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Dairy and Food Sanitation

A Publication for Sanitarians and Fieldmen

- The Food Service Manager Training and Certification Program
- Making the Most of Scientific Meetings
- Quality of Sour Cream and Non-Butterfat Sour Dressing



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Making the Most of Scientific Meetings

RICARDO J. ALVAREZ, Ph.D.

*Director of Quality Assurance
 GIBCO Laboratories
 2801 Industrial Drive
 Madison, WI 53713*

"Professional meetings vary considerably. At regional workshops, you usually follow a set schedule in its entirety and get to know many of the other participants. At national meetings, you must often choose among several simultaneous sessions. A preliminary program will give you an idea of the format and whether you want to attend."

Professional meetings away from home, work and the laboratory can often add up to an exciting educational experience, if everything goes smoothly. Included are some tips for insuring that you as a field and applied sanitarian will benefit from attending scientific meetings. Perhaps, by following some of these suggestions, you can bring home ideas that could be implemented in your daily field work.

Karen drove most of the night to reach the hotel headquarters for an annual scientific national meeting. There were barely moments to spare between registration and the opening session. She fell asleep as soon as the lights went down for the first batch of slides. Sue, used to wolfing down

cafeteria meals, budgeted a luxurious 90 minutes for lunch at an annual professional meeting. Her idea of luxury fell short of necessity. She chose to eat at a restaurant three blocks from the convention center, and it was jammed. By the time Sue got back, the afternoon session was well under way. John promised his supervisor he would tape an all-day workshop on instrumentation. Unfortunately, the batteries gave out halfway through the morning session. John spent his lunch break searching for replacements.

All these snafus commonly occur, especially to conventioners who should learn much at professional meetings, but not the hard way. Inefficient attendance, if we can call it that, wastes an expensive form of continuing education--a week's worth of transportation, lodging, meals, and registration fees may total as much as \$1,000.

Meanwhile, back at the home office the delegate's work piles up. It has to get done, even if it means bringing an extra part-time technologists or paying for overtime. On the positive side, these outings apparently buy something of real value, for each year hundreds of laboratorians make their debut at professional meetings. Beyond the rewards of learning, travel is exciting, and it provides a welcome break from the daily laboratory routine.

First of all, you should have realistic expectations. Some objectives should include the following:

- To learn about new techniques and equipment.
- To improve skills with specific methods.
- To keep up-to-date in the field.

- To interact formally or informally with colleagues.

Professional meetings vary considerably. At regional workshops, you usually follow a set schedule in its entirety and get to know many of the other participants. At national meetings, you must often choose among several simultaneous sessions. A preliminary program will give you an idea of the format and whether you want to attend.

Most professional organizations (like IAMFES), announce upcoming meetings through the mail or in professional journals. The announcement usually includes a brief agenda, names of faculty members or speakers, dates, locations, and fees. Once you've attended an organization's meeting, you will probably receive future programs automatically.

Before we dip deeper into the program, here's a word of advice about the remainder of the preliminary pre-meeting information package: Determine whether it contains housing registration forms. Some organizations reserve a block of rooms for members; others simply distribute a list of area accommodations. Don't delay booking a room on the assumption you're guaranteed space at the "site" hotel. You could be forced to accept lodging far from the conference site (see Insert 1).

Now for the program, which usually contains one or all of the following components:

Scientific papers.

These sessions may group around specific topics or problem areas, or spew out a hodge-podge of reports. Some meetings also include research sessions, during which investigators discuss preliminary findings. Review

Insert I

WHEN THE PROGRAM ARRIVES

- Evaluate it and decide whether the meeting is worth attending.
- If you decide to go, start securing any necessary approvals and travel authorizations.
- Evaluate simultaneous presentations--you can't be in two places at once.
- Return meeting application forms as soon as possible. Registration, especially for wet workshops, is often limited.
- Make hotel reservations promptly otherwise you wind up far from the meeting rooms.
- Firm up remaining travel arrangements. Remember that many discount air fares require you to book weeks in advance.
- Contact colleagues at other laboratories or offices. You may be able to share transportation to and from airports.
- To avoid foul-ups, confirm registration and housing arrangements handled by the sponsoring organization.

the program and decide if any of the papers given will be of assistance to your present needs or are of personal interest.

