Materials used as Product Contact Surfaces for Dairy Equipment, Number 20-15.

V.5

3-A Accepted Practices for Supplying Air Under Pressure in Contact with Milk, Milk Products and Product Contact Surfaces, Number 604-03.

V.6

3-A Sanitary Standards for Centrifugal and Positive Rotary Pumps for Milk and Milk Products, Number 02-08.

V.7

3-A Sanitary Standards for Plate Type Heat Exchangers for Milk and Milk Products, Number 11-04.

V.8

3-A Sanitary Standards for Tubular Heat Exchangers for Milk and Milk Products, Number 12-05.

W

APPLICATION TO INSTALL PIPELINE MILKING SYSTEMS

W.1

After an application has been made, as suggested in G, the applicant should be notified promptly of any necessary changes.

W.2

Each "type" of a manufacturer's standard unit may be made available by the dealer to the proper control authority's jurisdiction at anytime. It is recognized that any manufacturer's so-called standard does not fit all operating conditions of all users. Therefore if any installation requires deviations from the standard generally approved for use in the jurisdiction, the details of all deviations must be submitted with the initial application for installation, and approval received prior to the installation. It is urged that deviation details thus submitted be acted upon by the control authority promptly after being received.

W.3

It is recommended that all milk control authorities adopt an APPLICATION TO INSTALL FORM.

These Accepted Practices shall become effective March 20, 1990, at which time the 3-A Accepted Practices for the Design, Fabrication and Installation of Milking and Milk Handling Equipment, Number 606-02 are rescinded and become null and void.

FORM I

PRODUCER'S APPLICATION TO INSTALL A PIPELINE MILKING SYSTEM ON A DAIRY FARM

Name of Producer _____ Date _____

P.O. Address _____ Township _____ Tel. No. _____

Milk Dealer _____ Address _____

I HEREBY MAKE APPLICATION FOR PERMISSION TO INSTALL A PIPELINE MILKING SYSTEM. THIS EQUIPMENT WILL BE CLEANED-IN-PLACE.

1. Pipeline System: Make _____ Type _____ No. of Milker Units _____

   Pipeline length _____ Pitch _____ Diameter _____ Material _____

   Type of Releaser: (a) Electric (b) Vacuum (c) Magnetic Type of Pump _____

2. Washing Equipment:

   A. Heater pressure type _____ No. of Gallons or Liters _____

      Set at Temperature _____

   B. Equipment Designed for :

      a. Washing by recirculation _____

      b. Reverse flush washing _____

      c. All washing equipment in milk house _____

3. The following is a list of items to be manually cleaned daily:

4. Water Supply: Source _____ Analysis of Hardness _____ Grains

Detailed installation plan or drawing to be submitted with this form shall show (1) each circuit to be cleaned, noting thereon size and length of sanitary piping, fittings, pitch, drain points, and relative elevations, (2) each circuit of main vacuum supply line and/or vacuum pulsator line noting the size and length of piping and relative elevation, (3) location and capacity of cleaning and sanitizing solution circulation unit, (4) vacuum pump(s) capacity and other pertinent facts. A description of the cleaning and sanitizing regimen that will be followed shall be submitted with this form.
Note: Any modification of this equipment must be approved.

(Signed) _____

(Owner or authorized representative)

U.S. Postal Service

STATEMENT OF OWNERSHIP, MANAGEMENT AND CIRCULATION

Required by 39 U.S.C. 3685)

1A. Title of Publication	1B. PUBLICATION NO.	2. Date of Filing
Dairy, Food & Environmental Sanitation	1 0 4 3 3 5 4 6	9/30/89

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PO Box 701
502 E. Lincolnway, Ames, IA 50010

6. Full Names and Complete Mailing Address of Publisher, Editor, and Managing Editor (This item MUST NOT be blank)

Publisher (Name and Complete Mailing Address)

International Association of Milk, Food & Environmental Sanitarians, Inc.
PO Box 701, Ames, IA 50010

Editor (Name and Complete Mailing Address)

Margie Marble, PO Box 701, Ames, IA 50010

Managing Editor (Name and Complete Mailing Address)

Margie Marble, PO Box 701, Ames, IA 50010

7. Owner (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding 1 percent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a partnership or other unincorporated firm, its name and address, as well as that of each individual must be given. If the publication is published by a nonprofit organization, its name and address must be stated.) (Item must be completed.)

