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# Food Protection Program Managers Identify Obstacles to Effective Retail Food Law Enforcement

David Z. McSwane, H.S.D., James A. Palmer, J.D.,  
Frank J. Vilardo, Dr. P.H., and Eric L. Mitter, M.P.A.

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Food protection has been a cornerstone of most public health programs since the early part of the 20th Century. Efforts to ensure a safe and wholesome food supply have centered around the retail and manufacturing components of the industry, and for the most part, retail food protection has been the responsibility of state and local public health departments in the United States.

Researchers at Indiana University's School of Public and Environmental Affairs recently concluded a study of forty-seven health jurisdictions to identify intrinsic and extrinsic factors in the food regulatory system that can hinder the achievement of compliance with retail food protection standards and requirements. The study was sponsored by the United States Food and Drug Administration (FDA) under Contract No. 223-83-2389, "Compliance Procedures for Local Government Programs."

Jurisdictions were nominated for participation in the study by FDA Regional Food Specialists and selected by the study team, with FDA approval, on the basis of the population of the jurisdiction, the type of governmental unit, and the quality of the retail food protection program.

Because the primary thrust of the study was to aid local health agencies with their retail food regulatory activity, approximately 96% of the agencies selected for inclusion in the study population had municipal, parish, county, or multi-county jurisdictions. To ensure that proper attention was paid to smaller jurisdictions, one-half of the county, district, and municipal agencies studied served a population of under 100,000 citizens. An attempt was also made to achieve geographic representation by selecting at least two jurisdictions from each of the 10 Food and Drug Administration regions in the United States.

## Methodology

The primary method for data collection was in-depth telephone interviews with key personnel in each regula-

tory system included in the study. A detailed interview guide for conducting the interviews was developed with input from representatives of the FDA and a Project Advisory Committee comprised of regulatory and legal professionals who were knowledgeable in the area of retail food protection. The basic interview guide consisted of questions pertaining to the operation of the retail regulatory food protection system. Two versions of the interview guide were prepared: an "interviewee copy" containing basic questions to be asked of interview subjects in each jurisdiction and an "interviewer copy" containing the basic questions and a number of follow-up questions concerning the interview subject's assessment of the adequacy of the regulatory system and his recommendations for improvement of the system. The interviewee copy was mailed to each study participant several days in advance of the actual telephone interview to ensure each had adequate time to compile the required information and consider the issues in-depth before formulating an answer or opinion.

In addition to the interview guide, each agency was asked to complete a data sheet which solicited quantitative information dealing with such variables as size of population served, program/agency budget, personnel information, professional staff workload, number and types of non-court legal actions taken as a result of an inspection, number of charges filed in court against retail food providers and the outcome of these cases, penalties applied in the court cases, other court actions against retail food violators (i.e., injunctions), and finally court action, if any, against the regulatory agency. The primary purpose of the data sheet was to collect quantitative information which could be used to make simple comparisons among the jurisdictions studied.

In order to obtain a complete perspective on the efficiency of the operation of the retail food regulatory system in each jurisdiction, interviews were planned with those individuals who had an important role in the system and



others who, because of their familiarity with the system, could be considered knowledgeable observers. Whenever possible, interviews were scheduled with the manager of the food protection program, the head of the regulatory agency that included the program, field enforcement personnel, the legal adviser for the program, an administrative hearing officer if provided for, the prosecutor in administrative proceedings, the judge who tried retail food violation cases, prosecutors who conducted the prosecution in retail food violation cases, managers of the retail food protection program in the state where the jurisdiction was located, a spokesperson for an association representing retail food operators, and the FDA Regional Food Specialist in the region where the jurisdiction was located.

Since many of the jurisdictions in the study population did not have individuals serving in each of the professional positions noted above and because interviews could not always be obtained from each category of professional, the information presented in this article is a summary of the input received from the managers of the retail food protection programs.

### Findings

#### Adequacy of State Statutes as a Basis for the Enforcement of State Food Protection Regulations and Local Ordinances

The primary sources of law for the regulation of retail food establishments in the jurisdictions studied were:

- State statute or state agency regulation (49%).
- Local ordinance or regulation only (19%).
- Combination of state law or regulation and local ordinance (32%).

As a general rule, the state statutes that are the basis for the adoption of regulations by state-level health agencies and the adoption of ordinances or regulations by local governmental units or health agencies are perceived to provide adequate enabling authority to adopt necessary codes and regulations concerning the preparation, service, display, and overall provision or sale of food to the public. Where control by local ordinance or regulation was permitted, the local law was essentially the same as or in some cases more stringent than existing state requirements.

Interviewees from most jurisdictions believed they had adequate statutory foundation for regulating retail food activities and had adequate powers to enforce the provisions of the retail food laws.

Each retail food protection program had an enforcement approach that it applied against retail food providers who failed or refused to comply with the retail food laws in the jurisdiction. All programs attempted to achieve voluntary compliance through a variety of informal methods, such as education, consultation, informal conferences, "pre-hearings," threats of formal legal action, and adverse publicity. The differences in enforcement philosophy become apparent when the program is confronted with

operators who repeatedly fail or refuse to comply after informal methods have been tried. There are at least five enforcement approaches that exist:

- *Informal action only.* Some jurisdictions never choose to use formal legal actions, but rather opt exclusively for informal methods. Possible legal action may be hinted at or even threatened, but is never taken. The inducement of "voluntary" compliance without resort to formal action is sought. These jurisdictions usually claim that the informal approach is very successful and formal action simply is not necessary.
- *Administrative action only.* Administrative action - formal action by the regulatory agency to consider withdrawal of a provider's permission to operate -- was the most common approach taken, and many jurisdictions use this type of action, coupled with informal methods.
- *Criminal action only.* Few jurisdictions choose to file criminal or quasi-criminal charges as the sole type of legal action to be taken against non-complying providers.
- *Civil action only.* Very few jurisdictions used civil actions alone (usually injunctive relief) as a primary means to secure compliance after less formal approaches had failed.
- *Administrative action and court action.* A substantial number of jurisdictions employ both administrative and court actions. With this comprehensive approach, a jurisdiction uses most or all of its authority, both formal and informal, against non-complying providers. Only a very few local food protection programs employed all three enforcement strategies (administrative, criminal, and civil) in order to gain compliance with the appropriate regulations.

In a somewhat different vein, program managers indicated they had experienced occasional difficulty in getting needed changes to existing statutes, ordinances, and regulations. While the legislative and rulemaking bodies in most jurisdictions were considered responsive to the needs of the retail food regulatory agencies, the time required to get amendments to the law promulgated and the political nature of the revision process were considered hinderances by the interviewees in some jurisdictions.

### Excessive Workload

The single most frequently mentioned problem confronting retail food regulatory programs was the limited number of field enforcement staff available to perform the required inspections for all regulated food establishments. This difficulty is manifested in a reduced amount of time available to conduct each inspection (which in turn may affect the quality of the inspection), a lower frequency of routine inspections, and an inability to perform follow-up inspections where problems have been noted.

The problem of increased workload is epitomized by

the responses of two food regulatory program managers. The first remarked, "There has been a fifty percent increase in the number of retail food outlets over the past several years, but no new staff positions have been created within the food protection program." In another jurisdiction, the program manager responded that his staff could not achieve the minimum number of annual inspections as required by state law. Repeated attempts to get larger fiscal appropriations and more staff resulted instead in an amendment to the law that replaced the mandated minimum number of inspections with the word "occasional."

The comments of program managers about this problem were borne out by an analysis of workload measures conducted by the study team. As summarized in Table 1, effective programs were found to have fewer establishments assigned to each inspector, higher inspection frequencies per establishment, and a lower number of annual inspections per field enforcement staff.

TABLE 1. Basic workload measures (mean values) by jurisdiction type.

Workload Measures	Effective	Ineffective
Establishments per 10,000 population	66.1	58.4
Establishments per field enforcement person (FTE)*	217.9	339.5
Annual inspections per field enforcement person (FTE)*	700.8	860.5
Annual inspections per establishment	3.2	2.8

\*Full Time Equivalent.

#### Inability to Use Informal Enforcement Methods

A separate problem, but one related to the volume of work, was the lack of sufficient staff time to use informal enforcement methods. Most program managers agreed that formal action, either administrative action or the filing of court actions, was the least desirable enforcement strategy and that the best method for achieving compliance was voluntary cooperation by the retail food operators. Successful methods used to achieve voluntary compliance included informal hearings, discussions between facility managers and employees when violations were found, and training of food service workers and managers in sanitation so they understand the law and know how to avoid problems. The sheer volume of work, in terms of facilities that had to be inspected, severely curtailed the staff time available in many jurisdictions to use these and other informal methods. Many food program managers believed their agencies were in a reactive mode of operation, responding to problems as they arose, when they would have preferred to adopt a preventive approach and work to avoid problems in the first place.

#### Inadequate Funding and Compensation

Another aspect of the "volume-to-work" dilemma was the inadequate level of funding for food protection programs in some local jurisdictions.

Funding is not the solution to all of the problems experienced by food protection programs; however, an analysis of fiscal resources showed that effective programs had budgets that permit the employment of more field enforcement personnel at higher salaries than do less effective programs. One-half of the program managers who were interviewed during the study indicated that salary levels were frequently not adequate to attract and retain competent personnel over the long run.

#### Staff Turnover

Most program managers indicated that staff turnover was not a paramount problem at the present, but they attributed this to general economic conditions in the nation and the lack of employment opportunities elsewhere. Nonetheless, several managers remarked that their program was an "up-and-out" training ground, where new college graduates were hired at a low salary, were trained in sanitation, worked for two years or less, and then sought employment elsewhere at a higher salary. A majority of the program managers were frustrated at not being able to match the salaries offered by organizations in the private sector and thus frequently had a staff dominated by inexperienced, entry level environmental health specialists.

#### Multiple and Overlapping Regulation

A majority of the retail food protection program managers identified a growing tendency toward multiple laws, licensing requirements, and agencies governing the health and sanitation aspects of a single foodservice operation and the concurrent trend within the retail food industry to provide a variety of types of food service operations within a single establishment as posing increasingly important problems in food protection. In several jurisdictions, establishments with multiple retail food services were required to hold several licenses, and different areas of the same facility were covered by different laws and regulations. In some states, more than one regulatory agency had the responsibility for regulating different components of the same facility, and operators were confronted with multiple inspectors who evaluated the various aspects of their operation at different times using different criteria. Nationwide, multiple and overlapping regulation appears to be a growing source of confusion and difficulty.

#### Lack of Written Legal Guidance

Most retail food program managers recognized a need for additional written legal guidance and tools to provide

direction to their field enforcement personnel. In most jurisdictions, copies of the food laws and regulations were the only documents available that could be construed as being "guidance"; however, some agencies had developed enforcement and inspection procedures as part of a program policies and procedures manual. Standard written policies and guidelines are needed to provide direction to field enforcement staff concerning:

- Their legal authority and duties.
- Proper enforcement and inspection procedures to ensure that due process is provided and arbitrary or inconsistent action is avoided.
- Interpretation of retail food laws and regulations.
- Administrative hearing and court procedures.

#### **Adequacy of Working Knowledge and Skills of Regulatory Agency Personnel Concerning Their Legal Authority and the Legal System**

Retail food protection program managers and staff, as a general rule, appeared to be well informed about their powers and authority and the legal tools available to enforce retail food laws. In most jurisdictions, the text of the laws and regulations served as the primary source of legal guidance for the program's field enforcement personnel.

Even though food program personnel generally had an adequate knowledge of their legal authority and available legal tools, most jurisdictions desired additional guidance on legal procedures for enforcing retail food protection laws, especially the more formal processes for taking action against non-complying retail food operators.

Skill development in the use of available legal powers and tools was generally dependent on the frequency with which a regulatory agency used a particular compliance method or enforcement strategy. Regulatory agency personnel were most proficient at those activities which they performed regularly -- licensing procedures, inspections, and facility plan review -- and were less proficient and less comfortable with activities that were seldom performed, which in many jurisdictions included those activities associated with court proceedings and administrative hearings.

Regulatory agency personnel in nearly all jurisdictions were deemed to be knowledgeable of their legal authority and the legal tools available to them and, as a general rule, they were judged to do an adequate job of applying this knowledge.

Program personnel, as would be expected, were perceived to be more proficient in the application of their legal authority and available enforcement techniques if they had regular opportunities to use the particular enforcement strategy and associated legal tools.

#### **Relationship with Regulatory Agency Counsel and/or Prosecutor**

All of the retail food protection programs had a legal

adviser available to provide legal assistance to the program. This adviser usually was the individual, or one of his assistants, who prosecutes retail food law violation cases for the program and typically was the city or county attorney, depending on the jurisdiction of the program.

Very few regulatory agencies had a full-time legal adviser, and due to the multiple demands on the time of the individual serving in a part-time advisory capacity, legal assistance was provided only intermittently on an "as needed" basis. The regulatory agency typically requested assistance with specific problems or in specific cases, and the legal adviser responded to the agency's specific problem. Legal advisers were used only if the regulatory agency recognized a need or potential legal problem, and the legal adviser only reacted to the agency's perceived needs. This arrangement, while usually satisfactory to the agency, is not the most desirable for the food program. Legal advice and assistance should be provided before specific needs or problems arise to ensure that legal problems are prevented.

The regulatory agency's needs for legal assistance can be fulfilled most effectively if the legal adviser is an attorney, is knowledgeable about public health law and the operation of the retail food protection program, and is a single individual, regardless of the agency that employs him, assigned to work with the food program on a continuing basis.

There were two types of prosecutors that worked with the regulatory agency in most jurisdictions.

- Administrative prosecutor who represented the regulatory agency in administrative hearings to consider license action against non-complying retail food operators.
- Court prosecutors who represented the regulatory agency in civil or criminal proceedings against retail food law violators.

The individual who served as the "administrative prosecutor" varied from jurisdiction to jurisdiction. Many were attorneys who also served as the retail food protection program's legal adviser, but several jurisdictions used non-attorneys, someone working in the food protection program, such as the field enforcement person who conducted the inspection and developed the case against a particular food operator. Regardless of who served as the administrative prosecutor, most jurisdictions found that the prosecutor worked well with the regulatory agency, had a positive attitude toward retail food protection, and did an adequate job in license action hearings. There was no indication that attorneys did a better job than non-attorneys in presenting the regulatory agency's case in an administrative hearing process.

The individual responsible for representing the regulatory agency in court, either for the prosecution of criminal or quasi-criminal charges against the food law violator or for seeking injunctive relief, also varied from jurisdiction to jurisdiction. The city or county attorney, depending on the jurisdiction, typically was charged by law with representing the agency in court. A majority of the local

retail food program managers in the jurisdictions studied thought that the prosecutor and his designated deputies or assistants did an adequate job in court in retail food violation cases, and most considered their relationship with the prosecutor to be cooperative and harmonious.

The major factors that influence how retail food violation cases will be handled are the attitudes and policies of the prosecutors, and to a lesser extent the judges, involved in the prosecution, adjudication, and sentencing of retail food law violators. Court remedies, which are seldom sought in most jurisdictions, are considered by many regulatory personnel to be too time-consuming and complicated to be used very frequently; however, the time and procedural requirements involved in retail food violation cases are not unique. The criminal justice system in most jurisdictions does not operate to expedite or impede the resolution of food law misdemeanors any differently than for other types of misdemeanors.

If the purpose of filing criminal or quasi-criminal charges is to get immediate compliance with food protection requirements, the criminal justice process is not always the most efficient and prompt method to achieve this objective. Justice is reasonably swift in most jurisdictions; however, the criminal justice process, with its built-in constitutional and statutory protections for defendants who are subject to a possible term of imprisonment, usually operates more slowly than regulatory agency personnel would like. Some delay is inherent in the process and is not necessarily undesirable. A major problem noted in a number of larger jurisdictions was the lack of continuity in the individuals, including both assistant prosecutors and judges, who handle retail food law cases. In most cases, retail food violation cases were assigned on a random basis without regard for the special knowledge and expertise required or for the need for a consistent, firm approach to be taken against operators who present significant public health threats. This problem of continuity may not be easily resolved, especially when the cause is the frequent turnover of assistant prosecutors, who often see prosecutorial work only as an opportunity for trial experience rather than as a long-term career.

A cooperative prosecutor with a positive attitude toward the enforcement of retail food laws and good relationship with the retail food protection agency is essential if criminal or quasi-criminal remedies are to be used successfully against food law violators. An uncooperative prosecutor who does not consider retail food violation cases to be sufficiently serious to warrant court action can preclude the use of court-related remedies as an enforcement strategy against non-complying retail food operators.

The prosecutors, in most jurisdictions, had absolute discretion over which cases to prosecute, and most prosecutors exercised their right to decline to prosecute some individual law violators or classes of violators.

### Recommendations

1. On the job training or inservice training in the

application of available enforcement techniques should be provided in order to make enforcement personnel more proficient and comfortable in the application.

2. A full complement of qualified professional staff is fundamental to program effectiveness. Adequate staffing results in a more manageable workload in terms of regulated establishments assigned per full time equivalent field enforcement person. By having responsibility for fewer facilities, professional staff members are able to devote more time to performing in-depth inspections and solving problems identified during these inspections. In addition, a reduced workload enables program staff to spend more time conducting non-inspection activities, such as facility plan review, and sanitation training for food-handlers.

3. Because prosecutor cooperation is vital to the overall success of the food protection program, it may be necessary to take steps to overcome prosecutor reluctance to prosecute retail food law violation cases or to use the court process to induce compliance. Some things which a health department can do to gain the cooperation of the local prosecutor and other legal personnel include:

- Sponsor or provide training for prosecutors and other legal personnel in the non-legal aspects of food protection and sanitation and the need for the retail food protection program to use formal legal action when other compliance strategies have failed. This training could be provided at the local level or as part of a statewide program.
- Request the assistance of the prosecutor in the training of regulatory agency personnel in the operation of the court system, evidentiary requirements, and proper comportment of witnesses, which will require that the prosecutor develop some familiarity with the retail food code and the role of the regulatory agency and will give the agency an opportunity to "educate" the prosecutor as to the need to prosecute retail food law violators.
- Invite the prosecutor to accompany program staff on an on-site inspection of the facilities of one or more retail food operators who the local program thinks should be prosecuted to learn first-hand the public health threat that is posed by the non-complying operators.
- Solicit the intervention of the prosecutor's peers, that is, respected prosecutors in other jurisdictions who routinely prosecute retail food violation cases, to share their reasons for taking court action in these cases.
- Seek legislative changes to permit the retail food program's attorney or legal adviser to serve as prosecutor in retail food violation cases. This may require only that retail food violations be reclassi-

fied as "civil violations" rather than criminal offenses.

- Request the assignment of a single deputy or assistant prosecutor to handle retail food violation cases, especially an individual who has a positive attitude toward and understanding of public health cases and is not reluctant to file charges against retail food violators.
- Suggest the use of a pre-trial division program for retail food violators if the prosecutor is not willing to take retail food cases to trial. Appropriate incentives, including dismissal of any charges, could be offered to violators who meet the requirements of the retail food protection program.

4. The state retail food protection program should develop written legal guidance, with the participation of its legal adviser. These guidelines should address those topics and issues that apply to all local food protection programs within the state's jurisdiction. The local food program's legal adviser or the food protection program manager, with the assistance of the legal adviser, should act to provide needed legal guidance to meet the special needs of the local program staff, especially if the state has not provided any form of guidance. Periodic updating of these legal guidelines is required to ensure the regulatory

system is conforming with the latest case law and judicial opinion.

### Summary

The rationale for the use of a particular enforcement approach appears to be whether, in any given jurisdiction, the approach is perceived as being appropriately effective in inducing compliance when other efforts have failed or in penalizing appropriately the most serious retail food law violators. All jurisdictions reported a high degree of success (approximately 90% of all cases) in securing voluntary compliance through methods that do not require formal legal action, and most retail food protection program managers considered the "threat" of legal action to be a very effective enforcement technique. While there is some indication that jurisdictions with effective retail food protection programs are more likely to initiate legal action -- either administrative hearings or criminal charges -- than those jurisdictions with ineffective programs, it is not known at this time whether the use of formal legal action is necessary in order to have an effective program or what combination of informal and formal actions must be taken to achieve desired levels of compliance with retail food law requirements.

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## Giardiasis Associated With A Mains Water Supply

T.B. Dickens, Divisional Environmental Health Officer  
M.H. Huggins, Principal Environmental Health Officer

Giardiasis is an infection principally of the upper small intestine caused by *Giardia lamblia*, from a flagellate protozoan. Diagnosis is made by cysts in faeces. While often asymptomatic, the infection may be associated with a variety of intestinal symptoms such as chronic diarrhoea, abdominal cramps, bloating, fatigue and weight-loss. Malabsorption of fats or fat-soluble vitamins may occur in severe giardiasis. The infection occurs worldwide, with children being more frequently affected than adults. Prevalence is higher in areas of poor sanitation in temperate as well as tropical countries. Localized outbreaks occur from ingestion of cysts in faecally contaminated water and, less often, from faecally contaminated foods. There have been frequent infections of tour groups related epidemiologically to drinking tap water. Person-to-person transmission occurs by the faecal-oral route. The reservoir of infection is man, wild and domestic animals. The incubation period is 5-25 days or longer, on average around 14 days.

On Monday, 29 July 1985 Bristol's Environmental Health Department received a message from the Control of Infection Service that the local Public Health Laboratory had isolated a much larger than usual number of *Giardia lamblia* cysts from stool specimens in the previous week, writes T.B. Dickens and M.H. Huggins. The individuals concerned were mainly middle-aged women and all had addresses in the south of the City. Coincidentally, the Medical Officer for Environmental Health (MOEH) had received a telephone message from a South Bristol General Practitioner that she was seeing an increased number of patients who were complaining of symptoms of prolonged diarrhoea.

The Public Health Laboratory in Bristol routinely screens all faecal specimens for the presence of *G. lamblia* and the normal isolation rate for the City (population 400,000) is 1-2 per week. Thus 10 isolations in one week from one area of the City indicated that perhaps something unusual had happened.

On receipt of these notifications, arrangements were made for an Environmental Health Officer to visit all the positive cases the same day. A pro-forma was drawn up and the patients were questioned about date of onset of symptoms, type of symptoms, duration of symptoms, whether anyone else in the family had symptoms, pet ownership, whether they went swimming, normal sources of fruit, vegetables and ice-cream, and water consumption.

Preliminary analysis of the findings failed to

produce any definite common link except that most of the dates of onset of symptoms appeared to be the middle of July and consumption of water in the home straight from the tap featured in many but not all the cases. Arrangements were made with the Public Health Laboratory that any future *G. lamblia* isolations would be telephoned directly to the Control of Infection Service so that they could be followed up immediately.

Interest now centered on the possible role that the water supply could have played in the incident, and contact was made on 30 July with the Bristol Waterworks Company. They were told of the number and location of cases and were asked to consider the possibility of connection with the water supply. Arrangements were made for a meeting between the MOEH, the Director of the Public Health Laboratory, Bristol Waterworks Company and the Environmental Health Department.

### Links with reservoirs

By the time the meeting was held the number of notifications had reached 19, all living in the same geographical area of the City. The extra 9 had also been interviewed and the findings were similar to those from the first 10. The water company had meanwhile established that most of the cases all lived on one specific water distribution system fed by 2 service reservoirs at Highridge. The zone serves a population of about 25,000 and the average daily water consump-

tion is about 5 Megalitres (MI). The storage capacity of the reservoirs is 3.4 MI, and the throughput represents a complete turnover at least once a day.

The reservoirs are supplied directly from Barrow Treatment Works and also by taking about 1 MI/day from the main which carries water from Purton Treatment Works to parts of South Bristol. Although this main traverses the Highridge zone it is not connected into its distribution networks. The Barrow Treatment Works treats water by microstaining, slow sand filtration and super/dechlorination. Only about 6 per cent of its output goes into the Highridge zone.

A sampling program involving water samples from the houses of the 19 confirmed cases to be taken by Environmental Health Staff and a further 20 samples taken at random from the distribution zone by the Waterworks Company was agreed. These samples were only examined for the presence of coliforms and all were found to be satisfactory. Bristol Waterworks had also checked their records for the period of 15 June to the 6 July and found that the routine weekly samples from the service reservoirs and six random samples from houses in the zone were all bacteriologically satisfactory.

The company also examined their records of all work carried out on the zone during the same period. Eight jobs were listed of which 6 involved work on consumer services and their nature and location ruled out any possibility of involvement in any contamination. One further job consisted of the repair of a leaking 3 inch main on the 28 June. This work was considered not to have contributed in any way to the outbreak.

The remaining job consisted of the cutting of the 15 inch and 8 inch outlet mains from the reservoirs and installing a cross-connection and a pressure-reducing valve. This work involved the main being isolated and drained down on 1, 5 and 8 July for a period of between 1 and 6 hours. Working conditions on the site were said to be ideal, and the work was carried out by a contractor of long-standing using experienced labour. Arrangements were made for the men working on the site to be tested for *Giardia*. Also soil samples from the excavation were similarly tested. All samples were negative.

### String filters

Arrangements were also made for string filters to be fitted in various sections of the mains zone. Several thousand gallons were filtered on each occasion and the filtrate examined for the presence of *Giardia* cysts. Water samples were also taken from the bottom of domestic storage tanks in 6 houses where there were confirmed cases and similarly examined. Again all samples were negative. Wessex Water Authority were also contacted and samples were taken from streams in the area and examined for *Giardia* - again the results were negative.