Workshops.

Choose early and carefully among these offerings. They furnish an excellent opportunity for in-depth continuing education, but because of limited seating often require advance registration with an additional fee. Workshops are either "wet", with registrants actively engaged in the benchwork, or "dry", which means presentations and demonstrations but little individual participation.

At a "wet" workshop, the sponsor usually provides supplies and equipment. The advantages are obvious. You can learn how to perform new tests or improve your technique through actual hand-on work, and a low instructor/participant ratio permits close contact with experts. Drawbacks include limitations on the number of registrants and the amount of material covered.

"Dry" workshops can accommodate much larger audiences. Similar

to traditional scientific lectures, they range over more ground than "wet" workshops. They may help you review general methodology or diagnostic modalities that are applicable to a specific problem(s) that might be encountered in the field.

Most workshops, wet or dry, give registrants a manual or course guide. This material is a valuable reference.

There are other considerations. Who's giving the workshop, for example? Are they recognized as experts in the field? Do they want to educate you or merely promote certain equipment?

Medical centers or other institutions are frequently best equipped to handle these specialized programs. Hotels aren't likely to have adequate lab-style facilities for wet workshops.

Some of the more informative workshops go on the road, from one meeting to the next. Try to find a laboratorian or colleague who has already taken the course and get an evaluation.

Roundtable discussions.

Panels, frequently scheduled dur-

ing the lunch break, feature experts in a designated field. Panelists may be seated on a dais or at various tables throughout the dining room. The informal atmosphere and seatings of eight to ten persons per table allow easy conversation with the speakers. It's also a quick and educational way to get lunch. Consult the program for seating capacity and meal charges.

Exhibits.

The exhibit area usually occupies a well-traveled section of the convention center or headquarters hotel. Scientific exhibits present the findings of individual laboratorians, hospitals, medical schools, and other non-commercial groups. Investigators are often available during specific times to discuss their work. Commercial exhibits, sponsored by manufacturers, showcase laboratory products and may offer free samples or literature. Sales representatives staff the booths throughout the convention, although the precarious state of the economy has taken its toll in recent months. Work the booth area, talk with the sales representatives, discuss their products and see how their products can help you and your work.

Business meetings.

Most organizations conduct their annual business meetings at their conventions. Unfortunately, too few laboratorians and society members take the time to attend these sessions. Remember, the association's business decisions affect all members.

Social events.

Functions at major meetings may range from group tours to cocktail parties and dinners in the evenings or on the weekends before and after the meeting. Some events for guests

take place during the scientific sessions. The information or registration desk should be able to fill you in on activities, as well as supply directions, maps, brochures, and discount coupons for local attractions.

Assuming you take the advice of arriving in town well before the meeting convenes, I suggest setting up camp in the manner outlined in Insert II. Once you've done all this, check out the meeting rooms. At least, find out where they are. You don't want to waste time searching through corridors for a scheduled session and then miss getting a good seat.

At workshops, participants often work in pairs. If you can, get there early, meet the other registrants, and try to pick a partner who seems to know something about the subject. Don't hesitate to ask questions, participate. Take every opportunity to quiz instructors or speakers on personal preferences in equipment or techniques. If they're reluctant to express an opinion in public, ask them privately, off the record.

Learn your way around the exhibit area. Instead of wandering aimlessly, head directly for the exhibits you want to see. Be firm with commercial exhibitors who try to detour you.

After discussing an exhibit with a salesman, stop by a competitor's booth, and compare products. This is a valuable way to assess the advantages and disadvantages of kits and equipment. Sales representatives are very anxious to tell you what's right about their products and what's wrong with a competitor's line. Pick up extra handouts for your colleagues back at your laboratory or office. And if an exhibitor offers free beverages or food, don't be shy. You

might as well snack while you listen to the pitch.

Most of all, try to have some fun. The organization's social program offers pleasant breaks in a hectic pace. Many meeting-goers find these informal get-togethers with colleagues and speakers far more valuable than structured sessions. But beware. Excessive partying and late hours

don't mix with early morning workshops.

Finally, try to relax on the return trip. You still have a few details ahead of you (see Insert III), and it's business as usual the next day back at the laboratory or the office. Above all, remember that all your co-workers think you've been off on a free vacation.