Full Name	Complete Mailing Address
International Association of Milk, Food & Environmental Sanitarians, Inc.	PO Box 701, 502 E. Lincolnway, Ames, IA 50010

8. Known Bondholders, Mortgagees, and Other Security Holders Owning or Holding 1 Percent or More of Total Amount of Bonds, Mortgages or Other Securities (If there are none, so state)

Full Name	Complete Mailing Address
None	

9. For Completion by Nonprofit Organizations Authorized To Mail at Special Rates (DMM Section 423.12 only)

The purpose, function, and nonprofit status of this organization and the exempt status for Federal income tax purposes (Check one)

(1) ☐ Has Not Changed During Preceding 12 Months ☐ (2) Has Changed During Preceding 12 Months (If changed, publisher must submit explanation of change with this statement.)

10. Extent and Nature of Circulation (See instructions on reverse side)	Average No. Copies Each Issue During Preceding 12 Months	Actual No. Copies of Single Issue Published Nearest to Filing Date
A. Total No. Copies (Net Press Run)	4200	4200
B. Paid and/or Requested Circulation 1. Sales through dealers and carriers, street vendors and counter sales	0	0
2. Mail Subscription (Paid and/or requested)	3318	3460
C. Total Paid and/or Requested Circulation (Sum of 10B1 and 10B2)	3318	3460
D. Free Distribution by Mail, Carrier or Other Means Samples, Complimentary, and Other Free Copies	24	24
E. Total Distribution (Sum of C and D)	3342	3484
F. Copies Not Distributed 1. Office use, left over, unaccounted, spoiled after printing	858	714
2. Return from News Agents	0	0
G. TOTAL (Sum of E, F1 and 2—should equal net press run shown in A)	4200	4200

11. I certify that the statements made by me above are correct and complete

Signature and Title of Editor, Publisher, Business Manager, or Owner: Margie Marble – Exec. Mgr.

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For more information contact :
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Ames, IA 50010
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102	115	128	141	154	167	180	193	206	219	232	245	258	271	284	297	310	323	336	349
103	116	129	142	155	168	181	194	207	220	233	246	259	272	285	298	311	324	337	350
104	117	130	143	156	169	182	195	208	221	234	247	260	273	286	299	312	325	338	351
105	118	131	144	157	170	183	196	209	222	235	248	261	274	287	300	313	326	339	352
106	119	132	145	158	171	184	197	210	223	236	249	262	275	288	301	314	327	340	353
107	120	133	146	159	172	185	198	211	224	237	250	263	276	289	302	315	328	341	354
108	121	134	147	160	173	186	199	212	225	238	251	264	277	290	303	316	329	342	355
109	122	135	148	161	174	187	200	213	226	239	252	265	278	291	304	317	330	343	356
110	123	136	149	162	175	188	201	214	227	240	253	266	279	292	305	318	331	344	357
111	124	137	150	163	176	189	202	215	228	241	254	267	280	293	306	319	332	345	356
112	125	138	151	164	177	190	203	216	229	242	255	268	281	294	307	320	333	346	359
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Coming Events

1989

DECEMBER

•**4, Pesticide Applicator Certification Seminar**, Okumura Biological Institute, Clarion Hotel, Sacramento, CA. Contact: George Okumura, 6669 14th St., Sacramento, CA 95831 916/421-8963.

•**4-6 Microbiology and Engineering of Sterilization Processes.** A three day course given at the University of Minnesota, St. Paul Minnesota Campus. For further information contact Dr. William Schafer, Course Coordinator, Department of Food Science and Nutrition, 1334 Eckles Avenue, St. Paul, MN 55108, 612-624-4793.

•**4-6, Bagels! Bagels! Bagels!** American Institute of Baking, Manhattan, KS. Contact: Melinda Enns at (913) 537-4750.

•**5-6, Pests Associated with Food Industry and Environmental Sanitation Seminar**, Okumura Biological Institute, Clarion Hotel, Sacramento, CA. Contact: George Okumura, 6669 14th St., Sacramento, CA 95831 916/421-8963.

•**5-6, "Establishing Hazard Analysis Critical Control Point (HACCP) Programs"** will be held at the Hotel El Rancho, Davis, CA in conjunction with University and Cooperative Extensions of the University of California at Davis. For more information call 202/393-0890, or write to The Food Processors Institute, 1401 New York Ave., N.W., Suite 400, Washington, DC 20005.

•**5-7, International symposium** to be held at Battelle in Columbus, Ohio. Registration material available from Phillip Wells, The Conference Group, 1989 West Fifth Avenue, Suite 5, Columbus, Ohio 43212, 614-424-5461, FAX 614-488-5747.

•**6-7, Starch: Structure, Properties, and Food Uses**, sponsored by the American Association of Cereal Chemists, will be held in Chicago, IL. For more information, contact: AACC, 3340 Pilot Knob Rd, St. Paul, MN 55121 (612) 454-7250.