Contact was made with the Ministry of Agriculture,

Fisheries and Food with regard to any known incidence of *G. lamblia* in the wildlife population, foxes being particularly prevalent in this area. Checks were also made with the Avon Fire Service and City Council street cleansing service as to whether any connections had been made to hydrants in the area, for water abstraction. Additionally, local veterinary practices were contacted with regard to the incidence of *G. lamblia* or significant incidence of gastrointestinal infection in domestic dogs or cats in the same area. All these lines of enquiry proved to be negative.

### Isolations reported

Meanwhile reports continued to be received of *Giardia lamblia* isolations from the Public Health Laboratory. A total of 108 cases were reported with onset dates of between 3 June and 12 August with a peak between 14 and 17 July. *Figure 1* shows a histogram of the dates of onset of confirmed cases for those people who were able to state their date of onset of symptoms with any certainty.

The nature of the outbreak and its apparently close relationship with the mains water supply suggested that a case control study should be implemented. The Communicable Diseases Surveillance Centre assisted in preparing a questionnaire, and collected and collated the resultant data. The questionnaire sought information concerning clinical histories, together with details of food and water consumption and other risk factors such as contact with pets, foreign travel and environmental contact with water.

The inquiry was conducted by post, the questionnaire being sent to 68 affected cases, each of whom resided in the area, and at the same time to 109 adult controls not known to be affected and selected by a 1:250 systematic random sample from the Electoral Register for the Wards implicated in the outbreak. The case study yielded a remarkably high return of 141 out of 171 (79.6 per cent). The response rate for cases being 94 per cent and that for the controls being 70 per cent.

The results of the study indicated that there was no relationship between illness and foreign travel or with environmental contact with streams or ponds. However, a highly significant association was demonstrated between the incidence of illness and consumption with water. This association was particularly strong in relation to water consumption at home, during the first week of July.

### Conclusion

While there is no conclusive evidence from the investigation to demonstrate that the outbreak was associated with the mains water supply, such evidence that is available indicates that the water supply was the most likely source of infection. The incidence of infection, prolonged and variable incubation periods of illness in relation to the timing of the excavation work



and interruption of water supply - together with the absence of evidence to indicate a continuing problem - suggest a point source contamination of the supply. Evidence obtained from the case control study relating to water consumption during the period in question served to substantiate this theory.

A few cases of infection occurred before the main break. However, the number is significantly more than would normally be expected, and this fact has not been overlooked. It is considered that at least some of these cases may have actually been infected during the main outbreak, as their stools were only shown to be positive during the period of the outbreak, and that their earlier symptoms may have been related to some other cause. It is possible that one such case constituted the local source of infection leading to the outbreak but this has never been established.

The localized nature of this outbreak has ruled out any failure in the treatment process, because water from this particular treatment works is supplied to at least half the City's population, throughout the greater part of which, no cases were detected. Whilst conventional testing does not always detect contamination with *G. lamblia*, routine microbiological testing of the service reservoir and main indicated no post-treatment contamination of the reservoir. We are left, therefore, to conclude that contamination arose either by direct ingress of the organism into the main whilst open or

possibly by means of back syphonage caused by reduced mains pressure during the work.

It is fortuitous that the British Public Health Laboratory routinely examines all stools from cases of diarrhoea for Giardiasis, otherwise this outbreak might not have been identified and investigated so promptly. It would appear that not all laboratories do the same. The outbreak ended in late August and while no failure in water treatment has been demonstrated, it is significant that an outbreak has been identified which implicated a medium which has hitherto been regarded as a safe commodity.

From our experience we would suggest routine screening of all stools for Giardiasis in cases of diarrhoea of unknown cause and that the possible implication of water as a vector of this infection be borne in mind in any future outbreak investigations.

#### Acknowledgements

We would like to express appreciation for assistance in the investigation of this outbreak to Dr. I.A. Baker, former Medical Officer for Environmental Health for the City of Bristol; Dr. A.E. Jephcott, Director, Public Health Laboratory, Bristol; Bristol Waterworks Company; Wessex Water Authority; and particular thanks to Dr. N. Begg of the Communicable Diseases Surveillance Centre.

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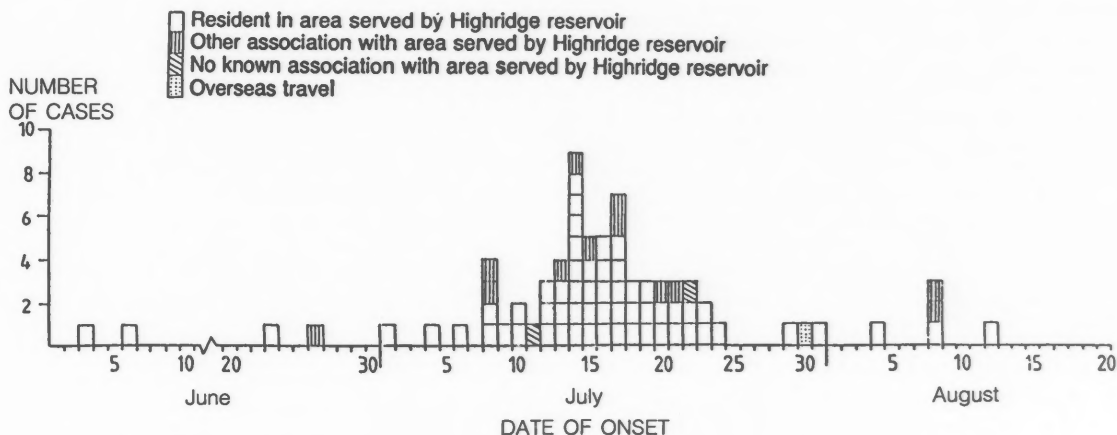


Figure 1: Dates of onset of confirmed cases of giardiasis Bristol, June-August 1985

## FDA: The Cop on the Consumer Beat

Frank E. Young, M.D., Ph.D.  
Commissioner of Food and Drugs

In a recent column, I discussed FDA's role as a public health educator, providing information and guidance to consumers, health professionals, and industry about the products the agency regulates.

For industry, FDA provides guidance on good manufacturing practices and other regulatory requirements. Most often, this guidance is accepted and followed. But on those occasions when - whether intentionally or not - a food, drug or medical device is on the market that does not belong there because it is unsafe or ineffective, FDA has a variety of legal options it can employ to protect consumers.

Usually, a company is given the opportunity to correct the problem voluntarily before FDA pursues legal action. Less severe problems can sometimes be remedied by reconditioning the product - for example, replacing improper labeling on food or drug containers. In fiscal year 1987, 4,240 voluntary corrections were undertaken by industry and verified by FDA.

FDA can encourage a company to correct an improper manufacturing process or voluntarily recall a violative product from the market. FDA prefers when possible to promote compliance other than by going to court, and product recalls are the most common means of doing so.

A recall is generally the fastest and most effective way to protect the public from an unsafe product. In fiscal year 1987, there were 2,398 recalls, done either on the initiative of the manufacturer or distributor, or at the urging of FDA.

Among the most significant - and wide-reaching - recalls in recent years have been those involving a variety of dairy products contaminated with the bacteria *Listeria monocytogenes*. Since FDA and the dairy industry uncovered the problem in 1985, more than 500 *Listeria*-contaminated products, from ice cream to cheese, have been recalled from the market. These recalls are noteworthy not only because they've become so widespread, but because of the potentially serious public health hazard involved: The disease caused by *Listeria* - listeriosis - can be very severe, even fatal, for certain high-risk groups, such as unborn babies, newborns, and people with impaired immune systems.

It was an outbreak of listeriosis caused by contaminated Mexican-style soft cheese in the Los Angeles area in 1985 that triggered a two-year FDA investigation into *Listeria*-contaminated foods. During that outbreak, 142 reported cases of listeriosis led to 47 fatalities, including 19

stillbirths and 10 infant deaths.

Overall, it's estimated that there are about 1,600 cases of listeriosis in the United States annually. FDA continues to monitor dairy products, seafood, and other foods for *Listeria* contamination.

When a company can't or won't correct a public health problem with one of its products voluntarily, FDA has two major legal sanctions it can bring to bear. The most commonly used is seizure of the offending products.

A seizure is a civil court action to confiscate a specific lot of goods and remove it from the market. FDA must request this action of a federal court judge, who orders U.S. marshals to carry out the confiscation. During fiscal year 1987, FDA was involved in 200 seizures.

Also, some \$9 million worth of illegal anabolic steroids were confiscated during the year. The steroid cases were the culmination of investigations begun in 1984 into a black market for these powerful, dangerous drugs, abused by athletes and body builders - even pre-teen boys and girls - to increase muscle development and strength. (For more about the dangers of steroid abuse, see "Athletes and Steroids: Playing a Deadly Game" in the November 1987 *FDA Consumer*.)

During fiscal year 1987, FDA initiated 14 injunctions. Among them was a case involving Padma 28 Tibetan Herbal Food Supplement. This imported drug consisted of 22 herbs and was promoted for numerous medical uses, such as treating atherosclerosis, improving blood circulation, lowering cholesterol, speeding the healing process, normalizing immunological responses, and improving memory, mental functions, alertness and feelings of well-being. The importer, George Weissmann, Inc.; a distributor, Central Health Network; and other defendants were enjoined last fall from importing, processing, packing, labeling, promoting or distributing Padma 28 tablets unless and until FDA approves the drug or accepts revised labeling that makes no medical claims.

Another legal option provided to FDA is criminal prosecution of the person or company responsible for a violation of the law. A prosecution is recommended not to bring about future corrections directly, but to punish those who violate the law, thereby generally encouraging people to avoid violations. Convictions can result in fines against the firm or fines and imprisonment for individuals.

One case concluded last year involved pesticide-

contaminated animal feed that had caused a quarantine of dairy herds on nearly 100 farms and a recall of milk and other dairy products in eight states. Three officials of the feed company that caused the contamination were each sentenced to jail terms, one for three years and two for one year. Fines of \$7,500 were also imposed on two of those officials, and a fourth man was fined \$5,000. (For more about this case, see "From Tainted Feed to Mothers' Milk" in the March 1987 *FDA Consumer*.)

Recent years have also seen a number of cases involving counterfeit drugs - unauthorized copies of legitimate drugs that bear, without authorization, the trade name or other marks of the authentic product. Some have the same active ingredients; others don't. All such counterfeits are illegal.

One of the most publicized cases involved a plot to import counterfeit Ovulen-21 birth control pills from Spain and Guatemala. After a two-year investigation by FDA, two Floridians were tried, convicted and sentenced last September to 24 years in prison for their roles in the conspiracy. Another defendant pleaded guilty and was sentenced to five years in prison, two others received 10-month sentences, a sixth defendant received three years' probation and a \$7,500 fine, and a seventh is awaiting trial. The counterfeit Ovulen-21 was removed from the market by recalls and seizures.

Some of our investigations into black-market steroids, which are headed by the Department of Justice, have led to criminal cases. Over the past three years, 124 people have been charged with federal crimes related to illegal steroid sales. As this column went to press, more than 80 had been convicted or had pleaded guilty, and 20 had entered formal plea agreements. Jail sentences of up to six years have been handed down, along with fines of up to \$400,000.

One of the most insidious crimes FDA must fight is product tampering. Tampering presents such a frightening and unpredictable threat to the public health that in 1983 Congress enacted the Federal Anti-Tampering Act to provide stiff penalties for these drugstore terrorists.

Last year, Edward Arlen Marks became the first person convicted under the new law. He was found guilty of lacing drug capsules with rat poison in an unsuccessful effort to manipulate stock prices and was sentenced to 27 years in prison.

Not only domestic products but imports, too, are subject to the laws FDA enforces. FDA field forces inspect imports while the goods are still in the custody of the U.S. Customs Service. Violative products are detained.

Indeed, goods from foreign countries are a growing concern: Imports of FDA-regulated goods have increased threefold since the mid-1970s - from 500,000 to 1.5 million shipments, of which the agency is able to cover less than 10 percent.

More than 21,000 shipments of imports - from European cheeses to preserved fruit from the Far East - were detained last year because the goods appeared to be unacceptable under FDA regulations.

In the areas of both imports and domestic products, FDA is committed to streamlining its procedures and

clarifying its policies to provide more reasoned and uniform enforcement actions. The agency has made such improvements top priorities in its Action Plan, the "navigation chart" for guiding FDA into the 21st century.

One example of how quickly FDA can bring legal action occurred last August in Illinois. When investigators in FDA's Chicago district office visited a food warehouse in nearby Batavia, they discovered gross contamination and filth, including rodent infestation. Because a great deal of food was involved and the contamination was so flagrant, it was obvious that fast action was needed to make sure none of the merchandise ever reached the market. Working with FDA headquarters, the U.S. Attorney's Office, and the U.S. Marshals Service, the district office got approval for a seizure in one day and had the U.S. Marshals carry it out the next, protecting Chicago-area residents from \$1.5 million worth of unfit food.

FDA has since instituted a "fast track" for handling mass seizures of grossly contaminated food, enabling the agency to move quickly in other cases similar to the one in Illinois.

The prompt processing of enforcement actions is clearly in the interest of consumers, legitimate businesses regulated by FDA, and the courts. Prompt enforcement actions ensure businesses of a fair competitive environment because they may rely on clear regulatory standards.

FDA is not reluctant to use the tools that the law provides when that is the best way to solve a public health problem. When a situation can be solved by education, we will serve as the instructor. When a sterner approach is called for, we will be the "cop." But in all instances we will strive to be absolutely fair, to make judgments on sound scientific principles, and to focus first and foremost on issues that threaten public health.

*(Reprinted FDA Consumer/April 1988).*

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# News

## ***Wolf Named Symbol Council Administrative Officer***

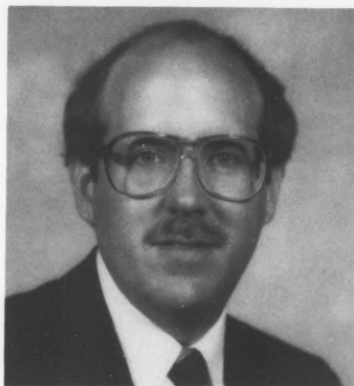
Robert F. Wolf has been named Administrative Officer of the 3-A Sanitary Standards Administrative Council, Waukesha, Wisconsin. Mr. Wolf was employed with the Waukesha Pump Division of the Waukesha Foundry Company for 16 years, where he served as Manager of Product Development and Systems, having extensive contact with dairy and other food processing industries. Since 1986, he has been on the teaching staff of Waukesha Technical College as an electronics instructor. Mr. Wolf is a registered professional engineer in the State of Wisconsin.

The 3-A Sanitary Standards Symbol Administrative Council was organized in 1956 for the purpose of granting authorizations to use the 3-A Symbol on dairy processing equipment that meets 3-A Sanitary Standards for design and fabrication. It is comprised of an 8-member Board of Trustees representing the Dairy Industry Committee, Dairy & Food Industries Supply Association and the International Association of Milk, Food & Environmental Sanitarians. Current Trustees are: Dr. Warren S. Clark, Jr., Chairman; Mr. Carl F. Nielsen, Vice-Chairman; Mr. Earl O. Wright, Secretary-Treasurer; Mr. William L. Arledge, Dr. Henry V. Atherton, Dr. A. Richard Brazis, Mr. David D. Fry and Mr. Robert L. Nissen.

For further information about the 3-A Symbol Council, write to: 3-A Sanitary Standards Symbol Council, Suite #100, W255 N477 Grandview Boulevard, Waukesha, WI 53188 or call 414/542-0200.

## ***E.T. Ryser Receives Hoyt Research Award***

Elliot T. Ryser, a doctoral candidate in the Department of Food Science, University of Wisconsin-Madison, received the Richard M. Hoyt Award at the annual meeting of the American Dairy Science Association held on June 26-29, 1988 in Edmonton, Alberta, Canada. The Hoyt Award recognizes excellence in research by a graduate student whose work provides information with direct application to problems within the dairy industry. Ryser received the award for his research into the viability and growth of *Listeria monocytogenes* in fermented dairy products. The information obtained from these studies will aid in ensuring the safety of processed dairy foods and in maintaining positive consumer attitudes toward dairy



*Elliot T. Ryser*

products. This organism is found in up to 12% of raw milk samples and is the causative agent of listeriosis in humans, a disease which can result in spontaneous abortion, perinatal septicemia and meningitis.

Mr. Ryser's research has demonstrated that the organism does not grow during the manufacture of Cheddar or cottage cheese, but that it can grow in Camembert and brick cheese after the rise in pH which is a normal part of the ripening process of these latter cheeses. Furthermore, Mr. Ryser demonstrated that survival of this pathogen in cold pack cheese food can be shortened by addition of sorbate and acidification. He has also shown that the pathogen appeared in whey when contaminated milk was used to make cheese. During his investigations Mr. Ryser also made significant improvements in procedures used to monitor *Listeria* in cheese products. Ryser's initiation of research into the *Listeria* problem preceded widespread interest in this organism as a public health problem.

In 1986 and 1987, Ryser presented results of his research at the annual meetings of IAMFES. Each year he received the second place award in the Developing Scientist paper presentation competition.

Elliot Ryser was born (1957) and raised in Milwaukee, Wisconsin. He received the B.S. degree in Biology from Carroll College and a second B.S. in Bacteriology from the University of Wisconsin-Madison. Mr. Ryser then entered the Food Science-Food Microbiology graduate program at the University of Wisconsin-Madison. Under the direction of Dr. Elmer H. Marth, Ryser received the M.S. degree in 1982 and has been a research assistant enrolled in the Ph.D. program since January 1984. He will complete work for the Ph.D. during 1988. In addition to his academic training, Mr. Ryser has worked for the Milwaukee Health Department and as a dairy plant aide at the University of Wisconsin.

## Du Pont Issues Call for 1988 Packaging Awards

The Du Pont Company has issued a call for entries in the 1988 Du Pont Awards honoring innovation in food processing and packaging technology. The international competition, now in its third year, recognizes innovative ideas from the food industry that broaden the applications of plastics for food packaging.

"The Du Pont Awards have been especially successful in spotlighting the full range of companies that are involved in food product and packaging innovation," said Bruce A. Bachman, director of Du Pont's Packaging Products Division. "Last year's Diamond Award went to five companies that contributed to the introduction of 'Perdue Done It!' precooked chicken awards. In 1986, three companies were recognized with our top award for Campbell's 'Cookbook Classics' microwavable soups. Thirty-four companies have been honored in the past two years through this program," he added.

The awards competition, conducted in cooperation with the National Food Processors Association (NFPA), is open to entries from North America and Europe. To be eligible, entries must involve packaging with plastic materials and have been marketed or commercialized between June 30, 1987 and November 14, 1988.

Although plastic materials must be an essential part of the final product package, the entries may come from any part of the food industry.

"The Du Pont Awards program has attracted more than 145 entries in the past two years," Bachman noted. "The winners have been at the forefront of packaging trends, with innovations in microwavable and dual-ovenable packaging, aseptic packaging, controlled atmosphere packaging, tamper-evident designs, easy-open and reseal devices, and single-service -- along with the advanced materials, equipment and marketing concepts to make these breakthroughs a reality."

Packaging and processing industry executives, suppliers, educators and the trade press will make up the Du Pont Awards judging panel. Criteria for evaluating entries include improvements in product flavor, taste, aroma and appearance; advances in product safety, nutrition, availability and ease in use; reduction in cost to produce, purchase and use; extended shelf life; reduced spoilage or waste; and improvements in product retailing.

The Du Pont Award winners will be announced January 31, 1989, at the NFPA convention in Anaheim, California. The deadline for entries is November 14.

Entry information can be obtained by writing: The Du Pont Awards Competition, Du Pont Company, N2424, Wilmington, DE 19898, or calling 302/999-2525.



Dr. Elmer H. Marth

### E.H. Marth Receives Teaching Award

Dr. Elmer H. Marth received the Kraft, Inc. Teaching Award at the 1988 Annual Meeting of the American Dairy Science Association held in Edmonton, Alberta, Canada on June 26-29, 1988. Marth, a professor at the University of Wisconsin, was born on September 11, 1927 in Jackson, Wisconsin.

Dr. Marth completed all his higher education at the University of Wisconsin, Madison. He received his undergraduate degree in Bacteriology in 1950, followed by his M.S. and Ph.D. degrees in Bacteriology in 1952 and 1954, respectively. Throughout his career, Dr. Marth specialized in Dairy Food Microbiology. He assisted in teaching and conducted research in dairy microbiology at the University of Wisconsin from 1949-1955. From 1955-1957, Dr. Marth worked at the University of Wisconsin, Madison as an instructor in the Bacteriology Department. In 1957, Dr. Marth joined Kraft, Inc. in the Research and Development Division as a bacteriologist. He progressed through ranks of Research Bacteriologist, Senior Bacteriologist, Group Leader and was appointed Associate Manager, Microbiology Laboratory in 1966. Later in that year, Dr. Marth joined the University of Wisconsin, Madison in the Department of Food Science as an Associate Professor. He was promoted to Professor in 1971, a rank he still holds along with joint appointments in the Department of Bacteriology and in the Department of Food Microbiology and Toxicology, also known as the Food Research Institute.

Throughout his 34-year career, Dr. Marth has been a prolific writer, lecturer and communicator, helping his students, the food industry and government bodies alike. He has truly acquired an impeccable reputation as an accomplished professional. He has authored, co-authored and edited numerous research articles, two laboratory manuals, six books, sections of or chapters in 30 books, 31 review articles and 15 articles in trade publications. His publications number nearly 500. In

general, these diverse publications have been useful in teaching and as reference material for dairy food microbiology topics at various levels, ranging from university undergraduate classes and short courses to professional practice.

In addition, Dr. Marth has developed a set of slides and handouts dealing with both elementary and advanced aspects of foodborne illness, food sanitation and listeriosis. Dr. Marth is on the editorial board of several reputable journals. He served as Editor of the *Journal of Food Protection* for over 20 years.

Dr. Marth has received several prestigious awards for professional excellence. The American Dairy Science Association awarded him the Pfizer Award (1975), the Dairy Research Foundation Award (1980), and the Borden Award (1986). The International Association of Milk, Food and Environmental Sanitarians gave him the Educator Award (1977), Citation Award (1983), and Honorary Life Member Award (1987). The Institute of Food Technologists elected him a Fellow (1983) and awarded him the Nicholas Apert Award (1987). The American Public Health Association cited him for meritorious service in 1977 and 1983 as did the National Confectioners Association in 1987. The American Cultured Dairy Products Institute awarded him the Nordica Award (1979). The Wisconsin Association of Milk and Food Sanitarians conferred on him the Sanitarian of the Year Award in 1983.

Dr. Marth's teaching activities include courses in Food Sanitation, Food Fermentations, Written Scientific Reports, and some lectures in Farm Bacteriology, Foodborne Disease Hazards, Advanced Microbiology of Foodborne Diseases, Science of Food, Food Microbiology, Environmental Toxicology, Regulatory Veterinary Medicine and Public Health, and Meat Science and Technology. He has been involved in teaching short courses on Cheesemaking, Milk Pasteurization and Process Control, Food Microbiology, Confectionary Technology and Introduction to Safe Food Processing. Dr. Marth has served well on various teaching and curriculum committees of his University. Besides teaching, Dr. Marth is engaged in original research with his graduate students which gives him an opportunity to stay abreast of the latest developments for integration into his teaching expertise.

Dr. Marth's excellent coaching and training ability is evidenced by the fact that four of his graduate students have received the Hoyt Memorial Award for Excellence in Research presented by the American Dairy Science Association. Testimonials from his former students attest to Dr. Marth's effective teaching ability to transform complex microbiology subject matter to levels that his audience can relate to. Dr. Marth's motivating technique of communication is effective and challenging. Dr. Marth helps students develop skills for self confidence and stimulates them to strive for excellence. He has been termed "ideal teacher" by one of his students.

## *Special Ceremony Marks Opening of Minnesota-South Dakota Dairy Foods Research Center*

A special ceremony marked the official opening of the Minnesota-South Dakota Dairy Foods Research Center recently. The new center is one of six opening nationwide to develop new dairy products and new ways of using dairy products.

Funding for its \$1.2 million annual budget will come from several sources. During each of the next five years, the National Dairy Promotion and Research Board will contribute \$400,000; the Minnesota Dairy Promotion Council, \$200,000; American Dairy Association of South Dakota, \$67,373; and the University of Minnesota and South Dakota State University, \$421,180 as matching funds. Minnesota dairy processors and food companies have pledged additional funding support.

Directed by Dr. Joe Warthesen in Minnesota, and Dr. John Parsons in South Dakota, the center will focus research efforts on the application of genetics and biotechnology to the processing, quality and safety of dairy foods. Specific projects will include the development of new starter cultures to accelerate cheese ripening and develop new cheese flavors, develop new uses for milk components, and reduce cholesterol and lactose in dairy products.

Minnesota is one of the country's leading dairy states, ranking second in total manufactured dairy products, second in cheese production, third in butter production, and fourth in total milk production. Minnesota and South Dakota together have more than a million dairy cattle and produce nine percent of the nation's milk supply.

The other five centers to be funded nationally are: Cornell/University of Vermont; University of Wisconsin; Utah State University/Oregon State University/Brigham Young University; University of California, Davis/California Polytechnic State University; and North Carolina State University/Mississippi State University.

The Minnesota Dairy Promotion Council, funded by Minnesota's 18,000 dairy farmers as part of a 15 cents/hundredweight national checkoff, conducts an extensive advertising program and funds the promotion programs of the American Dairy Association of Minnesota and the educational programs of the Dairy, Food and Nutrition Council of Minnesota.