Insert II

WHEN YOU ARRIVE

- Register with the sponsoring organization. If possible, stop by the desk before the meeting opens--this can minimize standing in line. Don't forget to pick up your program, identification badge, and any admission tickets for workshops or roundtable discussions.
- Study the program and plan your activities. Check the scientific papers you wish to hear. Those you can skip will give you free time to visit the exhibit area.
- Note those displays you particularly want to see or discuss with the exhibitor. Most remain open during lunch breaks.
- Recharge your tape recorder. Purchase batteries or tapes, if necessary.
- Stock up on your favorite snack foods. At larger meetings, restaurants are often so crowded that you have to choose between eating lunch and attending the first afternoon session. When this happens, I relax in my room, partake of peanuts or candy bars, and forgo leisurely dining until the evening meal. This also gives me a chance to review and organize my notes and tapes.

Insert III

WHEN YOU RETURN HOME

- Go over notes, tapes, and literature you picked up at the meeting; you might have to write a report to your Supervisor about your trip.
- Select those tapes and reprints you want your colleagues to review.
- Draft your recommendations concerning equipment purchases, methodology changes, and the dissemination of new information.
- Review the items that might be added to your teaching or demonstration materials.
- Make a list of meeting-related topics for an upcoming staff meeting or continuing education session.
- Discuss the convention with your staff, your peers, and your supervisor. Everyone will appreciate your effort. Your boss will be impressed, and you'll find it easier to win approval for the next meeting.

Why do health officials everywhere take NSF logos very seriously?

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Mr. Charles K. Foster, Director,
Division of Water Hygiene
Texas Department of Health, Austin, TX

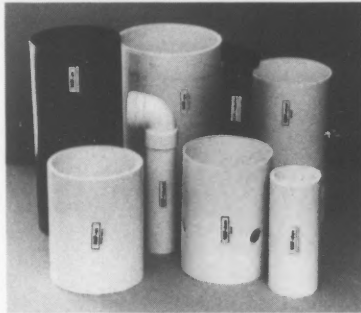
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Mr. Ralph C. Pickard, Assistant Comm. for Env. Health, Indiana State Board of Health, Indianapolis, IN

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Mr. Joe D. Brown, Director, Bureau of Environmental Health, Mississippi State Board of Health, Jackson, MS

When the people we serve say such nice things about us—need we say more?



National Sanitation Foundation

Offices and laboratories, P.O. Box 1468, Ann Arbor, MI 48106 Phone: (313) 769-8010

The Food Service Manager Training and Certification Program

“Since sanitary control over food establishments is traditionally a function of state and local agencies, along with consultation and advice from the FDA, the training program may logically be administered through these areas.”

K. J. BAKER

Senior Food Consultant
Division of Food Service
Bureau of Foods
Food and Drug Administration
PHS
Washington, DC. 20204

Attempts have been made over the years to implement a national training and certification program for food service managers. The movement may be gaining momentum. It seems logical to administer such a program through state and local agencies, with advice and help from the U.S. Food and Drug Administration. A model program was developed and field-tested in Ohio, which included a 25-hour food service training program, student manual, and certification to those who satisfactorily completed the course. Results, showing improvement in participant's knowledge and a higher level of food protection in food establishments, were encouraging. Similar programs were also conducted in Colorado and Virginia. Recommendations and guidelines have been made, there is possibility of monetary support from the FDA, and future plans are in order. Now the proposed program needs widespread support and acceptance.

Many people think a nation-wide training and certification program for food service managers is a good idea: the U.S. Food and Drug Administration, the National Conference on Food Protection, state and local agencies in Ohio, Colorado and Virginia, and many others.

Unfortunately there isn't any such thing. There is no nationally recognized program for training or testing which requires an operator or manager to have any knowledge of safe food handling practices.

Many attempts have been made in the past by state and local regulatory agencies to train food handlers. In

most cases attendance has been poor, and few management-level employees have enrolled.

In 1971 the National Conference on Food Protection recommended all persons engaged in food handling -- especially owners, operators, or managers -- should demonstrate that they have knowledge of safe food handling practices prior to entering business.