•**7-8, Advanced Course on Pest Recognition and Food Industry Problems**, Okumura Biological Institute, Clarion Hotel, Sacramento, CA. Contact: George Okumura, 6669 14th St., Sacramento, CA 95831 916/421-8963.

•**18-20, In-Store and Retail Bakery Management.** American Institute of Baking, Manhattan, KS. Contact: Melinda Enns at (913) 537-4750.

1990

JANUARY

•**8-12, Technology of Bakery Production.** American Institute of Baking, Manhattan, KS. Contact: Melinda Enns at (913) 537-4750.

•**8-12, Electrical Troubleshooting.** American Institute of Baking, Manhattan, KS. Contact: Melinda Enns at (913) 537-4750.

•**9-11, The Second Annual "Technology and Regulatory Developments Conference"** focusing on "HACCP", held in San Antonio, Texas. For more information contact the Communications department, the National Fisheries Institute, 2000 M St., NW Suite 580, Washington, DC 20036, (202) 296-3428.

•**15-26, Baking for Allied & Non-Production Personnel.** American Institute of Baking, Manhattan, KS. Contact: Melinda Enns at (913) 537-4750.

•**17-19, 5TH Annual Biotechnology Process Engineering Symposium** at the Massachusetts Institute of Technology. For more information contact: Biotechnology Process Engineering Center, Conference Coordinator, M.I.T., Room 20A-207, Cambridge, MA 02139.

•**17-20, Sixth Annual U.S. Dairy Forum** at the PGA Sheraton Resort in Palm Beach Gardens, Florida. For more information contact the Milk Industry Foundation, 888 Sixteenth St. N.W., Washington, D.C. 20006, 202/296-4250.

•**29-31, Baking Production Technology.** American Institute of Baking, Honolulu, HI. Contact: Melinda Enns at (913) 537-4750.

•**29-Feb. 1, Basic Food Processing Sanitation.** American Institute of Baking, Manhattan, KS. Contact: Melinda Enns at (913) 537-4750.

FEBRUARY

•**5-June 15, Baking Science and Technology #136.** American Institute of Baking, Manhattan, KS. Contact: Melinda Enns at (913) 537-4750.

•**5-9, Specialized Cookie.** American Institute of Baking, Manhattan, KS. Contact: Melinda Enns at (913) 537-4750.

•**12-16, Bakery Management.** American Institute of Baking, Manhattan, KS. Contact: Melinda Enns at (913) 537-4750.

•**13-14, 79th Annual Oregon Dairy Industries Conference** held at the Hilton Hotel, Eugene, OR. For more information call Floyd W. Bodyfelt, 503-737-3463.

•**19-21, ABC Research 16th Annual Technical Seminar**, University Centre Hotel, Gainesville, FL 32608. For additional information contact Sara Jo Atwell, 904-372-0436.

•**24-28, The Texas Public Health Association's 65th Annual Meeting** in Austin, Texas at the Hyatt Regency Hotel on Town Lake. Contact either Ms. Terri Pali, TPHA Executive Secretary, (512) 451-1846, or Jim Allen, Chairman Exhibit Procurement Committee, (512) 458-7500.

From the Ames Office . . .

By
Steven K. Halstead
IAMFES
Executive Manager

I guess it was a natural question, but I was a bit taken aback. "Well, what did you think of your first IAMFES Annual Meeting?" It didn't come just once, but several times. I was never quite sure how to handle it.

To be honest, it didn't hold a candle to the American Dental Association (ADA) meetings I attended. But then, their registration was over 26,000 and they had over 600 exhibits.

With those kind of numbers, you can do lots of things that you can't do with 800 attendees and 65 exhibitors. But wait just a minute, we can do some things with our numbers that the ADA will never be able to do.

For one thing, you can be treated like an individual and not just a number. The exhibitors can spend the time with you to really tell you about their product. The speakers are willing to talk with you about their paper. And, we can be friendly.

As we plan for the 1990 version in Chicago (the planning actually started in 1987), we will be changing some aspects. The social events will take advantage of the Chicago mystique. The exhibits will reflect some of the suggestions made by the exhibitors. The speakers will update you with information that isn't even available right now.

There are some things we will never change. They are listed in the fourth paragraph.

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C I A

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TEST SENSITIVITY (PPB)

ANTIBIOTIC GROUP	INDIVIDUAL MEMBER	CHARM II TEST	Disc Assay	
			CIA	BST
Beta-lactams	Benzylpenicillin	2	3	3
Sulfonamide	Sulfamethazine	5	10	15,000-20,000
Tetracycline	Tetracyline	250	250	800
Marcrolides	Erythromycin	20	200	200
Chloramphenicol	Chloramphenicol	50	3000	10,000

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