For more information regarding the new center, contact: Dr. Joseph Warthesen (U of M) 612/624-3224; Mr. C. Anthon Ernstrom (National Dairy Board) 703/538-4800; or Mr. Mike Kruger (Minnesota Dairy Promotion Council) 612/488-0261.

## ***IAMFES Secretary Nominations Due for 1989 Elections***

Nominations are now being taken for Secretary for IAMFES. This year an academia representative will be elected.

Once all nominations are received by the nominating committee, two persons will be chosen to run for the office. This is a five year term, moving up yearly until he or she is President of IAMFES, then serving one year after as Past President. The term of office begins the last day of the 1989 Annual Meeting, this year held at the Hyatt Regency Crown Center, Kansas City, MO, August 13-17, all IAMFES Executive Board Members meet three times a year.

Two people selected are placed on the ballot. The winner is determined by majority vote of the membership through a mail vote, in the spring of 1989.

Please send a biographical sketch and photograph NO LATER THAN OCTOBER 18, 1988 to the Nominations Chairperson:

**Dr. Elmer H. Marth**  
**Chairman, IAMFES Nominating Committee**  
**Dept. of Food Science, University of Wisconsin**  
**1605 Linden Dr.**  
**Madison, WI 53706**  
**608-263-2004**

### ***Phillip Nelson Receives 1988 Minnesota Section Macy Award***

Dr. Phillip E. Nelson, Department Head of Food Science at Purdue University, is the recipient of the 1988 Harold Macy Food Science and Technology Award. This award is given by the Minnesota IFT Section in recognition of an outstanding example of food technology transfer or cooperation between scientists in areas of service represented by universities, government or private industry.

Dr. Nelson was nominated for this award as a result of his scientific endeavors and technical leadership in the development and commercialization of aseptic bulk storage and transportation systems for intermediate processed foods. His contributions span 18 years and continue to attract industrial attention, both nationally and internationally. As a result of his research in the application of this technology, food processors have been able to address the major economic losses encountered in the fruit industry because of the perishable nature of these products. Food processors for such items as tomatoes, grapes and apples now prepare an intermediate product which can be stored in bulk at



*Dr. Phillip E. Nelson*

ambient temperatures and used in final products according to consumer demand.

In addition to his research efforts, Dr. Nelson is known as an outstanding educator and administrator at Purdue University. He has co-authored a manual on aseptic processing and packaging and annually directs a workshop on the same subject. He was the driving force behind the state's funding of the research facility at Purdue which is used by many companies to further develop the aseptic technology he initiated.

Dr. Nelson is active in many professional organizations and has served on committees for a number of national and international organizations. In 1980, he was elected a Fellow of IFT, and he currently serves on the national Executive Committee.

The Minnesota IFT Section salutes Dr. Nelson for his transfer of knowledge which has impacted so significantly on the food industry.

### ***MIF and IICA Announce Creation of Frozen Novelty Caucus***

The International Ice Cream Association (IICA) has announced the creation of a new caucus: the Frozen Novelty Caucus.

The new caucus, established by the IICA Board of Directors at their annual spring meeting, will unite IICA members that manufacture and/or market frozen novelties, giving them the opportunity to discuss issues, and to implement programs and activities that are particularly relevant to their product lines.

"The Frozen Novelty Caucus will allow IICA to better serve its membership and the industry by uniting manufacturers of specific products," said Tom Lutsey, president of Gold Bond Ice Cream. "It will provide a forum in which members can discuss issues unique to novelty frozen desserts." Lutsey and Max Ballard, general manager of Good Humor Corporation, are co-chairs of the caucus.

The organizing committee for the newly created Frozen Novelty Caucus held its first meeting on June 23. This ad hoc committee of 10-12 novelty manufacturers and marketers met in June to discuss caucus objectives, participation criteria, and potential programs and services that will benefit affiliated companies.

At this meeting, priority issues for the Frozen Novelty Caucus, including product safety, marketing, labeling standards, consumer complaints, and weights and measures, were discussed.

IICA is the trade association for manufacturers and distributors of ice cream and other frozen dessert products. The Association's activities range from legislative and regulatory advocacy to market research, education, and training. Its 210 member companies produce as estimated 85 percent of the ice cream and ice cream-related products consumed in the United States and Canada. For more information, contact: Andrea Sussman, International Ice Cream Association, 888 Sixteenth St. NW, Washington, DC 20006 202/296-4250.

### ***Sulfites Still in Some Foods***

If you're allergic to sulfites, becoming a good label-reader may keep you from experiencing wheezing attacks and other reactions.

"The Food and Drug Administration now has in place several regulations designed to protect people with sulfite sensitivities," says Dr. Alice Hunt, a nutrition specialist.

Labeling regulations that took effect last year required that foods containing 10 parts per million or more of sulfites include that information on the label, she explains.

The specialist notes that wines, canned and frozen shellfish, canned and frozen fruit juices, dried fruits and pickled foods and condiments are just a few of the products still treated with sulfites. Baked goods including pizza crust and cookies may also contain the preservatives.

Although severe allergic reactions to foods containing smaller amounts of sulfites are rare, those with allergies should learn to recognize the names of sulfiting agents that appear on packages, Hunt advises.

According to the Texas A&M University Agricultural Extension Service specialist, these include sodium sulfite, sulfur dioxide, potassium or sodium bisulfite, sulfur dioxide and potassium or sodium metabisulfite.

"Although the FDA banned the use of sulfiting agents on fresh fruits and vegetables in 1986, you shouldn't assume that all foods at salad bars are sulfite-free," cautions Hunt.

She explains that because the ban only prohibits the use of sulfites on raw fruits and vegetables, other foods which are legally sulfite-treated may be mixed in among salad bar offerings. The most common of these are shrimp and pickled foods, such as peppers, olives or okra.

Hunt says that an estimated one million Americans are allergic to sulfites, but for the rest of the population they present no hazard.

Sulfites are used to delay or prevent changes of color, flavor or texture of foods and beverages which makes them more appetizing for consumers, she adds.

### ***New Report Examines Commercial and Homemade Baby Foods***

Either commercial or homemade baby foods can be a safe, wholesome part of a nutritious diet for infants, according to the new report *Baby Foods*, published by the American Council on Science and Health (ACSH), an independent scientific organization.

"Advocates of homemade baby foods have claimed that additives or other ingredients in commercial baby foods are causes for concern. But the truth is that homemade foods may contain more salt, sugar, water, or additives than their commercial equivalents," said ACSH Executive Director Dr. Elizabeth M. Whelan. "If homemade baby foods are poorly chosen, carelessly prepared, or improperly stored, they may also be unsanitary or lacking in nutrients."

"We're not trying to discourage people from making homemade baby food. Parents who select and prepare foods carefully can certainly provide their infants with safe, nutritious meals," she continued. "On the other hand, parents who elect to use commercial products need not feel that they have sacrificed quality for the sake of convenience."

The technology currently used by baby food manufacturers maximizes nutrient retention and safety, and many desirable features of commercial baby food preparation simply cannot be duplicated at home, the ACSH said.

All parents should consult a pediatrician or registered dietitian to help them plan balanced diets for their infants at each stage of development, the ACSH report recommends.

"Parents should always follow the specific dietary instructions provided by their child's doctor, rather than relying on the suggestions of relatives or friends," said ACSH Associate Director Dr. Edward G. Remmers.

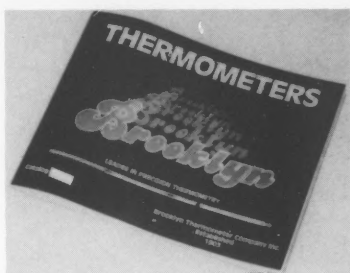
"Professional recommendations concerning infant feeding have changed dramatically over the years; the advice you receive from laymen is likely to be outdated."

"Parents who follow current dietary recommendations can be assured that their infants are receiving an adequate diet. The current recommendations are also designed to minimize problems associated with food sensitivity, tooth decay, and obesity," he said.

Infants should receive most of their nutrition from breast milk or infant formula, not from baby foods, the ACSH report states. After four to six months, solid foods should be added to supplement, but not replace, breast milk or formula, the report advises. To help avoid sensitivity problems, each new food should be introduced in small portions and increased slowly over several days, according to current recommendations. ACSH noted that babies should be fed to satisfy their appetites, and not urged to finish the portion or jar; this precaution may help to reduce the risk of obesity.



# Industry Products



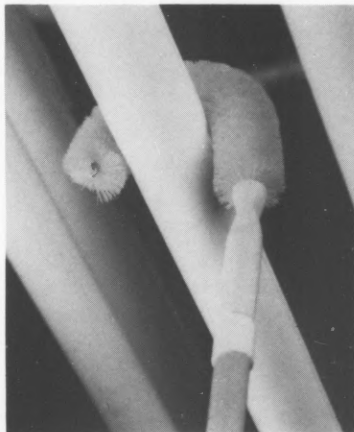
## Free Thermometer Catalog

This comprehensive 44-page color catalog #90 describes Brooklyn's unique line of calorimeter thermometers which have 100 scale subdivisions between each degree! Catalog 90 also features a complete line of Laboratory and Precision Grade Thermometers, in addition to the complete line of ASTM Thermometers. Electronic and LCD Thermometers meet strict specifications on accuracy and convenience of features. Other thermometers shown include bi-metallic dials; recording thermometers, Max-Min, outdoor, and dual sensor indoor/outdoor styles.

Other instruments featured in the Catalog 90 include hydrometers for general use, proof, ASTM, and Brix Thermo-Hydrometers. Also shown are Brooklyn's Precision Hygrometers and Psychrometers for testing current ambient relative humidity.

Catalog 90 is available FREE on request.

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## Tri-Clover Offers Updated Catalog: "Tri-Flo Centrifugal Pump"

Tri-Clover, Inc. offers an updated "Tri-Flo Centrifugal Pump" catalog, describing its full line of 3A approved stainless steel sanitary centrifugal pumps for corrosion and contaminant resistant service.

The catalog is a complete reference to the C-Series Close Coupled pump and the SP-Series Base Mounted pump including mechanical specifications, seal selection tables, and viscosities tables. Additions to the catalog include mechanical specifications and dimensional data on the Model C4410 Close Coupled Pump and information on the Type DG Clamped-in Seat/Assembly and the Series EH Pedestal Mount Cast Design Centrifugal Pumps. There is a new chart on friction loss in sanitary 1/2" and 3/4" OD tubing and fittings, as well as revised pump and motor selection charts.

Headquartered in Kenosha, Wisconsin, Tri-Clover, Inc. is a leading manufacturer of sanitary stainless steel valves, pumps and fittings, as well as flow control, batch/weight and Clean-In-Place (CIP) systems. Founded in 1919, Tri-Clover, Inc. is now a member of the Alfa-Laval Group, a \$1.5 billion multi-national organization headquartered in Sweden that operates more than 160 companies in 130 countries around the world.

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## New Sparta CIP Brush Cleans Pipe Exteriors

Sparta Brush Company has introduced a new brush designed to clean the top surface of piping.

The CIP Brush is hook shaped to fit over the top of 1-1/2" to 4" pipes making the cleaning of these hard-to-reach surfaces much easier. The brush features durable, synthetic bristles anchored in wire which is imbedded in a plastic block designed to accept any threaded handle. As part of the Sparta Tri-Zone Color Coding System for fighting bacteria by segregating brushes in usage areas, the bristles are colored yellow for use in clean-up of non-food-contact surfaces.

Sparta Brush Company manufactures and markets a quality line of specialized brushes for the dairy, food processing and food service industries.

**Please circle No. 281  
on your Reader Service Card**



## Tecator Introduces a Fast, Portable and Programmable Instrument for Demanding Commodity Testing - The GP Moisture Analyzer

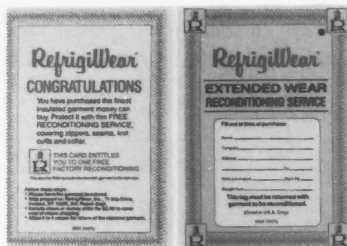
The Tecator GP Analyzer is a new instrument for rapid and precise moisture testing of pourable solids such as pharmaceutical tablets and powders, grains, etc. Robust and portable, the Tecator GP Analyzer is ideally suited for the demanding needs of quality assurance and production management in the pharmaceutical and chemical industries.

The GP Analyzer is based on simultaneous measurement of weight, capacitance and temperature of the sample to give a corrected moisture reading - thus eliminating the need for weighing or thermostating samples prior to testing. It works on moisture contents from near 0-35%. The accuracy is within 0.2% for moisture levels up to 20%.

The GP Analyzer contains unique curve fitting software which makes it possible for the user to easily optimize the accuracy of moisture readings. Up to 16 commodity programs can be stored in the Analyzer, and it takes just a few minutes for the user to enter a calibration. Basic functions can be calibrated by the user. The moisture content is displayed within seconds.

The GP Analyzer provides readout facilities for moisture content (%), weight, and temperature, and can be connected to a printer and the Tecator Labtec System for data handling and storage.

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Free "Extended Wear Reconditioning Service" covers repairs on zippers, seams, knit cuffs and colors for all RefrigiWear insulated outerwear.

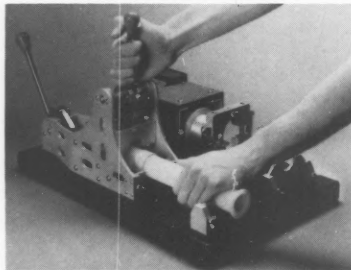
### RefrigiWear Offers Free Factory Reconditioning

A free "Extended Wear Reconditioning Service" is now being offered on all RefrigiWear insulated garments. This unique offer covers repairs on zippers, seams, knit cuffs and collars for all RefrigiWear insulated outerwear.

Reconditioning helps RefrigiWear's rugged, long lasting garments maintain the serviceability and almost-new look throughout the life of the garment.

To take advantage of this offer, the wearer simply completes the information portion of the reconditioning service hangtag, ships the freshly laundered garment with the tag to the factory and includes a three dollar check to cover return shipping.

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on your Reader Service Card**



### Cantilever Valves Easy-Access/Sanitary

Requiring no tools, these sanitary valves can be assembled and disassembled with ease. Loosening of the stay in place handgrips, allows the hinged door to open providing easy access to the rotor. This cantilevered design allows complete removal and cleaning of all internal parts. Teflon seal rings remain on rotor hub when rotor is removed. Standard drop-thru or side entry housing are available in both round or square inlet designs. Sanitary design available.

**Please circle No. 284  
on your Reader Service Card**

### Collagen Discs for Culture Plate Wells

ICN Biochemicals announces the introduction of a new permeable collagen film for tissue culture use. These Collagen™ membranes are available in disc form, ready for use in most standard culture plate wells. Collagen™ discs are available in two convenient sizes -- 14 mm diameter for use in 24-well culture plates, and 31 mm diameter for use in 6-well culture plates.

The collagen films are transparent so cells in culture can be easily observed with a microscope. Additionally, these permeable membranes permit characteristic permeation for absorption of nutrients and exhaustion of metabolites. Cell-cell interactions can be studied without direct contact between cells, since two different types of cells may be cultured simultaneously -- one on each side of the membrane.

The Collagen™ membranes are made of highly purified, pyrogen-free, pepsin-solubilized collagen, and are especially effective on epithelial cell culture. The Collagen™ discs are conveniently packaged in sets of 24 and 48 pieces, ready for immediate use. Complete protocols are available.

**Please circle No. 241  
on your Reader Service Card**

### Sani-Tech Introduces a New Do-It-Yourself Sanitary Processing Tubing System for Pilot Plants

Sani-Tech introduced an all-new concept in modular construction of sanitary piping systems for plant or processing system at Interphex, July 19-21.

The Sani-Tech flange former provides the key to a bacteria-free non-metallic sanitary processing system on demand. The user simply inserts a length of Sani-Tech tubing, PP, PVDF or PVC and easily forms ferrules which match up to sanitary stainless steel fittings, tubing connections and assemblies.

The non-toxic, non-contaminating non-metallic construction meets FDA, 3A and Pharmacopoeia XXI Class VI standards.

The smooth bore tubing construction maintains the highest quality, bacteria-free operation. Sani-Tech products are easy to clean via CIP and COP methods.

The flange former accommodates 3/4" to 2" rigid and polypropylene, Kynar PVDF and clear PVC in a variety of lengths and configurations. Complete systems or tees, elbows, valves, supports and other components are available.

**Please circle No. 242  
on your Reader Service Card**



Lightweight Matabi K-16 sprayer has many new practical features, adds safety to farm, garden and commercial spraying.

### Lighter, Safer Knapsack Sprayers From Matabi

The Spanish Matabi Co. is introducing an all-new knapsack garden sprayer with a number of innovative features.

Thanks to an injection-molded 16-litre (4.2-U.S. gal.) tank the entire "K-16" sprayer weighs barely 3.4 kg, or less than 7 1/2 lbs. And the tank may be inverted in seconds for right- or left-hand pumping. Ten easy pump strokes per minute maintain operating pressure, even fewer for weed spraying.

Safety is stressed throughout. The unit rests on a broad base and is styled for comfort. All openings are located on top of the tank. A protective rim makes spilled chemicals drain in to the well-screened filler port. The whole top surface is like one big super funnel. A large secondary filter inside the shut-off handle is quickly accessed and easy to clean.

Mechanical agitator, lightweight spray lance with adjustable cone nozzle, stainless ball valve and (at last) a handy carrying grip are standard issue. An optional solid-brass spray wand and a range of practical accessories are offered for the pro trade. As on every Matabi, all-plastic design prevents corrosion, warping, swelling, shrinking or dissolving of parts. The K-16 sprays all types of agrichemicals in water or oil solution. And like other Matabis it's made for rapid no-blueprints, no-tools service in the field. Replacement hoses, valves, wands, nozzles etc. are offered in attractive skinpacks.

The K-16 sprayer is suitable for domestic and farm/commercial pest and vegetation control, sanitation and other common uses in agriculture and horticulture.

Sold in more than 60 countries around the globe, Matabi made its first appearance in North American stores and garden centers during 1987. Deppe Ag-Tec of Burlington, Ont., Canada, serves as Matabi's clearinghouse for North America and the Caribbean.

**Please circle No. 243  
on your Reader Service Card**



Foodservice operators can get all the performance of cloth towels and greater economy with new SCOTTCLOTH™ Foodservice Towels in the stain-masking blue color from Scott Paper Company.

### New Scottcloth™ Foodservice Towel Provides Performance, Economy in Stain-Masking Blue Color

Foodservice operators can get all the performance of cloth towels and greater economy with new SCOTTCLOTH™ Foodservice Towels in the stain-masking blue color from Scott Paper Company.

SCOTTCLOTH Foodservice Towels are strong and durable cloth-replacement towels that are ideal for virtually any cleaning and wiping task in foodservice operations cleaning and wiping applications as rental cloth towels. They can significantly reduce operating expenses because they eliminate costly rental and laundry charges incurred with rental cloth towels.

Robert J. Behan, senior marketing manager at Scott's Wiper Business Unit, says foodservice operators can realize a significant cost savings by using SCOTTCLOTH Foodservice Towels instead of rental towels. "Rental charges for cloth towels are usually between 15 and 17 cents per towel, and replacement charges for lost or damaged towels can be as high as 25 or 30 cents each," says Behan. SCOTTCLOTH Foodservice towels cost about 14 cents each, and there are no replacement charges. In addition, rental cloth towels sometimes appear dirty and stained when they are delivered, while SCOTTCLOTH Foodservice Towels are always clean, fresh, and sanitary, explains Behan.

For more information, circle the number below on the reader service card.

Please circle No. 244  
on your Reader Service Card

### AMBIS Microbiology System Identifies and Classifies Microorganisms by Comparing Protein Banding Patterns

AMBIS Systems has introduced a rapid computerized system for microbial "fingerprinting" of all unicellular organisms, including bacteria, viruses, yeasts and protozoa. The AMBIS Microbiology System™ can deliver results in 8 hours after colony isolation of most microbes (in less than a day for yeasts), with no need for pretesting or secondary biochemical testing.

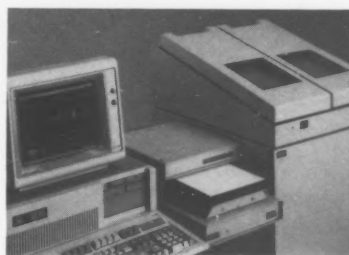
Both industrial and medical laboratories benefit from the AMBIS System's ability to quickly identify microbes at the genus, species and subspecies levels, including organisms which are difficult to identify by conventional methods. Applications are already taking shape throughout the world, from the Orange County Water District in California and the US Department of Agriculture...to St. Bartholomew's Hospital in London, the Central Public Health Laboratory in Colindale, England, and the Tumour Institute in Milan, Italy.

Industrial uses include epidemiological analysis of contaminants, identification of yeasts, investigation into spoilage problems, QC of patented or process microorganisms and monitoring of genetic mutations. Clinically, AMBIS provides a unique tool for the epidemiological investigations of outbreaks of infections or food poisoning caused by new or known strains of microorganisms. The "fingerprints" of newly identified strains can be immediately added to the AMBIS data base, thereby providing a fast and highly specific method of testing suspected cases.

The AMBIS process is always the same, no matter what type of organism is being examined. The microorganism's proteins are labeled with <sup>35</sup>S-methionine and then separated by gel electrophoresis. The resulting banding patterns are detected directly from the gel by a 2D radioisotope detector, which generates high-resolution images of the "fingerprints" on a graphics monitor. Computer control of both electrophoresis and detection ensures reproducibility. AMBIS pattern-matching software automatically compensates for experimental differences, making possible interlab comparison of fingerprints.

The microbial data base is customized based on the type of application. The user can compile a library of proprietary or unusual organisms...or a standard data base of common microbes. AMBIS application development services are available to solve specific problems, for example, to develop procedures and a data base for especially troublesome contaminants.

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on your Reader Service Card



AMBIS Microbiology System identifies and classifies microorganisms by comparing protein banding patterns.

### Non-stick/FDA-Compliant Coating Improves Operation, Lengthens Wear Life of Food/Drug Processing and Packaging Equipment

New product literature featuring detailed engineering properties of LECTROFLUOR® 615, a high-tech metal coating that exhibits superior chemical and abrasion/wear resistance while adding exceptional mold release properties, even at temperatures from -400°F to 550°F, has been announced by General Magnaplate Corp., Linden, NJ.

The LECTROFLUOR 615 coating performs with FDA regulations for direct food contact, making it particularly advantageous on both processing and packaging equipment used in the food and drug industries. The new leaflet lists the coating's physical, thermal, wear/frictional, mechanical, and di-electric properties. Also provided is a "Resistance Guideline" of polymer properties acceptable up to the temperatures shown for 42 chemicals.

Copies of the new technical literature on LECTROFLUOR 615 are available by circling the number below on the reader service card.

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on your Reader Service Card

LECTROFLUOR

**LECTROFLUOR 615**  
Meets FDA regulations for direct food contact. Exhibits superior chemical and wear resistance at temperatures from -400°F to 550°F.

<p><b>APPROXIMATE PROPERTIES</b></p> <ul style="list-style-type: none"> <li>1. Coefficient of friction: 0.15</li> <li>2. Surface roughness: 0.001</li> <li>3. Surface porosity: 0.001</li> <li>4. Surface wear: 0.001</li> <li>5. Surface hardness: 1000</li> <li>6. Surface adhesion: 1000</li> <li>7. Surface conductivity: 10<sup>12</sup> ohm-cm</li> <li>8. Surface dielectric constant: 2.5</li> <li>9. Surface dielectric strength: 1000</li> <li>10. Surface dielectric loss: 0.001</li> <li>11. Surface dielectric constant: 2.5</li> <li>12. Surface dielectric loss: 0.001</li> <li>13. Surface dielectric constant: 2.5</li> <li>14. Surface dielectric loss: 0.001</li> </ul>	<p><b>APPROXIMATE PROPERTIES</b></p> <ul style="list-style-type: none"> <li>1. Surface roughness: 0.001</li> <li>2. Surface porosity: 0.001</li> <li>3. Surface wear: 0.001</li> <li>4. Surface hardness: 1000</li> <li>5. Surface adhesion: 1000</li> <li>6. Surface conductivity: 10<sup>12</sup> ohm-cm</li> <li>7. Surface dielectric constant: 2.5</li> <li>8. Surface dielectric strength: 1000</li> <li>9. Surface dielectric loss: 0.001</li> <li>10. Surface dielectric constant: 2.5</li> <li>11. Surface dielectric loss: 0.001</li> <li>12. Surface dielectric constant: 2.5</li> <li>13. Surface dielectric loss: 0.001</li> <li>14. Surface dielectric constant: 2.5</li> <li>15. Surface dielectric loss: 0.001</li> </ul>
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**ENGINEERING PROPERTIES**

<p><b>PROPERTY</b></p> <p>Surface roughness: 0.001</p> <p>Surface porosity: 0.001</p> <p>Surface wear: 0.001</p> <p>Surface hardness: 1000</p> <p>Surface adhesion: 1000</p> <p>Surface conductivity: 10<sup>12</sup> ohm-cm</p> <p>Surface dielectric constant: 2.5</p> <p>Surface dielectric strength: 1000</p> <p>Surface dielectric loss: 0.001</p> <p>Surface dielectric constant: 2.5</p> <p>Surface dielectric loss: 0.001</p> <p>Surface dielectric constant: 2.5</p> <p>Surface dielectric loss: 0.001</p>	<p><b>LECTROFLUOR 615</b></p> <p>Surface roughness: 0.001</p> <p>Surface porosity: 0.001</p> <p>Surface wear: 0.001</p> <p>Surface hardness: 1000</p> <p>Surface adhesion: 1000</p> <p>Surface conductivity: 10<sup>12</sup> ohm-cm</p> <p>Surface dielectric constant: 2.5</p> <p>Surface dielectric strength: 1000</p> <p>Surface dielectric loss: 0.001</p> <p>Surface dielectric constant: 2.5</p> <p>Surface dielectric loss: 0.001</p> <p>Surface dielectric constant: 2.5</p> <p>Surface dielectric loss: 0.001</p>
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# Food and Environmental Hazards To Health

## Hemorrhagic Colitis and Hemolytic Uremic Syndrome Caused by *Escherichia Coli* 0157:H7 in Canada

Reports of outbreaks of hemorrhagic colitis appeared in the press in unprecedented numbers in the summer of 1987 with nursing home outbreaks and community-wide outbreaks of "hamburger disease". LCDC Field Epidemiologists have been involved in the investigation of 4 outbreaks, including perhaps the largest community outbreak of diarrhea due to verotoxin-producing *E. coli* ever seen in Canada.