The FDA agrees a coordinated effort of federal-state-local enforcement agencies with the food service industry is necessary to produce a marked improvement in food service establishment sanitation and food handling practices.

Since sanitary control over food establishments is traditionally a function of state and local agencies, along with consultation and advice from the FDA, the training program may logically be administered through these areas.

Model programs must necessarily be national in scope, and available for adoption by state and local regulatory agencies. The mobility of persons working in food handling operations demands this.

The objectives of the proposed programs include the following:

- To significantly increase the level of consumer food protection by having an establishment operated under the management of a certified food service person.
- To obtain more cooperation between the regulatory agency and the food service industry in meeting sanitary requirements.
- To conduct a series of food service training courses, and certifying those persons who demonstrate their competence in the area of safe food protection.

Some important accomplishments have already been made. For instance, adequate training, a necessary part of any effective food service program, has been implemented by many regulatory authorities.

Many state and local enforcement agencies also issue permits or licenses to operate food service facilities. A few of these same agencies by law certify food service personnel.

But the FDA decided the best way to develop and field test a model program on the national level would be to work with one state. In 1973, they negotiated a contract with the Ohio Department of Health to develop a training program to certify participants who satisfactorily completed the course. In conjunction with industry and other interested parties, Ohio developed a 25-hour food service program, including a student manual.

Additional funds were then provided to Ohio to evaluate the training program it had developed. The FDA presumed the owners-operators-managers who had completed the course would show improvement in the sanitation level of their establishments.

The final report from Ohio included the following recommendations for starting an effective training program:

- Solicit support of the food service industry, public health agencies and other interested parties.
- Seek technical advice from the food service industry, public health and other interested persons.
- Form technical advisory committees to provide the necessary expertise for program development.
- Provide qualified instructors to teach the subject material.
- Establish and maintain rapport of the technical committees and industry.
- Establish and maintain a close association with certified managers.
- Enlist and maintain the support of local health departments which is crucial to the continuing success of the program.

Data released later showed improvement in participant's knowledge as well as a higher level of food sanitation in the Ohio establishments inspected.

Two FDA contracts were then awarded to the states of Colorado and Virginia to implement the Ohio program. These states have completed the contracts with final

reports to the FDA showing similar findings and recommendations as seen in Ohio.

In 1975, the principal investigators of the programs in Ohio, Colorado and Virginia met with FDA and Center for Disease Control representatives. They discussed the current status of the training and certification program for the food service industry.

The following recommendations were agreed on. It was hoped these would promote the training and certification program if there was to be any uniformity in its development and implementation.

Certification must mean the same thing to all persons. That is, one who is certified is understood to have completed a course of approved subject matter to the satisfaction of the state regulatory agency responsible for the food service program.

Core topics should include: applicable sanitary requirements with self-inspection techniques; foodborne illnesses (microbiology, growth, morphology, nutrients, toxic foods); food handling practices (storage, preparation, service); personnel (hygiene, training, job description); equipment management (design, installation, materials, schedules); and insect and rodent control.

There was a consensus that any supplemental study as in the areas of nutrition, accidents, safety or insurance, would be given at the discretion of the teaching agency. Flexibility in the program, permitting modification of the course materials, was an important point.

The time frame suggested for instruction ranged from 15 - 18 hours for classroom activity supplemented with homework or study outside class.

A test over the material covered in the class was considered necessary at the conclusion of the course presentation. Pre-testing of students was recommended initially for teacher evaluation of subject matter, but in due time could be discontinued.

Consideration was given to the establishment of a national review board to approve training programs throughout the country. The board would maintain a national registry of accepted programs which would meet basic criteria for certification.

The development of criteria for the establishment of a recertification program was also considered. The development of this follow-up program would be essential if the certification program was to have real merit.

Where Do We Go From Here?

The FDA has 3 contracts with regulatory agencies who, in turn, subcontract with educational institutions to teach a course containing the subject matter described earlier. The overall program is to be supervised by the enforcement agency responsible for food service establishments.

The FDA has assembled teaching materials with suggested visual aids for use of any agency or institution which is interested in conducting a food service training program.

A training program which includes the subject matter currently considered necessary has been developed in conjunction with NSF by the National Institute for the Foodservice Industry and supported and promoted by the National Restaurant Association.