Infections due to *E. coli* 0157:H7 are officially reportable in some provinces but they are not on the list of 40 conditions reported by the provinces to Statistics Canada. Through a special arrangement with Alberta, all cases of hemorrhagic colitis or hemolytic uremic syndrome (HUS) notified in that province are reported to LCDC on a weekly basis, along with other reportable diseases. Voluntary reporting of human isolates to the Enteric Reference Centre, LCDC, provides almost complete national coverage.

There has been an exponential rise in isolations of *E. coli* 0157:H7 in Canada, with the number more than doubling each year since 1982 to 750 in 1986. In the first 7 months of 1987 there have been 743 isolates reported to LCDC, double the number reported for the same period in 1986. Isolates of *E. coli* 0157:H7 account for an increasing proportion of all human enteric pathogens referred or reported to LCDC (3.6% in 1986) and now represent the majority of pathogenic *E. coli*. Much of this increase has resulted from an increasing interest in and capability for isolating this organism. Recognized outbreaks have been responsible for only a small proportion of isolates in the past 2 years and "sporadic" cases have been increasingly recognized in most provinces, but mainly in British Columbia, Alberta, Ontario, and Quebec.

Based on laboratory data, the incidence of *E. coli* 0157:H7 shows a marked seasonal pattern with a peak incidence from June through September. Unlike *Salmonella* infections, there is no increase in the number of cases following the December holiday period. These data are corroborated by an examination of the dates of onset of symptoms for Alberta cases. The small number of cases of HUS reported in Alberta in 1986 follow the same pattern; 14 of 15 reported cases had onset in June-September.

Susceptibility to *E. coli* 0157:H7 appears to be general, based on the occurrence of sporadic cases and community outbreaks. However, young children and the elderly appear to be more susceptible to complications. There have been at least 8 outbreaks in nursing homes in Canada involving more than 148 cases of hemorrhagic colitis and 23 deaths since 1982. In larger institutional and community out-

breaks, HUS has occurred in from 9% to 17% of cases. A brief summary of 4 of the outbreaks follows this overview.

Few outbreaks have been associated with specific foods, although undercooked meats have often been suspected. In one recent (June 1987) outbreak, leftover ground beef was found positive for the outbreak strain of *E. coli* 0157:H7. Raw milk was implicated as a vehicle in a kindergarten outbreak, but the only positive environmental samples were calf feces from a farm visited by the school children. Animal specimens positive for this serotype in Canada include calf feces and ground beef from outbreaks, veal sausage, and beef and pork samples from surveys of slaughterhouses.

Can Dis Weekly Rept 11/14/87

### An Outbreak of *E. coli* 0157: Diarrhea at a Girls' Camp - Ontario

On 19 July 1987, a 10-year-old female camper was referred to a Toronto hospital with bloody diarrhea and *E. coli* 0157:H7 was isolated from her stools. The camp population comprised 151 girls age 7 to 15, and 121 staff. Half of the campers, including the index case, had been at the camp since 5 July and the remainder had arrived on 17 July. Staff and contacts of symptomatic cases were screened by culture and free fecal verotoxin. No one else had bloody diarrhea, but 47 campers and 54 staff reported having had diarrhea in the period 19-26 July. *E. coli* 0157:H7 was isolated from stools of 9 individuals, 6 of whom had symptoms. Three phage types (1, 4 and 21) were identified. Five isolates of *E. coli* 0157:H16 (non-verotoxigenic) were obtained, but only one of these persons was symptomatic.

No common association was found to support foodborne transmission with the camp. Water sources and sewage disposal met current standards. The large number of cases, with few confirmed as *E. coli* 0157:H7, suggests that multiple organisms may have been responsible for the outbreak. The camp had been scheduled to close on 31 July and 1 August and illness did not reappear when new campers arrived on 2 August.

Can Dis Weekly Rept 11/14/87

### An Outbreak of *E. coli* 0157:H7 Diarrhea in a Nursing Home - Ontario

During the investigation, in July 1987, of a nursing home case of *Salmonella heidelberg*, 7 other elderly residents with diarrhea were identified. Four of them had been admitted to the hospital with bloody diarrhea from which *E. coli* 0157:H7 has been isolated. The institution is a modern complex with 88 nursing beds, 47 intermediate care beds and 240 apartment residents.

Fifteen cases were identified, 9 of which were confirmed by culture. All isolates were phage type 1 and biotype 3. The highest attack rate was 4.8% among the nursing home residents (6 cases). Five cases occurred in apartment dwellers (1.7%) and 4 among staff (2.8%). One elderly case developed a pericaecal abscess which resolved in hospital.

Can Dis Weekly Rept 11/14/87

### **Hemorrhagic Colitis and Hemolytic-Uremic Syndrome - Quebec**

Since May 1987, there has been a significant increase in the incidence of hemorrhagic colitis due to *E. coli* 0157:H7 in the Montreal region. This increase has been recognized in several areas and is most pronounced in the *Charles Lemoyne Cite de la Sante* Department of Health. Several communities around Montreal are also affected. As of 30 October, 113 cases have been culture confirmed. In 1986, a total of 16 human isolates of *E. coli* 0157:H7 were identified in the province.

Cases have been seen in all age groups, but the majority are either children under 10 years or the elderly. Among confirmed cases, over half have been hospitalized. Four cases of hemolytic-uremic syndrome have occurred among the confirmed cases. Preliminary epidemiological evidence gathered from case interviews suggested an association with consumption of ground beef. A case-control study is being conducted in an attempt to elucidate the reasons for the sharp increase in cases this summer.

Can Dis Weekly Rept 11/14/87

### **An Outbreak of *E. coli* 0157:H7 Diarrhea in a Nursing Home - Alberta**

Between 6 and 8 June, 1987, 15 of 90 residents of a nursing home complex in a rural health unit became ill with diarrhea and cramps. Seven of the cases occurred among residents of an auxiliary hospital unit attached to the home. The majority of cases had bloody diarrhea associated with severe abdominal cramps and *E. coli* 0157:H7 was the only pathogen isolated from 10 cases. Two of the 15 cases died, but it is not clear what role, if any, the infection had in either case. The remaining cases recovered without complication. Two nursing staff reported having diarrhea on 5 June, but no staff cases were confirmed on culture.

Epidemiological inquiry indicated a probable point source outbreak. Control measures focused on food preparation practices, isolation of infected resident cases and the exclusion of staff with diarrhea. Culture of stool specimens submitted by staff failed to yield *E. coli* 0157:H7. Among the food specimens examined were frozen hamburger patties which yielded significant growth of sorbitol-negative *E. coli* when plated directly to sorbitol MacConkey agar at 35°C for 24 hours. These were confirmed as *E. coli* 0157:H7, phage type 1, biotype 3 by the Enteric Reference Centre, LCDC. Nine of the 10 isolates from cases were phage type 1, biotype 3; the other, obtained from a vegetarian, was phage type 4. Ground beef from the same side of beef had been used in a meat loaf meal on 4 June and in a

casserole on 6 June.

Can Dis Weekly Rept 11/14/87

### **Outbreak of Viral Gastroenteritis-Pennsylvania and Delaware**

Within 48 hours of the University of Pennsylvania-Cornell University football game in Philadelphia on September 19, 1987, 158 student with symptoms of gastrointestinal illness visited the university health service. Band members from both universities, Cornell football players, and spectators, including visiting students and university staff and faculty had similar symptoms.

Nine-nine percent of the 158 students visiting the university health service reported nausea; 75% reported vomiting; 48% diarrhea; 22%, headache; 17%, fever; 18%, chills; and 14%, myalgia. The mean incubation period was 36 hours; symptoms lasted 12 to 48 hours. Ninety-two percent of the students had purchased soda with ice cream from the stadium concessionaire.

None of the Pennsylvania football team members were affected until September 24 and 25, when 55 became ill. The Pennsylvania football team had used ice from a different source at the September 19 game. However, during practice on September 23, the team used ice supplied by the distributor that had provided the stadium concessionaire's ice on September 19.

On September 21, a physician notified the Delaware Department of Health and Social Services of another outbreak of gastroenteritis among 750 people who attended a museum fund-raiser in Wilmington, Delaware. Attendees were served food and iced drinks, most of which contained alcohol. The ice was traced to the same manufacturer that had supplied the concessionaire in Philadelphia.

Questionnaires were completed by University of Pennsylvania undergraduates, football players, and band members, and by participants at the Delaware fund-raiser to examine the relationship of food, drink, and ice consumption to the development of gastrointestinal illness. In each study, ice was significantly associated with illness. The attack rate for those consuming ice in the Pennsylvania outbreak was 62%, while 10% of those not consuming ice were ill (relative risk [RR] = 6.03; 95% confidence interval [CI], 4.66-7.50). In the Delaware outbreak, the attack rate was 61% for those consuming ice and 16% for those not consuming ice (RR = 3.65; 95% CI, 1.96-6.77).

The ice was traced to a manufacturer in southeastern Pennsylvania whose wells had been flooded by waters from Conestoga Creek following a torrential rainfall on September 8. Ice produced at this factory following the flood was sold to distributors serving Pennsylvania, Delaware, and New Jersey. Pennsylvania and Delaware health department laboratories found high concentrations of fecal coliforms in both the ice and the well water used to produce the ice. An increase in diarrheal illness was also noted among residents along Conestoga Creek who obtained their drinking water from private wells that were also flooded. No source of fecal contamination of the creek has been identified.

No bacterial pathogens were identified from any of the

con't. on pg. 475

## Benefit from Knowledge of Industry Experts

**REDFERN**  
& ASSOCIATES

### Proposed Annual Programs 1988 - 1989

**Laboratory Methods & Management for Dairy & Food Industry.** September 19-21, 1988, Raleigh, NC. •NEW COURSE - How to protect Dairy & Food products from contamination. This program presents tests that are musts for in-house and commercial labs, tells what information is required to give F.D.A., new procedures for Salmonella and Listeria tests, presentation of Millipore Filtration technique and lab safety requirements.

**Waste Management & Environmental Controls.** September 26-28, 1988, Knoxville, TN. •NEW COURSE - Waste and the Environment, including fat loss and volume control, B.O.D. control, how scheduling can reduce waste, how proper planning on plant layout can prevent losses, **plus a visit to a modern state of the art dairy plant.**

**Refrigeration, Steam Generation, Safety and Maintenance for Dairy & Food Plant Engineers.** November 14-17, 1988, Knoxville, TN. •NEW COURSE - Fundamentals of vapor systems, steam generation, boiler efficiency, steam system safety, refrigeration systems, humidity control, ammonia safety, accident prevention and hazard communication. Waste management, waste treatment and preventive maintenance programming and execution are also included. The teaching staff is composed of internationally known experts with hands-on experience. This course is designed for plant engineers and maintenance personnel who manage the engineering and maintenance functions of dairy and food processing plants, and those who purchase equipment.

**Cultured Dairy Products Technology.** January 16-19, 1989, Raleigh, NC. •NEW COURSE - brought back back by popular demand. Demonstration of cottage cheese making in a modern cultured products plant, culture programs for buttermilk, cottage cheese, yogurt and sour cream and sensory evaluation of all products in the market place are included.

**Ice Cream Technology.** February 13-16, 1989, Raleigh, NC. Our most popular course, in its 16th year, provides everything you need to know about ice cream formulation, mix making, freezing, packaging, hardening, sanitation, flavoring and tasting (judging). Discussions on quality control, waste management, processing equipment and various frozen desserts/novelties take place, as well. **Special In 1989** is a one day session for those whose primary interest is in soft-serve and dipping store operations. The special session will be on February 15 and will run currently with the general course. Participants may register for the entire course and attend either session, or they may register for the one day session.

#### **Enrollments Are Now Being Accepted!**

Program participation in each course is limited. Course details available upon request. Contact Ms. Terry Johnson at (919) 787-8496 or 787-8400 for immediate response or write to:

**REDFERN & ASSOCIATES Ltd.**  
5151 Glenwood Ave., P.O. Box 31108 • Raleigh, NC 27612  
FAX: 919-782-1139 • TELEX: 4496995 FMI UI

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stool samples, but a 27-nm virus-like particle was identified in a sample from a University of Pennsylvania student. Serologic studies of several affected groups are pending.

At the request of the U.S. Food and Drug Administration, the manufacturer recalled ice produced after the flooding. Based on distribution records and the Pennsylvania attack rate, more than 5,000 people may have become ill from consumption of the 60-300 tons of ice produced in the week following the flood. Macaroni salad and gelatin prepared with ice from the manufacturer were also recalled. The manufacturer agreed to decontaminate its wells and machinery before resuming production.

**Editorial Note:** Ice has rarely been implicated as a vehicle of infection. Its identification as the source in these outbreaks has raised several concerns. The high attack rates of diarrhea among people who ingested ice with alcoholic or carbonated beverages are striking because each of these beverages should have some disinfectant effect. Furthermore, since ice is not consistently controlled by any state or federal agency, jurisdiction for maintaining the quality of commercially produced ice or for recalling already distributed ice is unclear. Some of the containers of ice involved in the Pennsylvania and Delaware outbreaks did not carry labels identifying the manufacturer, and none were marked with the production date. Consequently, tracing the extent of the outbreak and determining which ice to recall was difficult.

This outbreak was characteristic of diarrheal illness caused by viruses other than rotaviruses. There were high rates of nausea, vomiting, and diarrhea; the incidence of fever was low; and incubation periods and lengths of illness were short. Stool samples contained no bacterial agents.

Norwalk agent has been identified as the causative agent in 42% of 74 past U.S. diarrhea outbreaks of non-bacterial origin, on the basis of a fourfold rise in antibody titer. Other viral agents identified in U.S. outbreaks include the Snow Mountain and Marin County agents (astrovirus-serotype 5). Viral agents associated with outbreaks in other countries, such as caliciviruses, other astroviruses, and non-group A rotaviruses, have not been known to cause outbreaks of diarrheal illness in the United States, perhaps because of current methods of specimen collection, handling, and processing.

Most stool specimens from field investigations are frozen before examination. The finding of a 27-nm virus-like particle in a freshly collected, refrigerated (+4°C) stool sample may support recent changes in thinking about collection and storage of such specimens. Although deep freezing (-70°C) maintains the viability of some viruses, it also causes a loss of definition of their structure. Examination of fresh, loose, large-volume, refrigerated specimens may be the key to identifying the causative agent in future investigations. Further laboratory studies are being conducted to characterize and identify the agent involved in these outbreaks.

MMWR 11/6/87



**N.M.C.**

NATIONAL MASTITIS COUNCIL

Bedding materials contribute to mastitis

Bedding represents a significant source of teat and exposure to coliform bacteria and species of streptococci than *Streptococcus agalactiae*. These bacteria are frequent causes of udder infection and clinical mastitis in dairy herds, and they are poorly controlled by teat dipping and dry cow therapy. There are numerous reports in the scientific literature showing an association between elevated numbers of coliform bacteria in bedding and increased incidence of coliform mastitis.

Bacteria require a food source, moisture and warmth in order to grow. Organic bedding materials are an excellent food source, and the dairy barn environment provides the moisture and appropriate temperature to support growth.

Numbers of coliform and environmental streptococci are frequently very low in fresh bedding when placed in stalls. However, these bacteria are ubiquitous in the environments of dairy cows, and the bedding quickly is contaminated. Rapid growth follows, and maximum numbers generally are detected within 24 to 72 hours. Growth may be more rapid when temperature and moisture are elevated and when fresh material is added directly to heavily contaminated bedding. Coliform numbers are higher in summer than in winter but streptococcal numbers appear to be less influenced by season of the year.

Used bedding materials including sawdust, chopped straw, long straw, pelleted corn cobs, peanut hulls and recycled manure solids almost always have coliform and streptococcal numbers in excess of 1 million per gram of bedding and frequently exceed 10 million per gram. By contrast, inorganic materials such as sand or crushed limestone almost always have fewer than 1 million coliform bacteria per gram.

Generally, numbers of *Klebsiella* bacteria in sawdust bedding always are higher than numbers in chopped straw or long straw. Green sawdust frequently is contaminated heavily with *Klebsiella* before being placed in stalls and often has been associated with outbreaks of *Klebsiella* mastitis. Streptococcal numbers generally always are greater in long straw or chopped straw than in sawdust.

Attempts to reduce or control bacterial numbers in organic bedding materials by adding lime or other chemicals have not been successful. Total daily removal of bedding the back 1/3 of free stalls, followed by the application of a light layer of bedding will reduce bedding bacterial numbers. Thorough composting and drying of manure solids and green sawdust will reduce initial bacterial numbers but they will become contaminated and support bacterial growth when placed in stalls.

When sand or crushed limestone can not be used as bedding, make every effort to keep organic bedding materials as dry as possible. Free stalls should be maintained at least daily by removing manure and areas of wet or damp bedding. Alleyways should be scraped frequently to reduce the amount of manure and urine in the environment. Good ventilation will help keep bedding materials dry.

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703-243-8268

# Affiliate News

## Tennessee Association of Milk, Water and Food Protection Annual Meeting

The ninth annual meeting of the Tennessee Affiliate was held at the Ramada Inn - Airport in Nashville, Tennessee on June 1, 1988. The meeting was opened by David Mayfield, President, who introduced the first session chairman, Ed Miller. Special reports were presented by J. Carroll Sellers on Food Service Inspection Programs; by Sylvester David on Pesticide Regulation in the Food Industry; by Susan Duncan on Effects of Enzymes on Rancidity; and by Joe Richardson on Water Quality Control in Agriculture. The noon luncheon speaker was Bob Basse of the Southeast United Dairy Industry Association who spoke on Dairy Promotion Update.

Service Awards were presented to out-going President David Mayfield and to the American Dairy Association representative Bob Basse.

A panel discussion on Dairy Regulatory Programs as viewed by the Dairy Farmer, the Milk Processor, the Dairy Inspector and the Consumer was chaired by John Sanford. The participants were Jack Edgmon, a dairy farmer; Dave Simmler, a milk processor; Dan Alexander, a dairy inspector; and Representative Jan Bushing, a consumer and state legislator.

President Mayfield then held a short business session during which new officers were elected and installed. Dr. Bill Byrne ended the meeting by presenting door prizes to persons holding the lucky tickets.



In recognition for his services to the Affiliate, David Mayfield, (L) Out-going President, receives a plaque from Dennis Lampley, (R) Secretary of the Affiliate.

## Upcoming IAMFES Affiliate Meetings

### OCTOBER

6, OHIO ASSOCIATION OF MILK, FOOD & ENVIRONMENTAL SANITARIANS FALL MEETING, will be held in Columbus, OH. For more information, contact D. L. Barrett, 614/222-6195.

18-19, CALIFORNIA ASSOCIATION OF DAIRY & MILK SANITARIANS CONFERENCE, to be held at the Concord Hilton Hotel, Concord, CA. For more information, contact: Jack Coppes, Executive Secretary, PO Box 9234, Whittier, CA 90608, 213/699-4313.

### NOVEMBER

1-3, NORTH DAKOTA ENVIRONMENTAL HEALTH ASSOCIATION ANNUAL FALL CONFERENCE, to be held at the Holiday Inn, Minot, ND. For more information, contact: Peri Dura 701/224-2382.



David Moss, In-coming President.



In recognition of his contributions to the Affiliate and the Industry of Tennessee, Bob Basse receives a plaque from Dennis Lampley, Secretary of the Affiliate.





*John Sanford chairman for the panel discussion on Dairy Regulatory Programs.*



*Bob Basse of the Southeast United Dairy Industry Association.*

## ***IAMFES Secretary Nominations Due for 1989 Elections***

Nominations are now being taken for Secretary for IAMFES. This year an academia representative will be elected.

Once all nominations are received by the nominating committee, two persons will be chosen to run for the office. This is a five year term, moving up yearly until he or she is President of IAMFES, then serving one year after as Past President. The term of office begins the last day of the 1989 Annual Meeting, this year held at the Hyatt Regency Crown Center, Kansas City, MO, August 13-17, all IAMFES Executive Board Members meet three times a year.

Two people selected are placed on the ballot. The winner is determined by majority vote of the membership through a mail vote, in the spring of 1989.

Please send a biographical sketch and photograph NO LATER THAN OCTOBER 18, 1988 to the Nominations Chairperson:

**Dr. Elmer H. Marth  
Chairman, IAMFES Nominating Committee  
Dept. of Food Science, University of Wisconsin  
1605 Linden Dr.  
Madison, WI 53706  
608-263-2004**

# IAMFES Audio Visuals Library

## A Free IAMFES Members' Benefit

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Other food and environmental audio-visuals should be available soon.

If you are interested in checking out any of our audio-visuals, contact: Margie Marble, PO Box 701, Ames, IA 50010, 800-525-5223 (outside Iowa), 515-232-6699, IAMFES Members Only.

# New IAMFES Members

## *Arkansas*

**T.L. Davis**  
ConAgra Frozen Foods  
Russellville

**Edward Raymond**  
Tyson Foods, Inc.  
Springdale

## *California*

**Mark Imsland**  
Carnation Dairies  
Bakersfield

## *Connecticut*

**Larry Keener**  
Ragu Foods  
Shelton

## *Florida*

**Lynn A. Francis**  
USAF  
Niceville

**Thomas L. Kirby**  
Project HOPE  
Ormond Beach

## *Georgia*

**Mark E. Berrang**  
University of Georgia  
Griffin

## *Kansas*

**Jack W. Maybe**  
Environmental Dept.  
Olathe

## *Maryland*

**Connie M. Caffes**  
Dairymen, Inc.  
Sykesville

**Robert B. Callaway**  
Nat'l Food Processors Assoc.  
Gaithersburg

**Faye Feldstein**  
Grace Culinary Systems  
Brentwood

**Webster Young**  
Gaithersburg

## *Maine*

**Sean Ryan**  
AgriTech Systems  
Portland

## *Minnesota*

**Thomas M. Brennan**  
Lloyd's Food Prod.  
St. Paul

**Kevin K. Farnum**  
General Mills, Inc.  
Minneapolis

**Jim Thompson**  
Old Home Foods  
St. Paul

## *Nebraska*

**Dennis Blank**  
NE Dept. of Agric.  
Lincoln

**Steve L. Taylor**  
Univ. of Nebraska  
Lincoln

## *New Jersey*

**Thomas B. Boden**  
NcNeil Specialty Products  
Skillman

## *New York*

**Andrew J. Kornick**  
Equity Group New York  
Division  
Cohoes

**Kathleen Melenbrook**  
Wegman's Food Market  
Rochester

**Steve C. Murphy**  
Cornell University  
Ithaca

**Christopher Vough**  
Dairylea Coop Inc.  
Verona

**Linda Wimpfheimer**  
Cornell University  
Ithaca

## *Ohio*

**Hans Schmalzried**  
Henry & Fulton Counties  
Health Dept.  
Swanton

## *Oklahoma*

**Al Depee**  
Braum Ice Cream  
Tuttle

## Pennsylvania

Dennis L. Altland  
Wawa, Inc.  
Wawa

Gregory J. Baumann  
Leaf, Inc.  
Pittsburgh

Pete Cordaro  
Hagan Ice Cream Co.  
Uniontown

Steve Erhard  
C & S Foods  
Philadelphia

Barbara Salg  
Turkey Hill Dairy, Inc.  
Conestoga

## Tennessee

Sam Escue  
Kroeger Food Safety  
Memphis

Nathan McFerrin  
Mayfield Dairy Farms, Inc.  
Athens

## Virginia

Wyatt W. Gosnell  
Environmental Systems  
Service, Ltd.  
Culpeper

C.M. Hodges  
Martinsville

Dwain H. Mays  
Gate City

Philip W. Parsons  
Culpeper

C.K. Spruill  
Richmond

## Wisconsin

Heather Hemmes  
The Swiss Colony  
Monroe

Ken Kohlwey  
Cedar Crest Ice Cream  
Manitowoc

Janice Schmid  
Arpin Dairy, Inc.  
Arpin

Terry L. Thayse  
Gold Bond Ice Cream  
Green Bay

## Barbados

Basil Pilgrim  
Bridgetown, St. Michael

## Canada

Eugene Crane  
Mount Pearl, Newfoundland

Mary Ann Lane  
Beatrice Foods  
Oshawa, Ontario

## New Zealand

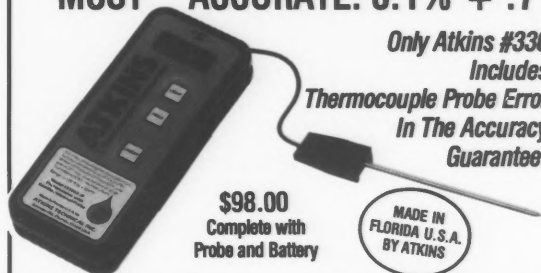
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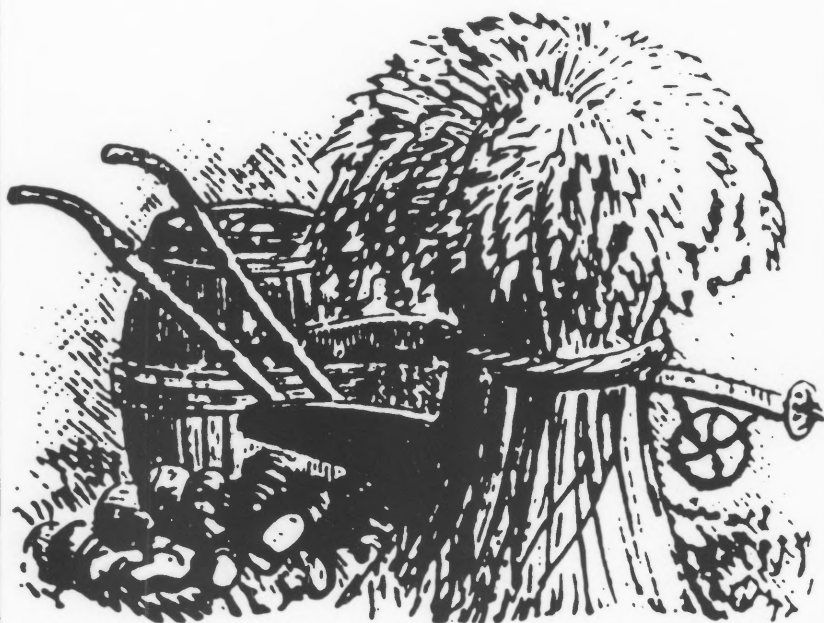
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# Dairy and Food Sanitation Instructions for Authors

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## Nature of the Magazine

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*Dairy and Food Sanitation* is a monthly publication of the International Association of Milk, Food and Environmental Sanitarians, Inc. (IAMFES). It is targeted for persons working in industry, regulatory agencies, or teaching in milk, food and environmental protection.

The major emphases include: 1) practical articles in milk, food and environmental protection, 2) new product information, 3) news of activities and individuals in the field, 4) news of IAMFES affiliate groups and their members, 5) 3-A and E-3-A Sanitary Standards, amendments, and lists of symbol holders, 6) excerpts of articles and information from other publications of interest to the readership.

Anyone with questions about the suitability of material for publication should contact the editor.

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## Submitting Articles

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All manuscripts and letters should be submitted to the Editor, Kathy R. Hathaway, IAMFES, P.O. Box 701, Ames, Iowa 50010.

Articles are reviewed by two members of the editorial board. After review, the article is generally returned to the author for revision in accordance with reviewer's suggestions. Authors can hasten publication of their articles by revising and returning them promptly. With authors' cooperation articles are usually published within three to six months after they are received and may appear sooner.

Membership in IAMFES is not a prerequisite for acceptance of an article.

Articles, when accepted, become the copyright property of *Dairy and Food Sanitation* and its sponsoring association. Reprinting of any material from *Dairy and Food Sanitation* or republishing of any papers or portions of them is prohibited unless permission to do so is granted by the editor.

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## Reprints

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Reprints of an article may be ordered by the author. An order form for reprints will be sent to you. Reprints may be ordered with or without covers, in multiples of 100. Reprint costs vary according to the number of printed pages in the article. Reprints cannot be provided free of charge.

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## Types of Articles

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*Dairy and Food Sanitation* readers include persons working as sanitarians, fieldmen or quality control persons for industry, regulatory agencies, or in education. *Dairy and Food Sanitation* serves this readership by publishing a variety of papers of interest and usefulness to these persons. The following types of articles and information are acceptable for publication in *Dairy and Food Sanitation*.

### General Interest

*Dairy and Food Sanitation* regularly publishes nontechnical articles as a service to those readers who are not involved in the technical aspects of milk, food and environmental protection. These articles deal with such topics as the organization and application of a milk or food control program or quality control program, ways of solving a particular problem in the field, organization and application of an educational program, management skills, use of visual aids, and similar subjects. Often talks and presentations given at meetings of affiliate groups and other gatherings can be modified sufficiently to make them appropriate for publication. Authors planning to prepare general interest nontechnical articles are invited to correspond with the editor if they have questions about the suitability of their material.

### Book Reviews

Authors and publishers of books in the fields covered by *Dairy and Food Sanitation* are invited to submit their books to the editor. Books will then be reviewed and published in an issue of *Dairy and Food Sanitation*.

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## Preparation of Articles

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All manuscripts should be typed, double-spaced, on 8½ by 11 inch paper. Side margins should be one inch wide.

The title of the article should appear at the top of the first page. It should be as brief as possible and contain no abbreviations.

Names of authors and their professions should follow under the title. If an author has changed location since the article was completed, his new address should be given in a footnote.

## Illustrations, Photographs, Figures

Wherever possible, submission of photos, graphics, or drawings to illustrate the article will help the article. The nature of *Dairy and Food Sanitation* allows liberal use of such illustrations, and interesting photographs or drawings often increase the number of persons who are attracted to and read the article.

Photographs which are submitted should have sharp images, with good contrast.

## Examples of Proper Bibliographic Citations

### Paper in a journal

Alderman, G. G. and E. H. Marth. 1974. Experimental production of aflatoxin in citrus juice and peel. *J. Milk Food Technol.* 37:308-313.

### Paper in a book

Marth E. H. 1974. Fermentations. pp. 771-882. In B. H. Webb, A. H. Johnson, and J. A. Alford (eds.) *Fundamentals of dairy chemistry* (2nd ed.), AVI Publishing Co., Westport, CT.

### Book

Fennema, O. R., W. D. Powrie, and E. H. Marth. 1973. *Low-temperature preservation of foods and living matter.* Marcel Dekker, Inc., New York. 598 p.

### Patent

Hussong, R. V., E. H. Marth, and D. G. Vakaleris. 1964. Manufacture of cottage cheese. U.S. Pat. 3,117,870. Jan. 14.

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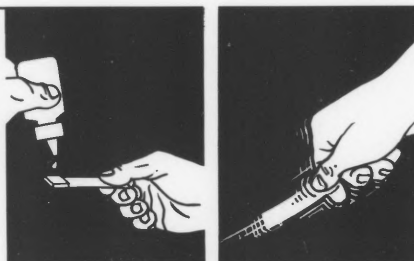
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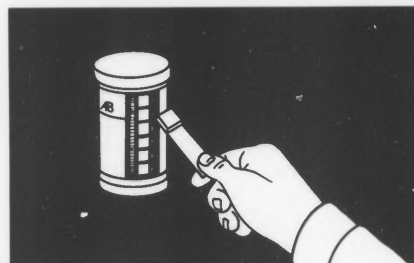
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# 3-A Standards

## Holders of 3-A Symbol Council Authorization on August 15, 1988

Questions or statements concerning any of the holders authorizations listed below, or the equipment fabricated, should be addressed to: Robert F. Wolf, Administrative Officer, 3-A Symbol Council, W255 N477 Grandview Blvd., Suite 100, Waukesha, Wisconsin 53188.

### 01-06 Storage Tanks for Milk and Milk Products

115	A-L Stainless Inc. (Not available in USA) 113 Park St., South Peterborough, Ontario Canada K9J 3R8	(9/28/58)	1400 West Gale Galesville, Wisconsin 54630	
2	APV Crepaco, INC. 100 South CP Ave. Lake Mills, Wisconsin 53551	(5/1/56)	29R Cherry-Burrel Corp. (A Unit of AMCA Int'l., Inc.) 2400-6th St. SW, P.O. Box 3000 Cedar Rapids, Iowa 52406	(10/3/56)
28	Cherry-Burrel Corporaton (A Unit of AMCA Int'l., Inc.) 575 E. Mill St. Little Falls, New York 13365	(10/3/56)	205R Dairy Equipment Co. 1919 S. Stoughton Rd., P.O. Box 8050 Madison, Wisconsin 53716	(5/22/69)
102	Chester-Jensen Co., Inc. 5th & Tilghman Sts., P.O. Box 908 Chester, Pennsylvania 19016	(6/6/58)	377 Energy Service Co. B200 Walker Bldg., 734 15th St., NW Washington, DC 20005	(2/4/83)
117	DCI, Inc. P.O. Box 1227, 600 No. 54th Ave. St. Cloud, Minnesota 56301	(10/28/59)	462 Enprotech Corporation 335 Madison Avenue New York, New York 10017	(12/5/85)
76	Damrow Company (A Div. of DEC Int'l., Inc.) 196 Western Ave., P.O. Box 750 Fond du Lac, Wisconsin 54935-0750	10/31/57)	466 Fluid Metering Inc. 29 Orchard St. Oyster Bay, New York 11771	(1/10/86)
172	Paul Mueller Co. P.O. Box 828 Springfield, Missouri 65801	(6/29/60)	306 FRISTAM PUMPS, INC. 2410 Parview Road Middleton, Wisconsin 53562	(5/2/78)
440	Scherping Systems 801 Kingsley St. Winsted, Minnesota 55395	(3/1/85)	65R G & H Products Corp. 7600-57th Avenue P.O. Box 1199 Kenosha, Wisconsin 53141	(5/22/57)
432	TCI-Superior Division, Mueller Canada Inc. 6500 Northwest Dr. Mississauga, Ontario, Canada L4V 1K4	(11/9/84)	492 A. Gusmer Inc. Mfg. by Philip Hilge GmbH 27 North Avenue East Cranford, New Jersey 07016	(1/15/87)
31	Walker Stainless Equipment Co., Inc. Elroy, Wisconsin 53929	(10/4/56)	145R ITT Jabsco Products (Mfg. by ITT Jabsco, England) 1485 Dale Way Costa Mesa, California 92626	(11/20/63)

### 02-08 Pumps for Milk and Milk Products

63R	AVP Crepaco, INC. 100 South CP Ave. Lake Mills, Wisconsin 53551	(4/29/57)	502 INOXPA, S.A. (not available in USA) c/. Telers, 54 17820 Banyoles (Verona) Spain	(4/27/87)
325	Albin Pump, Inc. (Mfg. by Albin Motor, Sweden) 120 Interstate N. Pkwy. E. #208 Atlanta, Georgia 30339-2103	(12/19/79)	314 Len E. Ivarson, Inc. 3100 W. Green Tree Rd. Milwaukee, Wisconsin 53209	(12/22/78)
214R	Ben H. Anderson Manufactures Morrisonville, Wisconsin 53571	(5/20/70)	373 Luwa Corporation (Mfg. by MAAG Gear, Switzerland) P.O. Box 16348 Charlotte, North Carolina 28297-6348	(12/27/82)
212R	Babson Brothers Company Dairy Systems Division	(2/20/70)	364 M D Pneumatics, Inc. 4840 W. Kearney Springfield, Missouri 65803	(7/28/82)
			319 MGI PUMPS INC. (Mfg. by SSP Pumps, England) 847 Industrial Dr. Bensenville, Illinois 60106	(3/21/79)
			148R Moyno Industrial Products of Robbins & Meyers, Inc. 1895 Jefferson St. Springfield, Ohio 45506	(4/22/64)

400	Netzsch Incorporated 119 Pickering Way Exton, Pennsylvania 19341-1393	(8/15/83)	<b>04-03 Homogenizers and High Pressure Pumps of the Plunger Type</b>		
375	Niro Atomizer Food & Dairy Inc. (Mfg. by Pasilac, Denmark) 1600 County Road F Hudson, Wisconsin 54016	(1/25/83)	37	AVP Crepaco, INC. 100 South CP Ave. Lake Mills, Wisconsin 53551	(10/19/56)
404	PACKO INOX N.V. (Not available in USA) Torhoutsesteenweg 154 B8210 Zedelgem (Belgium)	(8/24/83)	75	APV Gaulin, Inc. 44 Garden St. Everett, Massachusetts 02149	(9/26/57)
241	Puriti, S.A. de C.V. (not available in USA) Alfredo Nobel 39 Industrial Puente de Vigas Tlalnepantla, Mexico	(9/12/72)	390	American Lewa, Inc. (Mfg. by Lewa, Germany) 132 Hopping Brook Road Holliston, Massachusetts 01760	(6/9/83)
364	Roper Pump Company (Mfg. by Howard Pump Co., England) P.O. Box 269 Commerce, Georgia 30529	(7/28/82)	247	Bran & Luebbe, Inc. 1025 Busch Parkway Buffalo Grove, Illinois 60015	(4/14/73)
507	Sine Pump Division of The Kontro Co., Inc. 500 West River Street Orange, Massachusetts 01364	(7/21/87)	87	Cherry-Burrell Corp. (A Unit of AMCA Int'l., Inc.) 2400-6th St., SW, P.O. Box 3000 Cedar Rapids, Iowa 52406	(12/20/57)
332	Superior Stainless, Inc. 611 Sugar Creek Rd. Delavan, Wisconsin 53115	(12/10/80)	486	Kol-Flo Corporation 320 N. Jensen Road Vestal, New York 13850	(11/18/86)
72R	L. C. Thomsen & Sons, Inc. 1303-43rd St. Kenosha, Wisconsin 53140	(9/14/57)	309	Niro Atomizer Food & Dairy Inc. (Mfg. by Masinfabriken, Denmark) 1600 County Road F Hudson, Wisconsin 54016	(7/19/78)
219	TCI-Superior Division, Mueller Canada Inc. 6500 Northwest Dr. Mississauga, Ontario, Canada L4V 1K4	(2/15/72)	425	TCI-Superior Division (Not available in USA) Mueller Canada Inc. 6500 Northwest Dr. Mississauga, Ontario, Canada L4V 1K4	(8/31/84)
26R	Tri-Clover, Inc. 9201 Wilmot Road Kenosha, Wisconsin 53141	(9/29/56)	<b>05-13 Stainless Steel Automotive Milk Transportation Tanks for Bulk Delivery and/or Farm Pick-up Service</b>		
175R	Universal Cooperatives, Dairy Dairy Division U.S. Hwy 33 East/Box 115 Goshen, Indiana 46526	(10/25/56)	379	Bar-Bell Fabricating Co., Inc. RR 2 Mauston, Wisconsin 53948	(3/15/83)
471	VNE Corporation (Mfg. by Pumpen-Und Maschinebau West Germany) 1415 Johnson Street Janesville, Wisconsin 53545	(4/27/86)	70R	Brenner Tank, Inc. 450 Arlington Ave., P.O. Box 670 Fond du Lac, Wisconsin 54935	(8/5/57)
329	Valex Products Corp. 6080 Leland Street Ventura, California 93003	(6/10/80)	45	The Heil Company 1125 Congress Pkwy. P.O. Box 160 Athens, Tennessee 37303-0160	(10/26/56)
52R	Viking Pump-Houdaille, Inc. 406 State St. Cedar Falls, Iowa 50613	(12/31/56)	40	Hills Stainless Steel & Equipment Co., Inc. 505 W. Koehn Street Luverne, Minnesota 56156	(10/20/56)
5R	Waukesha Foundry Division Abex Corporation 1300 Lincoln Avenue Waukesha, Wisconsin 53186	(5/6/56)	66	Kari-Kool Transports, Inc. P.O. Box 538 Beaver Dam, Wisconsin 53916	(5/29/57)
408	Westfalia Systemat (Mfg. by Westfalia, West Germany) 1862 Brummel Drive Elk Grove Village, Illinois 60007	(10/18/83)	201	Paul Krohnert Mfg. Ltd. (not available in USA) 811 Steeles Ave., P.O. Box 126 Milton, Ontario, Canada L9T 2Y3	(4/1/68)
517	Westmoor Ltd./Conde Dairy Equipment P.O. Box 99 West Hamilton Avenue Sherrill, New York 13461	(9/23/87)	305	Light Industrial Design Co., 8631-A Depot Rd. Lynden, Washington 98264	(3/23/78)
			513	Nova Fabricating Inc. Jct. I-94 & Co Road 9 P.O. Box 231 Avon, Minnesota 56310	(8/24/87)
			85	Polar Tank Trailer, Inc.	(12/20/57)

- Holdingford, Minnesota 56340  
 521 R & D Stainless  
 409 S. Hampton  
 Republic, Missouri 65738
- 189 A & L Tougas, Ltee (10/3/66)  
 (not available in USA)  
 1 Tougas St.  
 Iberville, Quebec, Canada
- 25 Walker Stainless Equipment Co. (9/28/56)  
 New Lisbon, Wisconsin 53950
- 437 West-Mark (11/30/84)  
 2704 Railroad Ave., P.O. Box 418  
 Ceres, California 95307
- 08-17 Rev. Fittings Used on Milk and Milk Products  
 Equipment and Used on Sanitary Lines  
 Conducting Milk and Milk Products**
- 349 APN, Inc. (12/15/81)  
 400 W. Lincoln  
 Caledonia, Minnesota 55921
- 260 APV CREPACO, INC. (08-17 A&B) (5/21/75)  
 100 South CP Avenue  
 Lake Mills, Wisconsin 53551
- 450 APV International Limited (8/22/85)  
 (Not available in USA)  
 P.O. Box 4, Manor Royal  
 Crawley  
 West Sussex RH10 2QB  
 England
- 484 APV ROSISTA, INC. (10/22/86)  
 (08-17REV)  
 (08-17B)  
 1325 Samuelson Road  
 Rockford, Illinois 61109
- 291 Accurate Metering Systems, Inc. (6/22/77)  
 (Mfg. by Diessel, Germany)  
 1651 Wilkening Court  
 Schaumburg, Illinois 60173
- 470 Advance Stainless Mfg. Corp. (3/30/86)  
 218 West Centralia Street  
 Elkhorn, Wisconsin 53121
- 380 Allegheny Bradford Corp. (3/21/83)  
 P.O. Box 200 Route 219 South  
 Bradford, Pennsylvania 16701
- 79R Alloy Products Corp. (11/23/57)  
 1045 Perkins Ave., P.O. Box 529  
 Waukesha, Wisconsin 53187
- 245 Babson Brothers Company (2/12/73)  
 Dairy Systems Division  
 1400 West Gale  
 Galesville, Wisconsin 54630
- 443 Badger Meter, Inc. (5/1/85)  
 6116 East 15th Street  
 Tulsa, Oklahoma 74158
- 411 Capital Equipment Corp. (11/15/83)  
 2421 Darwin Road  
 Madison, Wisconsin 53704
- 82R Cherry-Burrell Corp. (12/11/57)  
 (A Unit of AMCA Int'l. Corp.)  
 2400-6th St. SW, P.O. Box 3000  
 Cedar Rapids, Iowa 52406
- 478 CIPRIANAI, INC. (7/31/86)  
 (Mfg. by Fratelli Tassalini, Italy)
- 25201 East La Paz Road  
 Laguna Hills, California 92653
- 528 Dayco Products Inc. (3/16/88)  
 333 West First Street  
 Dayton, Ohio 45402-3042
- 376 Defontaine Inc. (1/25/83)  
 (Mfg. by Defontaine, France)  
 563 A. J. Allen Circle  
 Wales, Wisconsin 53183
- 509 Fitting Speciality (8/7/87)  
 1303 35th Street  
 Kenosha, Wisconsin 53140
- 455 Flowtech Inc. (9/17/85)  
 120 Interstate N. Parkway. E. #208  
 Atlanta, Georgia 30339-2103
- 271 The Foxboro Company (3/8/76)  
 33 Commercial Street  
 Foxboro, Massachusetts 02035
- 67R G & H Products Corp. (6/10/57)  
 7600-57th Avenue  
 P.O. Box 1199  
 Kenosha, Wisconsin 53141
- 287 Hackman-MKT%, Inc. (1/14/77)  
 (Mfg. by Koltech, Finland)  
 100 Pinnacle Way, Suite 165  
 Norcross, Georgia 30071
- 369 IMEX, Inc. (11/3/82)  
 (Mfg. by Lube Corp., Japan)  
 4040 Del Ray Ave. Unit 9  
 Marina del Rey, California 90292
- 454 Jensen Fittings Corp. (9/11/85)  
 107-111 Goundry St.  
 North Tonawanda, New York 14120-5998
- 510 Key Stainless Fittings (8/14/87)  
 1303 35th Street  
 P.O. Box 1676  
 Kenosha, Wisconsin 53140
- 389 Lee Industries, Inc. (5/31/83)  
 P.O. Box 688  
 Philipsburg, Pennsylvania 16866
- 239 Lumaco, Inc. (6/30/72)  
 P.O. Box 688  
 Teaneck, New Jersey 07666
- 200R Paul Mueller Co. (3/5/68)  
 1600 W. Phelps St., Box 828  
 Springfield, Missouri 65801
- 374 Niro Atomizer Food & Dairy Inc. (1/25/83)  
 (Mfg. by Pasilac, Denmark)  
 1600 Country Road F  
 Hudson, Wisconsin 54016
- 483 On-Line Instrumentation, Inc. (10/15/86)  
 Rt. 376, P.O. Box 541  
 Hopewell Junction, New York 12533
- 242 Puriti, S. A. de C.V. (9/12/72)  
 (not available in USA)  
 Alfredo Nobel 39  
 Industrial Puente de Vigas  
 Tlalnepantla, Mexico
- 149R Q Controls Subsid. of Cesco Magnetics (5/18/64)  
 93 Utility Court  
 Rohnert Park, California 94928
- 424 Robert-James Sales, Inc. (8/31/84)  
 P.O. Box 1672, 269 Hinman Ave.  
 Buffalo, New York 14216-0672

- 334 Stainless Products, Inc. (12/18/80) 210 Beaver St.  
1649-72nd Ave., Box 169 P.O. Box 696  
Somers, Wisconsin 53171 Yorkville, Illinois 60560
- 391 Stork Food Machinery, Inc. (6/9/83) **08-17F Tank Outlet Valve**  
(Mfg. by Stork Amsterdam, Netherlands)  
P.O. Box 1258/Airport Parkway  
Gainesville, Georgia 30503
- 300 Superior Stainless, Inc. (11/22/77) 531 G & H Products Corp. (5/31/88)  
611 Sugar Creek Rd. 7600-57th Ave.  
Delavan, Wisconsin 53115 P.O. Box 1199  
Kenosha, Wisconsin 53141
- 357 Tanaco Products (4/16/82) **08-17G Rupture Discs**  
3860 Loomis Trail Rd. 422 BS & B Safety Systems, Inc. (6/12/84)  
Blaine, Washington 98230 7455 E. 46th St.  
73R L. C. Thomsen & Sons, Inc. (8/31/57) 407 Continental Disc Corp. (10/14/83)  
(08-17REV) 4103 Riverside NW  
(08-17A) Kansas City, Missouri 64150  
1303-43rd St.  
Kenosha, Wisconsin 53140
- 34R Tri-Clover, Inc. (10/15/56) **09-07 Instrument Fittings and Connections Used on Milk  
and Milk Products Equipment**  
(08-17REV) 428 ARi Industries, Inc. (9/12/84)  
(08-17A) 381 ARi Court  
9201 Wilmot Road Addison, Illinois 60101  
Kenosha, Wisconsin 53141 321 Anderson Instrument Co., Inc. (6/14/79)  
449 Up-Well Enterprises Co. (8/1/85) RD #1  
P.O. Box 5344 Grants Pass, Oregon 97527  
304 VNE Corporation (3/16/78) 525 Fultonville, New York 12072  
(Mfg. by Egmo, Israel) 315 Burns Engineering, Inc. (2/5/79)  
1415 Johnson St., P.O. Box 187 10201 Bren Rd., East  
Janesville, Wisconsin 53547 Minnetonka, Minnesota 55343
- 278 Valex Products Corp. (8/30/76) 206 The Foxboro Company (8/11/69)  
6080 Leland Street 33 Commercial Street  
Ventura, California 93003 Foxboro, Massachusetts 02035
- 86R Waukesha Specialty Co., Inc. (12/20/57) 418 Niro Atomizer Food & Dairy Inc. (4/2/84)  
Hwy 14 1600 County Road F  
Darien, Wisconsin 53144 Hudson, Wisconsin 54016
- 08-17A Compression Type Valves** 487 Pyromation, Incorporated (12/16/86)  
5211 Industrial Road  
Fort Wayne, Indiana 46825
- 530 G & H Products Corp. (5/31/88) 367 RdF Corporation (10/2/82)  
7600-57th Ave. 23 Elm Ave.  
P.O. Box 1199 Hudson, New Hampshire 03051  
Kenosha, Wisconsin 53141
- 480 GEA Food and Process Systems Corp. (8/8/86) 495 Rosemount Analytical Division (2/13/87)  
8940 Route 108 2400 Barranca Pkwy.  
Columbia, Maryland 21045 Irvine, California 92714
- 467 Tuchenhausen North America Inc. (1/13/86) 420 Stork Food Machinery, Inc. (4/17/84)  
(Mfg. by Otto Tuchenhausen, West Germany) P.O. Box 1258/Airport Parkway  
4119 W. Greentree Road Gainesville, Georgia 30503  
Milwaukee, Wisconsin 53209
- 08-17B Diaphragm-Type Valves** 32 Taylor Instrument (10/4/56)  
Combustion Engineering, Inc.  
400 West Avenue, P.O. Box 110  
Rochester, New York 14692
- 514 H. D. Bauman Assoc., Ltd. (8/24/87) 444 Tuchenhausen North America, Inc. (6/17/85)  
35 Mirona Road 4119 Green Tree Road  
Portsmouth, New Hampshire 03801 Milwaukee, Wisconsin 53209
- 203R ITT Grinnell Valve Co., Inc. (11/27/68) 522 Weed Instrument Company, Inc. (12/28/87)  
Dia-Flo Division 707 Jeffrey Way  
33 Centerville Rd. Round Rock, Texas 78664  
Lancaster, Pennsylvania 17603
- 494 Saunders Valve, Inc. (2/10/87) **10-03 Milk and Milk Products Filters Using Disposable  
Filter Media, as Amended**  
15760 W. Hardy, #440  
Houston, TX 77060
- 08-17D Automatic Positive Displacement Sampler** 531 Al'oy Products Corp. (12/10/82)  
284 Bristol Engineering Co. (11/18/76) 1045 Perkins Ave., P.O. Box 529  
Waukesha, Wisconsin 53187