There may also be funds to provide "seed money" to initiate the training and certification program or develop a recertification program. To date, money requests for the development or implementation of food service training certification programs have totalled over \$2,000,000.00.

Future Plans as Envisioned by FDA

The FDA will:

- Continue to meet with representatives from the academic community, industry, regulatory agencies and consumer groups. They will discuss the development and promotion of a nationally recommended training course for the food service industry which will result in certification of those who satisfactorily complete the course.
- Promote the establishment of state committees to implement the national program with modifications deemed necessary to that particular state.
- Through regional personnel, promote the training and certification concept through regional seminars or individual contact with the states.

- Through the Cincinnati Training Facility, include in the "Current Concepts in Food Protection" courses information about the recommended national training and certification program.
- Promote statewide sanitation surveys of the food service industry to establish a base level from which improvement over a period of time can be observed.
- Continue to provide limited supplies of teaching materials and loan visual aids to those states and territories which conduct training programs.
- Work closely with any national organization to promote and support the training and certification concept through these organizations.
- Continue to request funds for assistance in implementing the recommended national training program for the food service industry.
- Work for the establishment of a national certification board to approve programs identical with the recommended national program. This would permit reciprocity among the states with agreements to that effect.
- Through certification committee, review periodically the training program(s) from all states to insure that updated material is being taught as current technology changes, and rules or regulations are amended or established.
- Perform follow-up field sanitation surveys as necessary to evaluate the training certification program.
- Develop publicity materials by the certification committee to advertise the entire program in a positive manner. Industry should be ready to assume responsibility in this area in due time.

As time goes on, and more effective training programs are established, the regulatory agencies may be able to reduce some of their current inspection activity. This will depend on the sanitation status of the industry, and on its cooperation. By working together, the image of the industry will be improved, and consumers will be provided an additional measure of food protection.



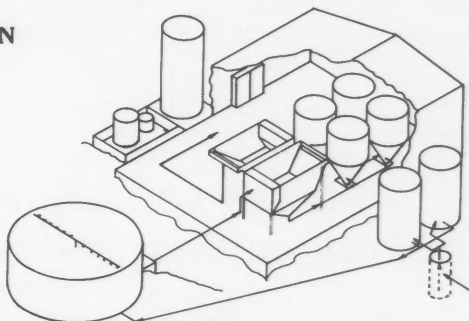
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NOTICE:

The Hospital, Institution, and Educational Food Service Society is giving 17 continuing education clock hours for attendance at the IAMFES Annual Meeting, August 22-26, 1982, Galt House, Louisville, Kentucky.

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QUALITY OF SOUR CREAM AND NON- BUTTERFAT SOUR DRESSING

**LESTER HANKIN,
DONALD SHIELDS, and
J. GORDON HANNA**

Two types of sour products are sold in Connecticut; dairy sour cream, a cultured product; and non-butterfat sour dressing. Code periods (days from manufacture to date stamped on the container) ranged from 25 to 90 days. Twenty-eight samples were tested.

Fat content averaged 19.1% for sour cream and 14.6% for non-butterfat sour dressings. Sodium content of all samples averaged 67 milligrams per 100 grams. Samples containing hydrolyzed vegetable protein were higher in sodium content. Non-butterfat products generally contained more additives than the sour creams. Two samples that did not declare the use of sorbate on the label contained this preservative.

Microbial contamination varied among types of products and brands. Only two samples contained a high number of aerobic bacteria. Seven samples contained substantial yeast contamination. Twelve samples contained a high number (greater than 10 per gram) of coliform bacteria.

Sour cream is enjoyed by many persons in such diverse ways as a base for chip dips, as a dressing for baked potatoes, as a topping on fruit or vegetables, and as an ingredient in

cooking and baking. In 1978 the average annual consumption of sour cream and dips was 817 grams (1.8 pounds) per person, about a three-fold increase from 1954. This compares closely with the growth in yogurt consumption to 1185 grams (2.6 pounds). And recently other sour products have been offered for sale, including the sour dressings, sour half and half, and non-butterfat sour dressings.