- 435 Sermia Equipment Limited (11/27/84)  
(Not available in USA)  
2511 Barbe Avenue  
Chomedey, Laval, Quebec, Canada H7T 2A2
- 296 L. C. Thomsen, Inc. (8/25/77)  
1303 43rd St.  
Kenosha, Wisconsin 53140
- 35 Tri-Clover, Inc. (10/15/56)  
9201 Wilmot Road  
Kenosha, Wisconsin 53141

**11-04 Plate-type Heat Exchangers for Milk and Milk Products**

- 38 APV Crepaco, INC. (10/19/56)  
100 South CP Ave.  
Lake Mills, Wisconsin 53551
- 20 APV Crepaco, INC. (9/4/56)  
395 Fillmore Ave.  
Tonawanda, New York 14150
- 458 APV International Limited (10/15/85)  
(Not available in USA)  
P.O. Box 4, Manor Royal  
Crawley  
West Sussex RH10 2QB  
England
- 17 Alfa-Laval, Inc. (8/30/56)  
2115 Linwood Ave.  
Ft. Lee, New Jersey 07024
- 120 Alfa-Laval, Ltd. (12/3/59)  
(DeLaval Agric. Div.)  
11100 No. Congress Ave.  
Kansas City, Missouri 64153
- 326 American Vicarb Corporation (2/4/80)  
(Mfg. by Vicarb, France)  
89 Pearce Avenue  
Tonawanda, New York 14150
- 30 Cherry-Burrell Corp. (10/2/56)  
(A Unit of AMCA Int'l. Inc.)  
2400-6th St. SW, P.O. Box 3000  
Cedar Rapids, Iowa 52406
- 14 Chester-Jensen Co., Inc. (8/15/56)  
5th & Tilghman Sts., P.O. Box 908  
Chester, Pennsylvania 19016
- 468 GEA Food and Process Systems Corp. (2/2/86)  
8940 Route 108  
Columbia, Maryland 21045
- 15 Kusel Equipment Co. (8/15/56)  
820 West St., P.O. Box 87  
Watertown, Wisconsin 53094
- 360 Laffranchi Wholesale Co. (7/12/82)  
P.O. Box 698  
Ferndale, California 95536
- 414 Paul Mueller Co. (12/13/83)  
P.O. Box 828  
Springfield, Missouri 65801
- 491 On-Line Instrumentation, Inc. (1/2/87)  
P.O. Box 541  
Hopewell Junction, New York 12533
- 279 The Schlueter Co. (8/30/76)  
(Mfg. by Samuel Parker, New Zealand)  
112 E. Centerway  
Janesville, Wisconsin 53545
- 472 Schmidt-Bretten Inc. (5/7/86)

- 1612 Locust Avenue  
Bohemia, New York 11716
- 426 TCI-Superior Division (8/31/84)  
(Not available in USA)  
Mueller Canada Inc.  
6500 Northwest Dr.  
Mississauga, Ontario, Canada L4V 1K4

**12-05 Tubular Heat Exchangers for Milk and Milk Products**

- 438 APV Crepaco, INC. (12/10/84)  
395 Fillmore Avenue  
Tonawanda, New York 14150
- 248 Allegheny Bradford Corp. (4/16/73)  
P.O. Box 200 Route 219 South  
Bradford, Pennsylvania 16701
- 243 Babson Brothers Company (10/31/72)  
Dairy Systems Division  
1400 West Gale  
Galesville, Wisconsin 54630
- 103 Chester-Jensen Co., Inc. (6/6/58)  
5th & Tilghman Sts., P.O. Box 908  
Chester, Pennsylvania 19016
- 307 G & H Products Corp. (5/2/78)  
7600-57th Avenue  
P.O. Box 1199  
Kenosha, Wisconsin 53141
- 217 Girton Manufacturing Co. (1/31/71)  
Millville, Pennsylvania 17846
- 238 Paul Mueller Co. (6/28/72)  
P.O. Box 828  
Springfield, Missouri 65801
- 96 C. E. Rogers Co. (3/31/64)  
So. Hwy #65, P.O. Box 118  
Mora, Minnesota 55051
- 298 Sanitary Processing Equipment Corp. (1/28/85)  
P.O. Box 178, Salino Station  
Syracuse, New York 13201
- 532 Scherping Systems (6/8/88)  
801 Kingsley St.  
Winsted, Minnesota 55395
- 392 Stork Food Machinery, Inc. (6/9/83)  
(Mfg. by Stork, Netherlands)  
P.O. Box 1258/Airport Parkway  
Gainesville, Georgia 30503

**13-08 Farm Milk Cooling and Holding Tanks**

- 49R A-L Stainless Inc. (12/5/56)  
(Not available in USA)  
113 Park St., South  
Peterborough, Ontario, Canada K9J 3R8
- 240 Babson Brothers Company (9/6/72)  
Dairy Systems Division  
1400 West Gale  
Galesville, Wisconsin 54630
- 4R Dairy Equipment Co. (6/15/56)  
1919 So. Stoughton Rd.  
Madison, Wisconsin 53716
- 179R Heavy Duty Products (Preston) Ltd. (3/8/66)  
(not available in USA)  
1261 Industrial Rd.  
Cambridge (Preston)  
Ontario Canada N3H 4W3

12R	Paul Mueller Co. 1600 W. Phelps, P.O. Box 828 Springfield, Missouri 65801	(7/31/56)	324	Conoffast (Mfg. by ERCA, France) 1600 Harvester Road West Chicago, Illinois 60185	(11/29/79)
<b>16-05 Evaporators and Vacuum Pans for Milk and Milk Products</b>					
254	AVP Anhydro, Inc. (Mfg. by Anhydro, Denmark) 165 John L. Dietsch Square Attleboro Falls, Massachusetts 02763	(1/7/74)	488	Holmatic Inc. 6691 Jimmy Carter Blvd. Norcross, Georgia 30071	(12/22/86)
132	APV Crepaco, INC. 395 Fillmore Ave. Tonawanda, New York 14150	(10/26/60)	473	International Paper Company Extended Shelf Life Division 4020 Stirrup Creed Drive Bldg. 200 P.O. Box 13318 Research Triangle Park, North Carolina 27709	(6/12/86)
277	Alfa-Laval, Inc. Contherm Division P.O. Box 352, 111 Parker St. Newburyport, Massachusetts 01950	(8/19/76)	452	Jagenberg Inc. Freshwater Blvd. P.O. Box 188 Enfield, Connecticut	(9/3/85)
500	Dedert Corporation 20000 Governors Drive Olympia Fields, Illinois 60461	(4/9/87)	516	Leifeld + Lemke USA (Mfg. by Leifeld + Lemke, West Germany) 25 Whitney Road Mahwah, New Jersey 07430	(9/18/87)
311	GEA Food and Process Systems Corp. (Mfg. by Gebruder, West Germany) 8940 Route 108 Columbia, Maryland 21045	(8/28/79)	220	Liquipak International, Inc. 2285 University Ave. St. Paul, Minnesota 55114	(4/24/71)
273	Niro Atomizer Food & Dairy, Inc. 1600 County Rd F Hudson, Wisconsin 54016	(5/20/76)	330	Milliken Packaging (Mfg. by Chubukkikai, Japan) White Stone, South Carolina 29353	(8/26/80)
107R	C. E. Rogers Co. So. Hwy #65, P.O. Box 118 Mora, Minnesota 55051	(7/31/58)	442	Milliken Packaging White Stone, South Carolina 29386	(2/21/85)
299	Stork Food Machinery, Inc. (Mfg. by Stork, Holland) P.O. Box 1258/Airport Parkway Gainesville, Georgia 30503	(11/17/77)	137	Pure-Pak, Inc. 850 Ladd Road Walled Lake, Michigan 48088	(10/17/62)
427	TCI-Superior Division (Not available in USA) Mueller Canada Inc. 6500 Northwest Dr. Mississauga, Ontario, Canada L4V 1K4	(8/31/84)	281	Purity Packaging Corp. 800 Kaderly Dr. Columbus, Ohio 43228	(11/8/76)
387	Unitech Div. of the Graver Co. 2720 Hwy. 22 Union, New Jersey 07083	(5/13/83)	511	E. P. Remy (Mfg. by E. P. Remy, France) 2096 Gaither Road Rockville, Maryland 20850	(8/14/87)
186R	Marriott Walker Corp. 925 E. Maple Rd. Birmingham, Michigan 48011	(9/6/66)	482	Serac Inc. 1209 Capitol Drive Addison, Illinois	(8/25/86)
<b>17-06 Fillers and Sealers of Single Service Containers for Milk and Milk Products</b>					
366	Autoprod, Inc. 12 So. Denton Ave. New Hyde Park, New York 11040	(9/15/82)	521	Twinpak, Inc. (Canada) (Not available in USA) 2225 Hymus Dorval, Quebec, Canada H9P 1J8	(2/4/70)
346	B-Bar-B, Inc. E. 10th & McBeth, P.O. Box 909 New Albany, New York 47150	(10/21/81)	<b>19-03 Batch and Continuous Freezers for Ice Cream, Ices, and Similarly Frozen Dairy Foods, as Amended</b>		
192	Cherry-Burrell Corp. (A Unit of AMCA Int'l, Inc.) 2400-6th St. SW, P.O. Box 3000 Cedar Rapids, Iowa 52406	(1/3/67)	141	APV Crepaco, INC. 100 South CP Ave. Lake Mills, Wisconsin 53551	(4/15/63)
382	Combibloc, Inc. (Mfg. by Jagenberg, West Germany) 4800 Roberts Rd. Columbus, Ohio 43228	(4/15/83)	146	Cherry-Burrell Corp. (A Unit of AMCA Int'l, Inc.) 2400-6th St. SW, P.O. Box 3000 Cedar Rapids, Iowa 52406	(12/10/63)

- 286 O. G. Hoyer, Inc. (12/8/76)  
(Mfg. by Alfa Hoyer, Denmark)  
201 Broad St.  
Lake Geneva, Wisconsin 53147
- 401 Coldelite Corp. of America (8/22/82)  
Robinson Rd. & Rt. 17 So.  
Lodi, New Jersey 07644-3897
- 465 Leon's Frozen Custard (12/17/85)  
3131 S. 27th Street  
Milwaukee, Wisconsin 53151
- 412 Sani Mark, Inc. (11/28/83)  
2020 Production Drive  
Indianapolis, Indiana 46241
- 355 Emery Thompson Machine & Supply Co. (3/9/82)  
1349 Inwood Ave.  
Bronx, New York 10452

**22-04 Silo-type Storage Tanks for Milk and Milk Products**

- 262 A-L Stainless Inc. (11/11/74)  
(Not available in USA)  
113 Park St., South  
Peterborough, Ontario, Canada K9J 3R8
- 154 APV Crepaco, Inc. (2/10/65)  
100 South CP Ave.  
Lake Mills, Wisconsin 53551
- 168 Cherry-Burrell Corp. (6/16/65)  
(A Unit of AMCA Int'l, Inc.)  
575 E. Mill Street  
Little Falls, New York 13365
- 160 DCI, Inc. (4/5/65)  
P.O. Box 1227, 600 No. 54th Ave  
St. Cloud, Minnesota 56301
- 181 Damrow Co. (5/18/66)  
(Div. of DEC Int'l., Inc.)  
196 Western Ave., P.O. Box 750  
Fond du Lac, Wisconsin 54935-0750
- 439 JV Northwest Inc. (1/22/85)  
28120 SW Boberg Rd.  
Wilsonville, Oregon 97070
- 155 Paul Mueller Co. (2/10/65)  
1600 W. Phelps, P.O. Box 828  
Springfield, Missouri 65801
- 460 Niro Atomizer Food & Dairy Inc. (11/4/85)  
1600 County Road F  
Hudson, Wisconsin 54016
- 503 Ripley Stainless Ltd. (5/1/87)  
(Not available in USA)  
RR #3, Site 41  
Summerland, British Columbia V0H 1Z0
- 312 Sanitary Processing Equipment Corp. (9/15/78)  
P.O. Box 178, Salino Station  
Syracuse, New York 13201
- 479 Scherping Systems (8/3/86)  
801 Kingsley Street  
Winsted, Minnesota 55395
- 434 TCI-Superior Division (11/9/84)  
(Not available in USA)  
Mueller Canada Inc.  
6500 Northwest Dr.  
Mississauga, Ontario, Canada L4V 1K4
- 165 Walker Stainless Equipment Co., Inc. (4/26/65)  
Elroy, Wisconsin 53929

**23-01 Equipment for Packaging Frozen Desserts, Cottage Cheese, and Similar Milk Products, as Amended**

- 174 APV Anderson Bros. Mfg. Co. (9/28/65)  
1303 Samuelson Rd.  
Rockford, Illinois 61109
- 209 Dobby Packaging Machinery Incorp. (7/23/69)  
869 S. Knowles Ave.  
New Richmond, Wisconsin 54017
- 499 Holmatic Inc. (3/19/87)  
6691 Jimmy Carter Blvd.  
Norcross, Georgia 30071
- 343 O. G. Hoyer, Inc. (7/6/81)  
(Mfg. by Alfa Hoyer, Denmark)  
201 Broad St.  
Lake Geneva, Wisconsin 53147
- 447 Mateer-Burt Co., Inc. (7/22/85)  
(Mfg. by Trustpak, England)  
436 Devon Park Drive  
Wayne, Pennsylvania 19087
- 222 Sweetheart Packaging Corporation (11/15/71)  
Maryland Cup Corporation  
10100 Registerstown Road  
Owings Mills, Maryland 21117

**24-01 Non-coil Type Batch Pasteurizers**

- 158 APV Crepaco, INC. (3/24/65)  
100 South CP Ave.  
Lake Mills, Wisconsin 53551
- 161 Cherry-Burrell Corp. (4/5/65)  
(A Unit of AMCA Int'l., Inc.)  
575 E. Mill St.  
Little Falls, New York 13365
- 402 Coldelite Corp. of America (8/22/83)  
Robinson Rd. & Rt. 17 So.  
Lodi, New Jersey 07644-3897
- 187 DCI, Inc. (9/26/66)  
P.O. Box 1227, 600 No. 54th Ave.  
St. Cloud, Minnesota 56301
- 166 Paul Mueller Co. (4/26/65)  
P.O. Box 828  
Springfield, Missouri 65801
- 519 Sanitary Processing Equip. Corp. (10/22/87)  
2611 Lodi Street  
Syracuse, New York 13208

**25-01 Non-coil Type Batch Processors for Milk and Milk Products**

- 159 APV Crepaco, INC. (3/24/65)  
100 South CP Ave.  
Lake Mills, Wisconsin 53551
- 162 Cherry-Burrell Corp. (4/5/65)  
(A Unit of AMCA Int'l., Inc.)  
575 E. Mill St.  
Little Falls, New York 13365
- 188 DCI, Inc. (9/26/66)  
P.O. Box 1227, 600 No. 54th Ave.  
St. Cloud, Minnesota 56301
- 167 Paul Mueller Co. (4/26/65)  
P.O. Box 828  
Springfield, Missouri 65801



- 448 Scherping Systems (8/1/85) Statesboro, Georgia 30458  
801 Kingsley Street  
Winsted, Minnesota 55395
- 520 Stainless Fabrication, Inc. (12/8/87) 469 Endress + Hauser, Inc. (3/3/86)  
633 N. Prince Lane  
Springfield, Missouri 65802  
226 Fischer & Porter Co. (12/9/71)  
County Line Rd.  
Warminster, Pennsylvania 18974
- 202 Walker Stainless Equipment Co. (9/24/68) 477 Flowdata Inc. (7/31/86)  
New Lisbon, Wisconsin 53950  
15510 Wright Bros. Drive  
Dallas, Texas 75244-2137
- 26-02 Sifters for Dry Milk and Dry Milk Products**
- 173 Blaw-Knox Food & Chemical Equip. Co. (9/20/65) 506 Flow Technology, Inc. (6/17/87)  
P.O. Box 1041  
Buffalo, New York 14240  
4250 East Broadway Road  
Phoenix, Arizona 85040
- 363 Kason Corp. (7/28/82) 224 The Foxboro Company (11/16/71)  
1301 East Linden Ave.  
Linden, New Jersey 07036  
33 Commercial Street  
Foxboro, Massachusetts 02035
- 430 Midwestern Industries, Inc. (10/11/84) 475 Hackman-MKT, Inc. (7/15/86)  
915 Oberlin Rd., P.O. Box 810  
Massillon, Ohio 44648-0810  
100 Pinnacle Way, Suite 165  
Norcross, Georgia 30071
- 185 Rotex, Inc. (8/10/66) 512 Hoffer Flow Controls, Inc. (8/17/87)  
1230 Knowlton St.  
Cincinnati, Ohio 45223  
149 Highway 26  
Port Monmouth, New Jersey 07758
- 172 SWECO, INC. (9/1/65) 474 Hydril Production (6/30/86)  
8029 U.S. Hwy. 25  
Florence, New York 41042  
Technology Division  
3300 North Belt East  
P.O. Box 60458  
Houston, Texas 77205-0458
- 176 Sprout-Waldron, Koppers Co., Inc. (1/4/66) 399 E. Johnson Engineering & Sales (8/3/83)  
Muncy, Pennsylvania 17756  
11 N. Grant St.  
Hinsdale, Illinois 60521
- 27-01 Equipment for Packaging Dry Milk and Dry Milk Products**
- 353 All-Fill, Inc. (3/2/82) 529 KROHNE America, Inc. (5/18/88)  
40 Great Valley Pkwy.  
Malvern, Pennsylvania 19355  
(Mfg. by Altometer, Holland)  
One Intercontinental Way  
Peabody, Massachusetts 01960
- 409 Mateer-Burt Co. (10/31/83) 320 Max Machinery, Inc. (3/28/79)  
436 Devon Park Dr.  
Wayne, Pennsylvania 19087  
1420 Healdsburg Ave.  
Healdsburg, California 95448
- 476 Stone Container Corporation (7/17/86) 378 Micro Motion, Inc. (2/16/83)  
1881 West North Temple  
Salt Lake City, Utah 84116-2097  
7070 Winchester Circle  
Boulder, Colorado 80301
- 497 Triangel Package Machinery Co. (2/26/87) 490 Rosemount Inc. (1/8/87)  
6655 West Diversey Ave.  
Chicago, Illinois 60635  
12001 West 78th Street  
Eden Prairie, Minnesota 55344
- 28-00 Flow Meters for Milk and Liquid Milk Products**
- 272 Accurate Metering Systems, Inc. (4/2/76) 493 Sarasota Automation Inc. (2/2/87)  
(Mfg. by Diessel GmbH, Germany)  
1651 Wilkening Court  
Schaumburg, Illinois 60173  
1500 N. Washington Blvd.  
Sarasota, Florida 33577
- 253 Badger Meter, Inc. (1/2/74) 270 Taylor Instrument (2/9/76)  
4545 W. Brown Deer Rd.  
P.O. Box 23099  
Milwaukee, Wisconsin 53223  
Combustion Engineering, Inc.  
400 West Avenue, P.O. Box 110  
Rochester, New York 14692
- 518 Bailey Controls Company (10/16/87) 386 Turbo Instruments, Inc. (5/11/83)  
29801 Euclid Avenue  
Wickliffe, Ohio 44092  
(Mfg. by Turowerk, West Germany)  
4 Vashell Way  
Orinda, California 94563
- 265 Electronic Flo-Meters, Inc. (3/10/75) **29-00 Air Eliminators for Milk and Fluid Milk Products**
- 359 Emerson Elec. Co. (6/11/82) 340 Accurate Metering Systems, Inc. (6/2/81)  
Brooks Instrument Div.  
P.O. Box 450, North 301  
(Mfg. by Diessel GmbH, Germany)  
1651 Wilkening Court  
Schaumburg, Illinois 60173
- 485 Hackman-MKT, Inc. (11/18/86)  
100 Pinnacle Way, Suite 165  
Norcross, GA 30071

- 436 Scherping Systems (11/27/84)  
801 Kingsley Street  
Winsted, Minnesota 55395
- 30-01 Farm Milk Storage Tanks**
- 421 Paul Mueller Co. (4/17/84)  
P.O. Box 828  
Springfield, Missouri 65801
- 31-01 Scraped Surface Heat Exchangers, as Amended**
- 290 APV Crepaco, INC (6/15/77)  
100 South CP Ave.  
Lake Mills, Wisconsin 53551
- 274 Alfa-Laval, Inc. (6/25/76)  
Contherm Div.  
P.O. Box 352, 111 Parker St.  
Newburyport, Massachusetts 01950
- 361 BFM Machinery Corp. (7/12/82)  
(Mfg. by M. V. Machinfabriek, Netherlands)  
P.O. Box 117  
Fall River, Wisconsin 53932
- 323 Cherry-Burrell Corp. (7/26/79)  
(A Unit of AMCA Int'l., Inc.)  
2400-6th St., SW, P.O. Box 3000  
Cedar Rapids, Iowa 52406
- 496 FranRica Mfg. Corp. (2/23/87)  
2807 South Highway 99  
Stockton, California 95202
- 32-00 Uninsulated Tanks for Milk and Milk Products**
- 397 APV Crepaco, INC. (6/21/83)  
100 South CP Ave.  
Lake Mills, Wisconsin 53551
- 264 Cherry-Burrell Corp. (1/27/75)  
(A Unit of AMCA Int'l., Inc.)  
575 E. Mill St.  
Little Falls, New York 13365
- 268 DCI, Inc. (11/21/75)  
600 No. 54th Ave., P.O. Box 1227  
St. Cloud, Minnesota 56301
- 354 C. E. Rogers Co. (3/3/82)  
S. Hwy #65, P.O. Box 118  
Mora, Minnesota 55051
- 441 Scherping Systems (3/1/85)  
801 Kingsley St.  
Winsted, Minnesota 55395
- 433 TCI-Superior Division (11/9/84)  
(Not available in USA)  
Mueller Canada Inc.  
6500 Northwest Dr.  
Mississauga, Ontario, Canada L4V 1K4
- 339 Walker Stainless Equipment Co., Inc. (6/2/81)  
601 State St.  
New Lisbon, Wisconsin 53950
- 33-00 Polished Metal Tubing for Dairy Products**
- 310 Allegheny Bradford Corp. (7/19/78)  
P.O. Box 200 Route 219 South  
Bradford, Pennsylvania 16701
- 413 Azco, Inc. (12/8/83)
- P.O. Box 567  
Appleton, Wisconsin 54912
- 308 Rath Manufacturing Co., Inc. (6/20/78)  
2505 Foster Ave.  
Janesville, Wisconsin 53545
- 368 Gordon J. Rodger & Sons Ltd. (10/7/82)  
P.O. Box 186  
Blenheim, Ontario Canada N0P 1A0
- 335 Stainless Products, Inc. (12/18/80)  
1649-72nd Ave., Box 169  
Somers, Wisconsin 53171
- 289 Tri-Clover, Inc. (1/21/77)  
9201 Wilmot Road  
Kenosha, Wisconsin 53141
- 331 United Industries, Inc. (10/23/80)  
1546 Henry Ave.  
Beloit, Wisconsin 53511
- 35-00 Continuous Blenders**
- 527 Arde Barinco, Inc. (3/15/88)  
500 Walnut Street  
Norwood, New Jersey 07648
- 417 Cherry-Burrell (2/7/84)  
Anco/Votator Division  
P.O. Box 35600  
Louisville, Kentucky 40232
- 464 Dairy Service Mfg., Inc. (12/12/85)  
4630 W. Florissant Ave.  
St. Louis, Missouri 63115
- 415 Luwa Corporation (1/5/84)  
P.O. Box 16348  
Charlotte, North Carolina 28297-6348
- 526 Schugi Process Engineers (3/15/88)  
(Mfg. by Lelystad, The Netherlands)  
41 Tamarack Circle  
Skillman, New Jersey 08558
- 36-00 Colloid Mills**
- 293 Waukesha Div., Abex Corp. (8/25/77)  
1300 Lincoln Ave.  
Waukesha, Wisconsin 53186
- 37-00 Pressure and Level Sensing Devices**
- 318 Anderson Instrument Co., Inc. (4/9/79)  
R.D. #1  
Fultonville, New York 12072
- 481 Control Systems Design, Inc. (8/14/86)  
P.O. Box 1689  
Manchester, Missouri 63011
- 405 Drexelbrook Engineering Co. (9/27/83)  
205 Keith Valley Rd.  
Horsham, Pennsylvania 19044
- 423 Dynisco (6/15/84)  
Ten Oceana Way  
Norwood, Massachusetts 02062
- 459 Endress + Hauser, Inc. (10/17/85)  
2350 Endress Place  
Greenwood, Indiana 46142
- 524 Flow Technology, Inc. (1/14/88)  
4250 E. Broadway Road  
Phoenix, Arizona 85040

463	The Foxboro Company 33 Commercial Street Foxboro, Massachusetts 02035	(12/6/85)	410	Viatran Corporation 300 Industrial Drive Grand Island, New York 14072	(11/1/83)
396	King Engineering Corp. P.O. Box 1228 Ann Arbor, Michigan 48106	(6/13/83)	525	Zantel Instrument 12925 Alcosta Blvd., #8 San Ramon, California 94583	(3/4/88)
501	Lumenite Electronic Company 2331 N. 17th Avenue Franklin Park, Illinois 60131	(4/27/87)	<b>38-00 Cottage Cheese Vats (In Press)</b>		
419	Niro Atomizer Food & Dairy Inc. 1600 County Road F Hudson, Wisconsin 54016	(4/2/84)	385	Stoelting, Inc. P.O. Box 127 Kiel, Wisconsin 53042-0127	(5/5/83)
523	Paper Machine Components, Inc. Miry Brook Road Danbury, Connecticut 06810	(1/3/88)	<b>40-01 Bag Collectors for Dry Milk and Dry Milk Products</b>		
328	Rosemount, Inc. 12001 W. 78th St. Eden Prairie, Wisconsin 55344	(5/22/80)	406	Chicago Conveyor Corporation 330 LaLonde Avenue Addison, Illinois 60101	(10/5/83)
515	Setra Systems, Inc. 45 Nagag Park Acton, Massachusetts 01720	(9/14/87)	504	General Resource Corporation 201 3rd Street South Hopkins, Minnesota 55343	(5/15/87)
498	Statham Division of Solartron Transducers 2230 Stratham Blvd. Oxnard, California 93033	(3/5/87)	381	Marriott Walker Corp. 925 E. Maple Rd. Birmingham, Michigan 48011	(4/12/83)
285	Tank Mate Div/Monitor Mfg. Co. P.O. Box AL Elburn, Illinois 60119	(12/7/76)	453	MikroPul Corporation 10 Chatham Road Summit, New Jersey 07901	(9/4/85)
317	Taylor Instrument Combustion Engineering, Inc. 400 West Avenue Rochester, New York 14692	(2/26/79)	456	C. E. Rogers Company P.O. Box 118 Mora, Minnesota 55051	(9/25/85)

# 3-A Sanitary Standards for Fittings Used On Milk and Milk Products Equipment and Used On Sanitary Lines Conducting Milk and Milk Products

Number 08-17 I Rev.  
[Steam Injection Heaters]

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. Sanitary steam injection heater specifications heretofore or hereafter developed which so differ in design, material, and fabrication, or otherwise as not to conform with the following standards but which, in the manufacturer's or fabricator's opinion are equivalent or better may be submitted for the joint consideration of IAMFES, USPHS, and DIC at any time.

## A

### SCOPE

#### A.1

These standards cover the sanitary aspects of steam injection heaters used to heat milk or milk products when the heater is on processing equipment or in the lines conveying milk or milk products.

#### A.2

In order to conform with these 3-A Sanitary Standards, steam injection heaters shall comply with the following in design, material and fabrication criteria.

## B

### DEFINITIONS

#### B.1

*Product:* Shall mean milk and milk products.

#### B.2

*Surfaces:*

##### B.2.1

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

##### B.2.2

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

#### B.3

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

## C

### MATERIALS

#### C.1

Product contact surfaces shall be of stainless steel of the AISI 300 series<sup>(1)</sup> or corresponding ACI<sup>(2)</sup> types (see Appendix, Section F) or metal which is equal in cleanliness to stainless steel of the foregoing types, and which

under conditions of intended use is equally corrosion-resistant, non-toxic and non-absorbent, except that:

#### C.1.1

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

#### C.1.2

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

#### C.1.3

Plastic materials may be used for gaskets, valve plugs, valve body liners, nozzles, O-Rings, seals and parts having the same functional purposes.

#### C.1.4

Plastic materials when used for the above specified applications shall comply with the applicable provisions of the 3-A Sanitary Standards for Multiple-Use Plastic Materials, Number 20-13 as amended.

#### C.1.5

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.1.6

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

#### C.1.7

In a processing system to be sterilized by heat and operated at a temperature of 250-degrees F (121.11-degrees C) or higher, all materials having a product contact surface(s) used in the construction of steam injection heaters and non-metallic component parts shall be such that they can be (1) sterilized by saturated steam or water under pressure at a temperature of at least 250-degrees F (121.11-degrees C) and (2) operated at the temperature required for processing.

#### C.2

Non-product contact surfaces shall be of corrosion-resis-

<sup>(1)</sup> The data for this series are contained in the following references: *AISI Steel Products Manual, Stainless and Heat Resisting Steels, December 1974, Table 2-1, pp. 18-19.* Available from: American Iron & Steel Institute, 1000 16th St., NW, Washington, DC 20036.

<sup>(2)</sup> Steel Founders' Society of America, *Cast Metal Federation Bldg., 455 State St., Des Plaines, IL 60016.*

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

## D

### FABRICATION

#### D.1

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

#### D.2

Steam injection heaters that are to be mechanically cleaned shall be designed so that the product contact surfaces of the steam injection heater, and all non-removable appurtenances thereto can be mechanically cleaned and are accessible for inspection.

#### D.3

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

#### D.4

Product contact surfaces shall be self-draining when properly installed.

#### D.5

Internal angles on product contact surfaces shall have minimum radii of 1/16-inch, except that:

##### D.5.1

The minimum radii in gasket grooves or gasket retaining grooves other than those for standard 1/4-inch and smaller O-Rings shall be not less than 1/8-inch.

##### D.5.2

The minimum radii in grooves for standard 1/4-inch O-Rings shall be not less than 3/32-inch and for standard 1/8-inch O-Rings shall be not less than 1/32-inch.

#### D.6

Coil springs having product contact surfaces shall have at least 3/32-inch openings between coils including the ends when the spring is in a free position.

#### D.7

There shall be no threads in contact with the product.

#### D.8

##### *Non-Product Contact Surfaces:*

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

## E

### SPECIAL CONSIDERATIONS

#### E.1

In a processing system to be sterilized by heat and

operated at a temperature of 250-degrees F (121.11-degrees C) or higher, steam injection heaters and non-metallic component parts shall comply with the applicable provisions of this standard and the following:

#### E.1.1

The construction shall be such that they can be (1) sterilized by saturated steam or water under pressure at a temperature of 250-degrees F (121.11-degrees C) and (2) operate at the temperature required for processing.

## APPENDIX

## F

### STAINLESS STEEL MATERIALS

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

## G

### 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 D.1 herein.

## H

### STEAM FOR PRODUCT CONTACT

The method of producing steam of culinary quality for steam injection heaters will be found in the 3-A Accepted Practice for Culinary Steam, Number 609-00.

These standards shall become effective September 25, 1988.

<sup>3)</sup> Available from ASTM, 1916 Race St., Philadelphia, PA 19103.

# 3-A Sanitary Standards For Flow Meters For Milk and Milk Products

Number 28-01

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. Flow meter specifications heretofore and hereafter developed which so differ in design, material, fabrication, or otherwise as not to conform with the following standards, but which, in the fabricator's opinion are equivalent or better, may be submitted for the joint consideration of the IAMFES, USPHS, and DIC at any time.

## A

### SCOPE

#### A.1

These standards cover the sanitary aspects of flow meters for milk and milk products and include that portion of any device integral with the meter such as strainers, temperature sensors and density sensors, which is in contact with the flowing product. It does not pertain to meters designed to measure the milk from an individual milking animal.

#### A.2

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

## B

### DEFINITIONS

#### B.1

*Flow Meter:* Shall mean a device to measure the flow of milk and milk products.

#### B.2

*Product:* Shall mean milk and milk products.

#### B.3

### Surfaces

#### B.3.1

*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.3.2

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

#### B.4

*Engineering Plating:* Shall mean plated to specific dimensions or processed to specified dimensions after plating.<sup>\*1</sup>

<sup>\*1</sup> QQ-C-320b Federal Specification for Chromium Plating (Electrodeposited), June 7, 1985. Available from the General Services Administration, 18th and F Sts., NW, WFCIA, Washington, DC 20405.

QQ-N-290a Federal Specification for Nickel Plating (Electrodeposited) November 12, 1971. Available from General Services Administration, 18th and F Sts., NW, WFCIA, Washington, DC 20405.

<sup>\*2</sup> The data for this series are contained in the following references: AISI Steel Products Manual, Stainless & Heat Resisting Steels, December, 1974, Table 2-1, pp. 18-19. Available from: American Iron & Steel Institute, 1000 16th St., NW, Washington, DC 20036.

<sup>\*3</sup> Steel Founders' Society of America, Cast Metals Federation Bldg., 455 State St., Des Plaines, IL 60016.

## B.5

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

## C

### MATERIALS

#### C.1

Product contact surfaces shall be of stainless steel of the AISI 300 series<sup>\*2</sup> or corresponding ACT<sup>\*3</sup> types (See Appendix, Section E), or metal which under conditions of intended use is at least as corrosion-resistant as stainless steel of the foregoing types, and that is non-toxic and non-absorbent, except that:

#### C.1.1

Rotors of turbine-type meters may also be made of non-toxic, corrosion-resistant stainless metal (400 series stainless steel, or equivalent) or these materials covered with an engineering plating of nickel or chromium.

#### C.1.2

Shafts and sleeve bearings may also be made of non-toxic, corrosion-resistant tungsten carbide.

#### C.1.3

Rubber and rubber-like materials may be used for gaskets, seals, meter bodies, meter body liners, magnet carriers, meter valve members, coatings, rotors, pistons, bearings, shafts, and parts having the same functional purposes.

#### C.1.4

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

#### C.1.5

Plastic materials may be used for gaskets, seals, meter bodies, meter body liners, magnet carriers, meter valve members, coatings, rotors, pistons, bearings, shafts, and parts having the same functional purposes.

#### C.1.6

Plastic materials when used for the above specified applications shall comply with the applicable provisions of the 3-A Sanitary Standards for Multiple-Use Plastic Materials, as amended, Number 20-13.

### C.1.7

Rubber and rubber-like materials and 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.1.8

Pistons and rotors may also be made of hard rubber (a vulcanized rubber having a ratio of combined sulfur to rubber hydrocarbon in excess of 15% and a Shore A Durometer value in excess of 90) that is non-toxic and relatively resistant to abrasion, will maintain its original characteristics such as form, shape and dimensions and will not affect the product and shall when subjected to the test regimen set forth in the 3-A Sanitary Standards for Multiple-Use Plastic Materials, as amended, Number 20-13, (a) comply with the criteria in Section I (1) and Section I (3), (b) have maximum weight gains as set forth in Section I (2) of 0.30 in the Cleanability Response, and 0.30 in Product Treatment with Solution I and 0.30 in Product Treatment with Solution J.

### C.1.9

Where materials having certain inherent functional purposes are required for specific applications, such as pistons, shafts, bearings, and rotary seals, carbon<sup>4</sup>, and/or ceramic materials may be used. Carbon and/or ceramic materials shall be inert, non-porous, non-toxic, non-absorbent, insoluble, resistant to scratching, scoring, and distortion when exposed to the conditions encountered in the environment of intended use and in cleaning and bactericidal treatment.

### C.1.10

The final bond and residual adhesive, if used, of bonded carbon and/or ceramic materials shall be non-toxic.

### C.2

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

### D

#### FABRICATION

### D.1

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

### D.2

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

### D.3

The minimum thickness of engineering plating shall be 0.0002-inch for all product contact parts except that when the parts that are to be plated are other than stainless steel, the minimum thickness of the engineering plating shall be 0.002-inch.

### D.4

Meters that are to be mechanically cleaned shall be designed so that all product contact surfaces of the meter and all non-removable appurtenances thereto can be mechanically cleaned and are accessible for inspection.

### D.5

Product contact surfaces of meters 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.6

All product contact surfaces to be mechanically cleaned shall be self-draining except for normal clingage.

### D.6.1

Product contact surfaces which are not self-draining shall be constructed so that they can be readily and easily opened and drained without complete disassembly.

### D.7

Threaded, clamped or flange type connections shall conform to the applicable provisions of the 3-A Sanitary Standards for Fittings, as amended, Parts I and II (Rev.), Number 08-17.

### D.8

Tubing to be used in meters shall conform to the applicable provisions of the 3-A Sanitary Standards for Polished Metal Tubing, Number 33-00.

### D.9

All internal angles of 135-degrees or less on product contact surfaces shall have minimum radii of 1/4-inch, except:

### D.9.1

Where for space or functional reasons it is impossible to have a radius of 1/4-inch. When for functional reasons the radius must be less than 1/32-inch, in such applications as flat sealing surfaces, the product contact surface of this internal angle must be readily accessible for cleaning and inspection.

### D.9.2

The minimum radii in gasket grooves or gasket retaining grooves other than those for standard 1/4-inch and smaller O-Rings shall not be less than 1/8-inch.

### D.9.3

The minimum radii in grooves for standard 1/4-inch O-Rings shall be not less than 3/32-inch and for standard 1/

<sup>4</sup>Carbon which is specifically in compliance with the Food, Drug and Cosmetic Act, as amended, is that which is included in "V Fillers" in the food additive regulations for rubber articles intended for repeated use, 177.2600 of Subpart F, Code of Federal Regulations, Title 21--Food and Drugs.

8-inch O-rings shall not be less than 1/32 inch.

D.10

Gaskets shall be removable.

D.11

There shall be no threads on product contact surfaces.

D.12

*Flow Meter Supports*

The means of supporting flow meters shall be one of the following:

D.12.1

*With legs:* Legs shall be adjustable, smooth with rounded ends, and have no exposed threads. Legs made of hollow stock shall be sealed. Legs shall be of sufficient length to provide a clearance between the lowest part of the base, flow meter, and floor of no less than:

D.12.1.1

Four-inches on meters with legs designed to be fixed to the floor or flow meters having a horizontal base area of more than one square foot.

D.12.1.2

Two-inches on flow meters having a horizontal base area of not more than one square foot and not designed to be fixed to the floor.

D.12.2

*Mounted on a slab or island:* The base of the flow meter shall be such that it may be sealed to the mounting surface. (See Appendix, Section G.)

D.12.3

*Mounted on a wall or column:* If the flow meter is to be sealed to a wall or column, the base shall be such that it may be sealed to the mounting surface.

D.13

Non-product contact shall be readily cleanable and shall be free of pockets and crevices except those created on the face of a register at the window, ticket slots, pick-off coils, auto stop buttons, reset handles, totalizer holes, and similar places.

D.14

Non-product contact surfaces to be coated shall be effectively prepared for coating.

APPENDIX

E

*STAINLESS STEEL MATERIALS*

Stainless steel conforming to the applicable composition ranges established by AISI<sup>2</sup> for wrought products, or by ACI<sup>3</sup> for cast products, should be considered in compliance with the requirements of Section C.1 herein.

Where welding is involved the carbon content of the stainless steel should not exceed 0.08%. The first reference cited in C.1 sets forth the chemical ranges and limits of acceptable stainless steels of the 300 series. Cast grades of stainless steel corresponding to types 303, 304, and 316 are designated CF-16F, CF-8, and CF-8M, respectively.

These cast grades are covered by ASTM<sup>5</sup> specifications A351/A351M, A743/A743M, AND A744/A744M.

F

*PRODUCT CONTACT SURFACE FINISH*

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

G

*SLABS OR ISLANDS*

When a flow meter is designed to be installed on a slab or an island, the dimensions of the slab or an island should be such that the flow meter base will extend beyond the slab or island at least one-inch in all horizontal directions. The slab or island should be of sufficient height so that the top of the flow meter base is not less than four-inches above the floor. The surface of the slab or island should be coated with a thick layer of waterproof mastic material, which will harden without cracking. The junction of the flow meter base and upper edges of the slab or island should be sealed.

These standards shall become effective September 25, 1988.

<sup>5</sup>) Available from ASTM, 1916 Race St., Philadelphia, PA 19103.



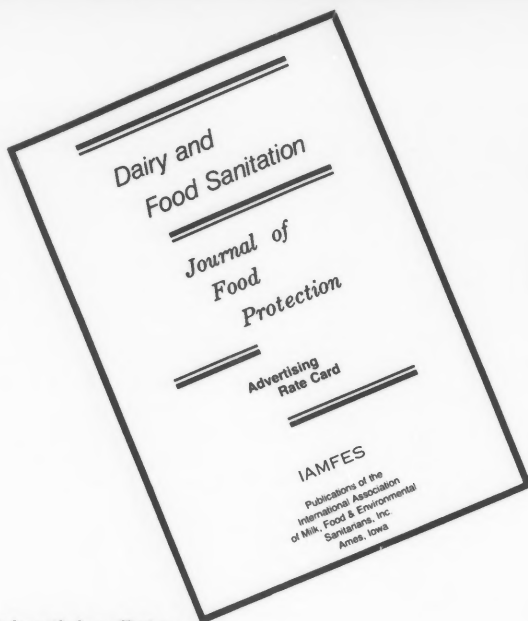
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**A Collaborative Study Comparing Three ELISA Systems for Detecting *Staphylococcus aureus* Enterotoxin A in Sausage Extracts**, H. Schönwälder, J. J. Haaijman, R. Holbrook, J. Huis in't, Veld, S. Notermans, I. M. Schäffers and R. Zschaler, Unilever Research Laboratorium Vlaardingen, P.O. Box, 3130 AC Vlaardingen, The Netherlands

*J. Food Prot.* 51:680-684

Three ELISA's for the detection of staphylococcal enterotoxin A (SEA) were evaluated by a collaborative test in five laboratories for possible use in quality control laboratories. Two ELISA's gave quantitative results using polyclonal antibodies (PCA) or monoclonal antibodies (MCA); the third was the commercially available qualitative FEY ELISA test using PCA. Test samples comprised ripened and unripened sausage alone or spiked with 10 µg or 1 µg SEA/100 g, the latter representing a minimum emetic dose. The quantitative MCA ELISA gave more reliable and sensitive results with lower non-specific background responses, lower standard deviations and coefficients of variation than the PCA ELISA; however, the recovery of enterotoxin concentrations from extracts was lower, which was more distinct in unripened than in ripened sausage. The MCA ELISA gave lower values of absolute response but more reliable results for extracts from sausage spiked with 1 µg SEA/100 g. The FEY ELISA gave sufficient reliable results in our experiments with sausage extracts and looks adequate for controlling suspicious raw materials and food products.

**A Comparison of Six Selective Media for the Enumeration and Isolation of Staphylococci**, D. G. White, J. S. Matos, R. J. Harmon and B. E. Langlois, Department of Animal Sciences, University of Kentucky, Lexington, Kentucky 40546-0215

*J. Food Prot.* 51:685-690

The efficacy of Baird-Parker agar, Baird-Parker agar with bacitracin (0.8 µg/ml), Baird-Parker agar supplemented with acriflavin (7 µg/ml), polymyxin (20 units/ml) and sulpho- namides (55 µg/ml), KRANEP agar, mannitol salt agar, and *Staphylococcus* medium 110 agar for the isolation and enumeration of *Staphylococcus* species was investigated. Bovine blood agar was used as the control medium. Thirty-seven staphylococci strains representing 23 species and 19 non-*Staphylococcus* species were tested. None of the six selective media supported the growth of all 37 *Staphylococcus* strains. The number of

*Staphylococcus* species that grew on a specific medium ranged from only the *S. aureus* strains on Baird-Parker agar supplemented with acriflavin, polymyxin, and sulphonamides, to all but *S. warneri* BG 647 on *Staphylococcus* medium 110 agar. Strains of *Bacillus*, *Corynebacterium*, and *Micrococcus* grew on all six selective media.

**Distribution of *Trichinella spiralis* in the Diaphragm of Experimentally Infected Swine**, A. W. Kotula, P. J. Rothenberg, J. R. Burge and M. B. Solomon

*J. Food Prot.* 51:691-695

The objectives of this study were to determine whether the distribution of *Trichinella spiralis* larvae within the diaphragm of infected swine was the same throughout five anatomically identifiable portions, and to assess the tenability of the Poisson model to describe the probability of detecting larvae in samples of digested tissue.

To examine differences in levels of infection among the regions of the diaphragm, sixteen 2-month-old and fourteen 6-month-old swine were infected with approximately 300 *T. spiralis* larvae per animal. Since the infective dose was not adjusted for age (weight), higher infection rates resulted in the younger hogs. Because of this higher infection rate, the occurrence of positive samples judged to be free of larvae (false negatives), was lower for the younger hogs (0.9% vs 14.6%). Pooling over both age groups and across all five anatomical regions yielded the directional difference in false negative rates one would expect between 1 g and 5 g samples (viz., 12.3% for 1 g vs 2.6% for 5 g).

In both age groups, levels of infection were significantly different among the five anatomical regions of the diaphragm ( $p=.06$  at 2 mo;  $p=.0002$  at 6 mo). The Crus muscle consistently yielded more larvae/g than the lumbocostal arch, the dorsal and ventral Pars costalis, and the Pars sternalis. Accordingly, the false negative rates were found to be lowest in the Crus muscle (5 of 59 or 8.5% in 1 g samples and 0 of 58 in the 5 g samples). We conclude that sampling from Crus muscle increases the ability to detect *T. spiralis* larvae in the diaphragm of infected pork carcasses. Moreover, we demonstrate that the Poisson model (random or "homogenous distribution" of larvae) grossly underestimates the observed false negative rates while predictions based on the negative binomial model provide close agreement.

**Composition of Grade A and Manufacturing Grade Herd Milks in South Dakota**, Robert J. Baer, Joel L. Sommerfeldt and Karen M. Tieszen, Dairy Science Department, South Dakota State University, Brookings, South Dakota 57007-0647

*J. Food Prot.* 51:696-699

Biweekly Grade A and manufacturing grade herd milk samples were collected from April 1, 1985, to March 31, 1986, from 203 herds in the Sioux Falls, SD, area and were analyzed to compare composition. The average herd milk composition was 3.70% fat, 3.24% protein, 4.80% lactose, 0.63% ash, 8.67% solids-not-fat (SNF), and 12.37% total solids (TS). Grade A milk had higher % lactose (4.83 and 4.76), % SNF (8.70 and 8.61), and % TS (12.41 and 12.30) than manufacturing grade milk. These compositional differences between grades were consistent throughout the year. Grade A milk has more value in the production of dried dairy products (nonfat dry milk and whey powders) and ice cream than manufacturing grade milk due to its higher lactose and SNF content. New milk pricing plans for protein and other constituents should consider compositional differences (lactose, SNF and TS) that exist between grade A and manufacturing grade herd milk before implementing them.

**Increased Sporulation of *Clostridium perfringens* in a Medium Prepared with the Prereduced Anaerobically Sterilized Technique or with Carbon Dioxide or Carbonate**, S. E. Craven, Richard B. Russell Agricultural Research, USDA-ARS, P.O. Box 5677, Athens, Georgia 30613

*J. Food Prot.* 51:700-706

Sporulation of ten strains of *Clostridium perfringens* was determined in Duncan-Strong sporulation medium prepared and stored in the presence of atmospheric oxygen (DS) or prepared as a prereduced anaerobically sterilized medium (DSPR). Numbers of heat-resistant spores were higher in DSPR compared to DS for 4 strains in fresh media and for 7 strains in stored media. For strains 8679 and 8799, spore numbers were as much as 5 logs greater in DSPR than in DS with a concomitant higher culture pH and fewer vegetative cell numbers. The effects of the addition of an antioxidant, degraders of hydrogen peroxide ( $H_2O_2$ ), or scavengers of oxygen radicals to DS or  $H_2O_2$  to DSPR do not suggest a role for toxic oxygen species in inhibiting sporulation of these two strains in DS. Increases in spore numbers and culture pH were similar in DSPR and in DS to which carbon dioxide ( $CO_2$ ) or sodium carbonate had been added. Modifications of sporulation media which increased the levels of  $CO_2$  or increased the culture pH improved sporulation of strains 8679 and 8799, respectively. These results suggest that improved sporulation in DSPR resulted from an improved buffering effect on culture pH or a direct effect of  $CO_2$  introduced during preparation of the prereduced medium.

**Growth, Germination and Toxigenic Activity of *Bacillus cereus* in Milk Product**, H. C. Wong, Y. L. Chen and C. L. F. Chen, Department of Microbiology, Soochow University, Taipei, Taiwan 11102, Republic of China

*J. Food Prot.* 51:707-710

**Growth, germination and toxigenic activity of *Bacillus cereus* in pasteurized milk, fruit-flavored reconstituted milk and fermented milk at 30°C** were studied. Vegetative cells of *B. cereus* rapidly increased to  $10^8$  CFU/ml in 8 h and  $10^6$  CFU/ml in 12 h in pasteurized milk and fruit-flavored reconstituted milk

respectively. In fermented milk, vegetative cells of *B. cereus* were killed or inactivated in 40 min; while about 31% of spores survived the 7 d test period. Spore germination of *B. cereus* was inhibited by fruit-flavored reconstituted milk and fermented milk. Chinese hamster ovary cells were transformed and/or lysed by pasteurized milk and sterilized milk with *B. cereus* cultured for 8 h and also by laboratory-prepared fermented milk with *B. cereus* introduced at the beginning of fermentation and incubated for 12 or 72 h.