Sour cream is made by using lactic acid bacteria to produce acid and flavor compounds in a milk product or by acidifying the milk mixture with food grade acids, with or without the use of lactic acid bacteria or enzymes, usually rennin. The former product is labelled cultured sour cream and the latter acidified sour cream. In Connecticut, sour cream must contain at least 18% milk fat. Sour half and half and acidified sour half and half is made like sour cream and acidified sour cream, but regulations allow less milk fat (10.5 to 18.0%). The acidity of all soured products must not be less than 0.5% expressed as lactic acid.

There are no specific regulations for non-butterfat sour dressings except that wholesome ingredients must be used and labelling and listings of ingredients must comply with State regulations (8).

This study details by brand name microbial and chemical analyses of soured products offered for sale in food stores in Connecticut.

Adapted from Bulletin #795 of the Connecticut Agricultural Experiment Station, New Haven.

METHODS

Twenty-one samples of sour cream (including one sour half and half) and seven samples of non-butterfat sour dressing were collected at food stores in Connecticut during October through December 1980.

RESULTS AND DISCUSSION

Additives: All seven of the non-butterfat sour dressings but only 5 of the 21 sour creams stated on the label that a stabilizer or emulsifier was used. Stabilizers thicken the product and emulsifiers help keep fat dispersed. The usual stabilizers, vegetable gums and carrageenan, and the emulsifiers mono- and diglycerides were used. The use of tapioca flour was declared on the labels of two samples presumably added to thicken and enhance the consistency. Labels on two samples stated that hydrolyzed vegetable protein was added. Two samples showed on the label that a sweetening agent was used: dextrose and sugar, respectively.

Labels on all of the non-butterfat sour dressings indicated that hydrolyzed vegetable oil was the fat component. Either skim milk or water was the first ingredient listed (the component in the highest con-

centration). None of the dairy sour cream labels listed use of artificial color or flavor, but most of the non-butterfat products declared their use.

Labels on four samples listed use of an acidulant (lactic or citric acid or vinegar) probably to provide tartness. Cultured skim milk was listed as an ingredient in 3 samples.

Sodium citrate was a declared ingredient in three samples. This material is called a flavor precursor, since, in products cultured with lactic acid bacteria, the bacteria transform the sodium citrate to desirable flavor compounds.

Monosodium glutamate (MSG), a flavor enhancer reputed to act by stimulating the taste buds, was stated as being used in one sample. Sodium caseinate, derived from milk, was listed as an ingredient in a sample.

Code periods: The code periods (days from manufacture to date stamped on the container) for sour creams averaged 39 days but the range was wide, from 25 to 60 days. For non-butterfat sour dressings the code periods averaged 66 days; the range being from 30 to 90 days. The age of all samples at purchase varied

from 2 to 70 days. All samples were of satisfactory quality when purchased.

Microbial analysis: The total number of aerobic bacteria per gram of sour cream or non-butterfat sour dressing varied considerably among brands. There are no bacterial standards for these products, but for example, a total aerobic count of 50,000 per gram is acceptable in pasteurized cream. Thus, only two samples were above the standard for pasteurized cream. The number of acid-producing bacteria does not always coincide with the total aerobic count. The lactic acid bacteria used to ferment dairy products are fastidious in their growth requirements. If they are present in the manufactured product, most will not grow on the medium used for the total aerobic count. Bacteria other than lactic acid bacteria can produce acid.

Contamination by yeasts and molds varied among samples. Yeasts greater than 50 per gram are considered important. Mold contamination, except for a few samples was minimal. An excessive number of coliform bacteria (greater than 10 per gram) is not considered satis-

factory and could indicate poor packaging technique.

We also tested for gram negative bacteria able to degrade proteins and fats, the major components of sour cream and dressing. Many of these gram negative bacteria are psychrotrophic, i.e., able to grow at refrigeration temperatures and cause spoilage. Few of these bacteria were found in the samples, indicating that any bacterial contamination detected by the total aerobic count was by gram positive bacteria, which are less likely to cause spoilage than the gram negative bacteria.

Nutrient quality: The percentage of fat in the sour creams varied from 16.3 to 22.0%; averaging 19.1%. Only two samples contained less than the 18% butterfat required. The non-butterfat sour dressing averaged 14.6% fat.