**Chemical Forms of Iron, Calcium, Magnesium, Zinc, and Copper from Rat Diets Containing Tea**, Lauren S. Jackson and Ken Lee, Food Science Department, 1605 Linden Drive, University of Wisconsin-Madison, Madison, WI 53706-1565

*J. Food Prot.* 51:711-714

Chemical forms of iron, calcium, magnesium, zinc and copper were measured in rat diets containing 0-3.5% instant black tea. As instant tea in diets increased, more iron was soluble and ionic. Diets containing tea had more complexed iron than without. Calcium had low solubility (10-12%) while almost all magnesium (92-98%) was soluble in all diets. Solubility of zinc and copper increased as the level of tea in diets increased. Chemical availability of iron, calcium, magnesium and zinc was measured in a rat diet without tea (control), containing 2.31% black tea solids and containing 2.31% green tea solids. The control had more soluble (56%), ionic (37%) and complexed (19%) iron than green tea (18%, 2.3%, 16%, respectively) or black tea (8.7%, 4.8%, 3.9%, respectively) diets. Diets did not differ in calcium or magnesium solubility. Zinc was more soluble in both tea diets than the control. Some mineral profiles of the rat diets could be predicted by mineral profiles of teas alone. Changes in mineral profiles were induced by mixing tea with diet components or by freeze drying tea. Chemical availability of minerals in rat diets predicted some but not all results from a rat bioavailability assay.

**Use of Microwave Ovens to Pasteurize Milk**, Kathleen M. Knutson, Elmer H. Marth and Mary K. Wagner, Department of Food Science and The Food Research Institute, University of Wisconsin-Madison, Madison, Wisconsin 53706

*J. Food Prot.* 51:715-719

High-temperature short-time (HTST) and low-temperature long-time (LTLT) pasteurization were simulated using uninoculated and inoculated milks that were heated in microwave ovens. Heating milk (76 ml) for 59 s at 700 W achieved a temperature of 71.7°C, but heating for 60-65 s and holding for 15 s failed to inactivate all added cells of *Salmonella typhimurium*, *Escherichia coli* or *Pseudomonas fluorescens*. Milk, 453.6 g (ca. one-half quart) or 604.8 g (ca. two-thirds quart), was heated to >62.8°C, but <71.7°C, in 4.5 to 5 min, depending on power (550 or 700 W) that was used, and refrigerated overnight. Such treatments failed to reduce the population of *Streptococcus faecalis* in the milks by the degree that occurred when inoculated milk was heated in a water bath at 62.8°C for 30 min.

**Feasibility of a Heat-Pasteurization Process for the Inactivation of Nonproteolytic *Clostridium botulinum* types B and E in Vacuum-Packaged, Hot-Process (Smoked) Fish,** M. W. Eklund, M. E. Peterson, R. Paranjpye and G. A. Pelroy, U.S. Department of Commerce, NOAA, National Marine Fisheries Service, NWAFC, Utilization Research Division, 2725 Montlake Boulevard East, Seattle, Washington 98112

*J. Food Prot.* 51:720-726

This study demonstrates the feasibility of a heat-pasteurization process for certain vacuum-packaged hot-smoked fishery products for inactivation of the spores of the nonproteolytic Group II *Clostridium botulinum* types B, E, and F. This process permits the use of lower concentrations of salt and other inhibitors without jeopardizing safety and quality of the products during prolonged refrigerated storage. The pasteurization treatment was developed based upon the inactivation of nonproteolytic types B or E in hot-process (smoked) salmon. Smoke was not applied to the samples inoculated with types B and E because of its possible inhibitory effects. After processing in the smokehouse, each sample was cooled to 34°F (1.1°C), injected with  $10^6$  spores, vacuum-packaged, and then heat-pasteurized in a water bath held at a constant temperature. A total of 85, 65, and 55 min in the 185°F (85°C), 192°F (88.9°C), and 198°F (92.2°C) baths, respectively, prevented toxin production by type E during 21 d of incubation at 25°C. Longer times, 175, 85, and 65 min, respectively, were required to prevent toxin production by nonproteolytic type B. Toxin production by type E during 120 d of storage at 10°C was prevented by a 45-minute treatment in the 198°F (92.2°C) bath. When heat-pasteurized samples were transferred into TPGY broth and incubated anaerobically for 150 d at 25°C, outgrowth and toxin production by type E was prevented by a 55-minute process at 198°F (92.2°C) and type B was prevented by a 65-minute process. This process does not, however, inactivate the more heat-resistant proteolytic strains of *C. botulinum* Group I or other spore-formers. The packages and master cartons of these pasteurized products therefore should follow the existing recommendations for smoked fishery products and be labelled "Keep refrigerated - Store below 38°F (3.3°C)."

**Determination of Ethylene Dibromide in Tropical Fresh Fruits Using Dean-Stark Apparatus and ECD-Gas Chromatography,** Yumiko Nakamura, Yukari Hasegawa, Yasuhide Tonogai, Minoru Hanafusa, Hideaki Hirose, Yoichi Taharasako and Yoshio Ito

*J. Food Prot.* 51:727-730

The concentration of residual EDB (ethylene dibromide) in tropical fresh fruits imported to Japan were investigated using the Dean-Stark apparatus and ECD-gas chromatography (ECD-GC) i.e. EDB was distilled into a small amount of n-hexane using a Dean-Stark apparatus and determined by ECD-GC. Recovery of EDB added to papaya pulp at the concentration of 0.1 ppm was more than 98.1% by the proposed method. The relationship between storage conditions and concentration of residual EDB was investigated for mango pulps; it was clarified that EDB content in mango pulps decreased with the storage time at room temperature (25°C) and refrigerated (7°C), but the content did not decrease for 6 d at -20°C. We surveyed the concentration of residual EDB in pulps, peels and seeds of the fresh fruits (grapefruits, papayas, mangos and litchis) imported to

Japan in 1987 separately. Extremely high concentrations of EDB were found in the seeds of grapefruits. A similar trend was also observed in other fruits.

**Effect of Magnesium and Iron on the Growth of and Production of Extracellular Proteins by *Staphylococcus aureus* Strain S-6,** Elisa Yoko Kirooka, Sonia Presa C. de Salzberg and Merlin S. Bergdoll Departamento de Pathologia Geral, Centro de Ciências Biológicas, Gundacao Universidade Estadual de Londrina, Caixa Postal 6001, 86.051, Londrina, PR, Brasil, Departamento de Ciência de Alimentos, Faculdade de Engenharia de Alimentos, Universidade Estadual de Campinas, Caixa Postal 6121, 13.100, Campinas, SP, Brasil, and Food Research Institute, University of Wisconsin, 1925 Willow Drive, Madison, Wisconsin 53706

*J. Food Prot.* 51:731-733

The effect of magnesium and iron on the growth, cellular morphology, deoxyribonuclease, coagulase, and enterotoxin B (SEB) production of *Staphylococcus aureus* strain S-6 in a pancreatic digest of casein (NAK) which had been treated with alumina to remove mineral ions was determined. Growth of *S. aureus* in the treated NAK medium (NAKSA) was minimal; the morphology of the cells was heterogenous with many large cells as well as some that were gram negative. The cells gradually reverted towards normal as the  $Mg^{2+}$  concentration was increased to 1.1  $\mu\text{g/ml}$ . Cell dry weight increased from  $0.36 \pm 0.27$  mg/ml to  $1.16 \pm 0.41$  mg/ml, DNase activity increased from 7.6 units/mg dry weight to 77.0 units/mg dry weight, and SEB production increased from 12.2 to 54.3  $\mu\text{g/mg}$  cell dry weight when the  $Mg^{2+}$  content was increased to 1.1  $\mu\text{g/ml}$ . Increasing the  $Fe^{2+}$  content above the 0.4  $\mu\text{g/ml}$  in the NAKSA medium containing 1.1  $\mu\text{g/Mg}^{2+}$  resulted in decreases in dry weight and DNase activity, a slight increase in SEB production, and a relatively large increase in coagulase production.

**Cultivation as an Estimate for Infectivity of Larval *Anisakis simplex* from Processed Herring,** Jadigwa Grabda and Jeffrey W. Bier, Academy of Agriculture, Szczecin, Poland, and Division of Microbiology, U.S. Food and Drug Administration, Washington, DC 20204, USA

*J. Food Prot.* 51:734-736

In vitro cultivation was used to estimate viability and potential infectivity of anisakine nematodes in edible fish. Salted and spiced Baltic herring were examined by dissection for the presence of larval *Anisakis simplex*. Stage-3 larvae, dissected from herring, were incubated for 4 d at 37°C in a medium containing liver extract and fresh bovine blood to enable dormant larvae to display spontaneous motion. In some instances movement became apparent only on days 2 or 3 in vitro. Larvae able to develop in vitro through one molt in these cultures were considered to have greater potential for causing disease in consumers than those that moved but did not molt. Mortality of larvae in fish increased as fish brining increased from week 1 to week 4, when it reached 100%. Salt concentration in the fish flesh also increased with time: 1 week, 5.6-8.2%; 2 weeks, 9.6-12.9%; 3 weeks, 11.6-14.0%; 4 weeks, 12.2-14.6%.

**Asbestos Fibers in Sake**, Shuzo Ogino, Nobutaka Fukumori, Tetsuko Yasuno, Masamichi Koseki and Masayoshi Kazama, Tokyo Metropolitan Research Laboratory of Public Health, 3-24-1 Hyakunincho, Shinjuku-ku, Tokyo 160, Japan

*J. Food Prot.* 51:737-739

Asbestos filters have been widely used to clear beverages in many countries including Japan, and despite warnings from the authorities, some Japanese sake companies have continued using such filters until recently. Forty-seven Japanese sake samples were analyzed using a transmission electron microscope to detect contamination with asbestos fibers. The concentrations of fibers found in sake samples ranged from  $<7.8 \times 10^3$  fibers/L (the detection limit) to  $1.96 \times 10^8$  fibers/L. Ten sake manufacturers provided information as to whether they had used asbestos in the filtration process and the remaining 37 did not (unknown group). Five out of the 10 manufacturers from which information was available had used asbestos (with asbestos group), and the other 5 had not (without asbestos group). The concentrations of fibers in the samples of the "with asbestos" group were more than  $7.7 \times 10^6$  fibers/L while those in the "without asbestos" group did not exceed  $2.8 \times 10^5$  fibers/L. The concentrations of fibers in the samples of the "unknown group" ranged from below the detection limits to  $1.46 \times 10^8$  fibers/L. Some brands of sake showed extremely high concentrations of asbestos fibers, and therefore it may be necessary to investigate the fate of ingested asbestos in the body and its possible carcinogenicity.

**The Calcium Content of Cottage Cheese Made by Culture and Direct Acidification**, B. J. Demott, Department of Food Technology and Science, The University of Tennessee, P.O. Box 1071, Knoxville, Tennessee 37901-1071

*J. Food Prot.* 51:740-742

Using atomic emission spectrophotometry, the average calcium content of 29 market samples of cottage cheese made by the culture method was found to be 76.6 mg/100 g, and that of 18 market samples made by the direct acidification procedure was 91.2 mg/100 g. The average calcium content of 24 samples of lowfat cottage cheese was 87.5 mg/100 g and that of 23 samples of 4% cheese was 76.7 mg/100 g. Lowfat direct set cottage cheese had the most calcium, 102.3 mg/100 g. Curd made in the laboratory by the culture and direct acidification procedure showed no significant difference in calcium content.

**A Novel Processing Approach for Rapeseed and Mustard Seed-Removal of Undesirable Constituents by Methanol-Ammonia**, Fereidoon Shahidi, Marian Naczek, Leon J. Rubin and Levente L. Diosady, Department of Biochemistry, Memorial University of Newfoundland, St. John's, Newfoundland, Canada A1B 3X9 and Department of Chemical Engineering and Applied Chemistry, University of Toronto, Toronto, Ontario, Canada M5S 1A4

*J. Food Prot.* 51:743-749

An overview of a novel two-phase solvent-extraction system developed for treatment of rapeseed and mustard seed in our laboratories will be presented. In this process, the polar phase consisted of a lower alkanol containing 5% water (v/v) and 10% ammonia (w/w). The non-polar phase was hexane. Of the alkanols, methanol was the most effective, followed by ethanol. Isopropanol and t-butanol were of limited usefulness. A meal with a protein content of about 50% was obtained, and there was essentially no loss of protein material. Its glucosinolate content was reduced by an order of magnitude. Over 2/3 of the phenolics were removed by  $\text{CH}_3\text{OH}/\text{NH}_3/\text{H}_2\text{O}$  treatment; however, the phytates were not affected. The protein in the meal had lower solubility properties, but a very high fat absorption as compared with the protein in hexane-extracted meal. The oil obtained from this process was essentially free of phospholipids and may be considered as degummed.

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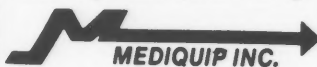
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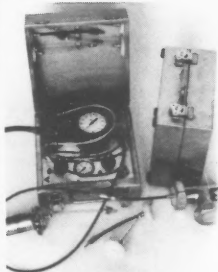
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# Coming Events

## OCTOBER

- **3-5, CONFERENCE ON LISTERIA MONOCYTOGENES**, will be held in Rohnert Park, California. It is sponsored by The Society for Industrial Microbiology. Additional information can be obtained from: Mrs. Ann Kulback, SIM, PO Box 12534, Arlington, VA 22209 703/941-5373.
- **8-9, MICROWAVE PROCESSING OF FOOD**, sponsored by AACC to be held in San Diego, CA. Information can be obtained by contacting: AACC Short Course Program, 3340 Pilot Knob Rd., St. Paul, MN 55121 612/454-7250.
- **9-13, AACC ANNUAL MEETING**, to be held at the Hotel InterContinental San Diego, in San Diego, California. For more information, contact: Raymond J. Tarleton, American Assoc. of Cereal Chemists, 3340 Pilot Knob Rd., St. Paul, MN 55121 612/454-7250.
- **12-13, IOWA ASSOCIATION OF MILK FOOD AND ENVIRONMENTAL SANITARIANS, INC.**, annual meeting to be held at the Ramada Hotel in Waterloo, IA. The meeting will be held jointly with IHEA. For more information contact: P.O. Box 69, Manchester, IA 52057, 319-927-3212.
- **15, RISK ASSESSMENT, RISK MANAGEMENT AND RISK COMMUNICATIVE STRATEGIES IN FOOD REGULATION**. Conference for Food Protection workshop, Grosvenor Resort, Orlando, Florida. Contact: P. Packett, Florida Dept. of Agriculture & Consumer Services, 408 Mayo Bldg., Tallahassee, FL 32399-0800 904/488-6336.
- **15-19, MILK INDUSTRY FOUNDATION & INTERNATIONAL ICE CREAM ASSOCIATION ANNUAL CONVENTION & SHOW**, to be held at Marriott's Orlando World Center, Orlando, Florida. For more information, contact: John F. Speer, Jr., 888 16th St., NW, Washington, DC 20006.
- **15-19, CONFERENCE FOR FOOD PROTECTION**, Grosvenor Resort, Orlando, Florida. Contact: P. Packett, FL Dept. of Agric. & Cons. Svcs, 408 Mayo Bldg., Tallahassee, FL 32399-0800 904/488-6336.
- **17-19, BIOTECHNOLOGY PROCESSING ENGINEERING CENTER FOURTH ANNUAL SYMPOSIUM**, to be held at the Massachusetts Institute of Technology, Cambridge, Massachusetts. For additional information, contact: MIT, BPEC, Room 20A-207, Cambridge, MA 02139 617/253-0805.
- **17-20, ASBESTOS ABATEMENT: FACILITY SURVEY AND BUILDING SYSTEMS**, to be held at the University of Florida, Gainesville, FL. For more information, contact: Peggy Cook, University of Florida TREECO Center, Gainesville, FL 32608-4838 904/392-9570.
- **18-19, CALIFORNIA ASSOCIATION OF DAIRY AND MILK SANITARIANS CONFERENCE**, to be held at the Concord Hilton Hotel, Concord, California. For more information, contact: Jack Coppes, Executive Secretary, PO Box 9234, Whittier, CA 90608, 213/699-4313.
- **20-22, ASBESTOS ABATEMENT: MANAGEMENT PLANNING**, to be held at the University of Florida, Gainesville, FL. For more information, contact: Peggy Cook, University of Florida TREECO Center, Gainesville, FL 32608-4838 904/392-9570.
- **24-25, PESTS ASSOCIATED WITH FOOD INDUSTRY AND ENVIRONMENTAL SANITATION SEMINAR**, Okumura Biological Institute, Holiday Inn, Elk Grove Village, IL. Contact: George Okumura, 6669 14th St., Sacramento, CA 95831 916/421-8963.
- **31-November 3, FOOD PROCESSING WASTE CONFERENCE**, will be held at the Pierremont Plaza Hotel, Atlanta, Georgia. The conference is sponsored by the Environment, Health and Safety Division, Georgia Tech Research Institute. Additional information can be obtained from Edd Valentine or Chuck Ross, Georgia Tech Research Institute, Economic Development Laboratory, Environment, Health and Safety Division, Atlanta, GA 30332, 404/894-3412.

## NOVEMBER

- **2, SANITATION WORKSHOP FOR THE FOOD INDUSTRY**, Inn at the Park, Anaheim, CA. Presented by the University of California Cooperative Extension with assistance from industry trade associations and food industry personnel. Bacteriological concerns, environmental sampling, cleaning and sanitizing compounds, and regulations will be emphasized. For more information, contact: Kathryn Boor, Food Science and Technology, UCD, Davis, CA 95616 916/752-1478.
- **1-3, BASIC PASTEURIZATION COURSE**, to be held at the Viscount-Travel Lodge, 1818 Southwest Freeway, Houston will be sponsored by the Texas Association of Milk, Food and Environmental Sanitarians. For more information, contact: Janie Park, TAMFES, PO Box 2363, Cedar Park, TX 78641-2363, 512/458-7281.
- **1-3, NORTH DAKOTA ENVIRONMENTAL HEALTH ASSOCIATION**, annual fall conference to be held in Minot, North Dakota at the Holiday Inn. For more information contact: Peri Dura 701/224-2382.
- **2-4, GUM CHEMISTRY AND TECHNOLOGY**, will be held in Chicago, Illinois. For more information, contact: AACC Short Course Program, 3340 Pilot Knob Rd., St. Paul, MN 55121, 612/454-7250.
- **14-18, HAZARDOUS WASTE SITE SAFETY**, held at the University of Florida, Gainesville, FL. For more information, contact: Sharon Baker, Registrar or Michael DeLuz, Program Assistant, TREECO Center - University of Florida, 3900 SW 63rd Blvd., Gainesville, FL 32608 904/392-9570.
- **16-18, HAZARDOUS MATERIALS: TRAIN-THE-TRAINER**, to be held at the University of Florida, Gainesville, FL. For more information, contact: Sharon Baker, Registrar or Michael DeLuz, Program Assistant, TREECO Center - University of Florida, 3900 SW 63rd Blvd., Gainesville, FL 32608 904/392-9570.
- **17, FOOD MICROBIOLOGY UPDATE**, to be held at the Holiday Inn Holiday, Sacramento, CA. Contact Kathryn J. Boor, Food Science & Technology, University of California, Davis, CA 95616 916/752-1478.
- **21, HAZARDOUS WASTE SITE SUPERVISION**, to be held at the University of Florida, Gainesville, FL. For more information, contact: Sharon Baker, Registrar, or Michael DeLuz, Program Assistant, TREECO Center - University of Florida, 3900 SW 63rd Blvd., Gainesville, FL 32608 904/392-9570.
- **28-December 1, NATIONAL MILK PRODUCERS FEDERATION ANNUAL MEETING**, to be held at the Hilton, Anaheim, California. For more information, contact: James C. Barr, 1840 Wilson Blvd., Arlington, VA 22201.
- **30-December 1, FIELD AND LABORATORY SAMPLING OF FOOD, DRUGS, AND AGRICULTURAL COMMODITIES**, to be held in Arlington, Virginia. Course size is limited and on a "first come" basis. To register, first verify space availability by calling or writing AOAC Education Dept., 1111 N 19th St., Suite 210, Arlington, VA 22209, 703/302-3032.

## DECEMBER

- **5, PESTICIDE APPLICATOR CERTIFICATION SEMINAR**, Okumura Biological Institute, Clarion Hotel, Sacramento, CA. Contact: George Okumura, 6669 14th St., Sacramento, CA 95831 916/421-8963.
- **6-7, 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.
- **8-9, 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.

- 8-9, **STARCH: STRUCTURE, PROPERTIES AND FOOD USES**, sponsored by AACC to be held in Chicago, Illinois. Information can be obtained by contacting: AACC Short Course Program, 3340 Pilot Knob Rd., St. Paul, MN 55121, 612/454-7250.

1989

**JANUARY**

- 23-27, **INSECT FRAGMENT SEMINAR**, Okumura Biological Institute, Clarion Hotel, Sacramento, CA. Contact: George Okumura, 6669 14th St., Sacramento, CA 95831 (916) 421-8963.

**FEBRUARY**

- 20-22, **ABC RESEARCH 15TH ANNUAL TECHNICAL SEMINAR**, Hilton Hotel, Gainesville, FL 32608. For additional information, contact: Sara Jo Atwell, 904/372-0436.

**MARCH**

- 29-30, **THE CENTER FOR DAIRY RESEARCH** at the University of Wisconsin-Madison will be holding its annual Cheese Research and Technology Conference at the Holiday Inn East, Madison, WI. For more information, contact: Sarah Quinones 608/262-2217.


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# From the Ames Office . . .

**Kathy R. Hathaway**  
*Executive Manager*  
IAMFES

There are many times during the year we correspond through letters to the membership. Although that will continue, we'd like to keep you updated on a more timely basis, through the use of this new column. Please feel free to submit questions you'd like answered in this column about IAMFES and the headquarter office.

The 75th IAMFES Annual Meeting was certainly a success with over 800 in attendance. The Florida Affiliate in charge of Local Arrangements did a great job in orchestrating the meeting. The program was also excellent with 3 full days of sessions. Everyone involved is to be commended for a job well done.

The board approved a change for IAMFES Membership and Subscriptions. In the past, all memberships and subscriptions were on a calendar year basis. If you began your membership in June, you received 6 months of back issues. Many comments have been made in the past year on the calendar year set up, with people requesting a 12 month membership/subscription as you would have with other magazines.

All current members will receive renewal notices beginning in September, as your present membership/subscription expires with your December issue. If you wish to remain on a calendar year, just renew by mid December and you will remain on the same schedule. People who renew in January, will receive issues from February 1989 through January 1990. There will no longer be back issues. We will periodically run a list of table of contents if someone wishes to purchase a particular issue if they are available.

Back issue costs, guesstimates on how many journals to order each month, mailing costs and other reasons led to this decision. It was getting to a point where we were running out of early issues, January, February and not being able to fill the calendar year orders for members and subscribers. We hope you will like this new procedure.



Again, if you wish to remain on the same schedule, all you need to do is renew on time and nothing will change for you. New members for example that begin in June 1989 will end May 1990.

Another change which the IAMFES Executive Board approved was a name change for the association journal...which will now be *Dairy, Food and Environmental Sanitation*. Although the association name includes environmental and the association journals speaks to those issues, it was not being covered in the association journal name. You will also see cosmetic format changes inside and out. The cover starting with the January issue will be 4-color, depicting various outdoor scenery photos. Again, we trust you will be happy with the upcoming changes and look forward to your comments.

Mark your calendars now for the 76th IAMFES Annual Meeting at the Hyatt Regency Crown Center, Kansas City. Another beautiful facility right in the heart of Kansas City...August 13-17, 1989. Look for the February 1989 issues for all your hotel and meeting registration forms. Please make your reservations EARLY, especially your hotel reservations!

Until next time.  
Kathy R. Hathaway  
Executive Manager  
IAMFES, Inc.

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- ◆ Ceftazidime
- ◆ Ceftazole
- ◆ Ceftizoxime
- ◆ Ceftriaxone
- ◆ Cephalosporin C
- ◆ Cephamycin A
- ◆ Cephamycin B
- ◆ Cephamycin C
- ◆ Cephalirin Sodium
- ◆ Cephradine

### TETRACYCLINES (T)

- Tetracycline
- Choritetracycline
- Oxytetracycline
- Demeclocycline
- Methacycline
- Doxycycline
- Minocycline

### AMINOGLYCOSIDES (ST)

- Dihydrostreptomycin
- Streptomycin sulfate
- Neomycin
- Kanamycin
- Amikacin

- Gentamicin
- Tobramycin

### MACROLIDES (E)

- ◆ Troleandomycin
- ◆ Erythromycin  
Erythromycin Stearate  
Erythromycin Estolate  
Erythromycin Gluceptate  
Erythromycin  
Lactobionate  
Erythromycin Phosphate
- ◆ Spiramycin  
Erythromycin Thiocyanate
- ◆ Oleandomycin
- ◆ Tylosin
- ◆ Lincomycin
- ◆ Clindamycin

### SULFONAMIDES(SM)

- ◆ Sulfamethazine
- ◆ Sulfadimethoxine
- ◆ Sulfabromomethazine
- ◆ Sulfadimthoxine
- ◆ Sulfamethoxyypyridazine  
◆ Hydrochlorothiazide  
◆ Chlorothiazide  
◆ Furosemide  
◆ Trichloromethiazide  
◆ Dexamethasone  
◆ Sulfasuxidine  
◆ Dapsone  
◆ P-Aminosalicylic acid  
◆ Trisulfapyrimidine  
◆ Sulfamethoxazole  
◆ Phthalylsulfathiazole  
◆ Sulfachloropyridazine  
◆ Sulfanitran  
◆ Sulfaquinolaxine  
◆ Sulfathiazole  
◆ Sulfafomyxin  
◆ Thiabendazole  
◆ NOVBIOCIN (N)
- ◆ CHLORAMPHENICOL (C)