The number of calories in the sour creams averaged 55 per 28.4 grams (one ounce or about 2 tablespoons) and 46 in the non-butterfat sour dressings. The protein content averaged 3.7% for the sour creams and 3.4% for the non-butterfat dressings. The carbohydrate content averaged 3.4% for the sour creams and 5.3% for the sour dressings.

The average sodium content of the sour creams was 67 milligrams per 100 grams, ranging from 43 to 113. The non-butterfat sour dressings averaged 68 milligrams per 100 grams, ranging from 38 to 120. Samples 3 and 27 were high in sodium content (520 and 248 milligrams per 100 grams, respectively). Their labels listed hydrolyzed vegetable protein, which can contain considerable salt, as well as salt as the third or fourth ingredient.

Sorbate, a food preservative used to counteract yeast and mold growth, was found in only 6 samples. It was not present in 2 samples that listed it on the label, however it was present in 2 samples that did not declare its use.

Acidity of the sour creams, a measure of tartness ranged from a low of 0.55% to a high of 0.95% (average 0.79%). All sour creams were within the regulation requiring at least 0.5% acidity calculated as lactic acid. Acidity of the non-butterfat sour dressings ranged from 0.70 to 0.96% (average 0.80%). Thus, each type of product generally had about the same tartness.

ACKNOWLEDGMENTS

We thank Susan Marafino, Sunrae McLean, Mamie Pyles, John Hayes, and Richard Hastings for the microbial and chemical analyses and Heather Leary for help in collecting the samples.

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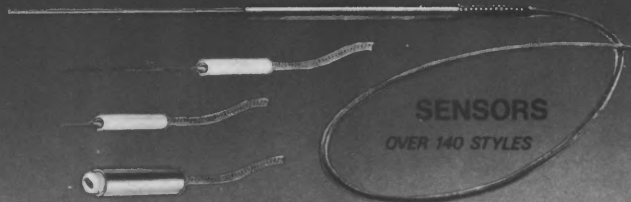
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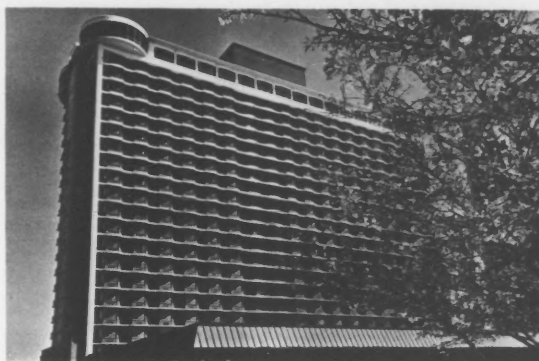
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Welcome to Louisville, "Derby City, USA". We invite you to attend the 69th Annual Meeting of IAMFES, August 22-26, 1982 at the Galt House, Louisville, KY. During the meeting a variety of events are planned, ranging from a cheese & wine reception to a cruise on the Belle of Louisville (a paddle-powered, triple decked, stern-wheeler). Music and an outstanding buffet will also be a part of this cruise. Spouses' entertainment will also be a big attraction at the '82 meeting. See you there!



1982 IAMFES ANNUAL MEETING

Advance Registration Form for the 69th Annual Meeting, Aug. 22-26, Louisville, KY.

Mail to:

Joe Schureck, Registration Chairman
Milk Control Branch
Health Services Building
275 East Main Street
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Please check where applicable:

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30 yr. IAMFES		50 yr. IAMFES	
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Banquet & Cocktail Hr.	15.00	15.00	\$15.00	17.00	17.00	17.00	17.00
Cruise- Belle of Louisville (entertainment & dinner)	12.00	12.00	12.00	15.00	15.00	15.00	15.00
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News and Events

Food Processing and Solar Energy

A four-year study by University of Wisconsin-Madison researchers has found that solar energy is not now economically feasible for food processing although it could supply 20-60 percent of the energy required.

"Approximately 5 percent of the energy consumed in the United States is consumed by food processing industries," says food scientist and agricultural engineer Daryl Lund. Wisconsin alone has 81 canning plants, 62 fluid milk plants and 422 cheesemaking plants.

Depending on the type of plant, the payback period for a solar installation varied from seven to 11 years, too long for most food processors to invest in solar. Most firms require a payback on investment with six months to four years before investing in new technology, Lund says. They have already installed energy-saving devices to turn on motors in sequence and switch off lights automatically. Such measures helped food plants cut their energy expenditure 20 to 25 percent over the last 10 years, says Lund.

But the high initial cost and the long payback period have kept food processors, as well as other industries, from adding solar systems. Between 1975 and 1980, only 61 U.S. industrial plants installed solar systems. "Solar is at best borderline for industry at this time," says Lund.

About 90 percent of the expense of a solar system is the cost of the solar collectors. "The biggest thing that has to happen for solar to catch on, is that the cost of the collectors will have to come down," explains Lund.

Other factors could make solar systems more competitive with the natural gas and electricity most plants now use to heat water. These include higher prices for fossil fuels and lower inflation and interest rates, Lund says.

The study evaluated the use of solar in milk, meat and cheese processing plants and in canning operations. These plants use hot water for pasteurizing milk, cooking

curd and whey, thawing frozen meat, blanching vegetables and cleaning up food preparation areas.

"We applied computer models to the energy needs as actually measured in representative plants from the different food processing industries," says Lund. The research showed how best to retrofit the food plants with solar collectors and a hot water storage system.

"Solar water heating is most economic for food plants that have a stable demand for hot water," says Lund. "You like to get as even a heating load as possible." Meat and dairy plants, with a constant demand for hot water week after week, are likelier to consider solar systems than canning plants, which have a short operating season when they need lots of hot water.

A solar hot water system can't provide all the energy needed in food processing operations, says Lund. Solar works best if the plant needs hot water, 130 to 190 degrees, rather than boiling water or steam.

In evaluating solar retrofits for the food industries, the study also found that parabolic collectors captured more of the sun's energy on a per dollar basis than the cheaper, flat-plate collectors. Lund says the volume of water uses for heat storage should be at least 40 liters for each square meter of collector surface. He advises industry not to scrimp on storage volume because it is relatively cheap, and additional volume can be used to accumulate heat over a weekend when most food processing plants are closed.

Lund was joined in the solar energy research project by Frederick H. Buelow and Rakesh K. Singh of the Department of Agricultural Engineering and John A. Duffie of the Solar Energy Research Laboratory.

For more information contact: Daryl B. Lund, 608-263-2008.

Monarch Offers Sanitation Literature

A sanitation program for milk bottling plants is detailed in a new literature set available from Monarch Chemicals Division of H. B. Fuller Company.

The package includes information on Monarch services for milk plants, including microbiology laboratory services, safety program, and in-plant sanitation school. Literature focuses on production procedures for quality control, such as on-line aseptic sampling and specific Monarch procedures and chemicals for bottling plant sanitation.

For a copy of the Milk Bottling Plant Sanitation Program, contact your local Monarch Chemicals representative, or write Monarch Chemicals Division, 3900 Jackson Street, NE, Minneapolis, MN 55421.

New Professional Sprayers Introduced

Geerpres is introducing a totally new, heavy duty line of professional sprayers for use in an extensive range of commercial and industrial applications, including the sanitary maintenance, food service and pest control markets.

The GPS sprayer line is designed for dispensing floor cleaners and strippers, pesticides, weed control chemicals and liquid fertilizers as well as all types of disinfecting procedures from aseptic cleaning to restroom care and sanitizing. They also are excellent for wall washing and baseboard cleaning.

For more information contact: Anne Greene, Geerpres, PO Box 658, Muskegon, MI 49443, 616-773-3211.

Real Appeal Cards

To help support the people who support the dairy industry, Babson Bros. Co., builder of Surge dairy farm equipment, has introduced REAL APPEAL cards.

The REAL APPEAL cards can be left behind on a restaurant table -- your personal endorsement of an eating establishment serving real dairy products.

The front of the card shows a piece of apple pie ala mode and a glass of milk with the words, "This is one of my favorite restaurants. They served me REAL DAIRY PRODUCTS!" It also has a space for your signature.

The back of the card leaves everyone with a final thought ... "I always ask for real dairy products."

The cards are available by writing: REAL APPEAL CARDS, Babson Bros. Co., 2100 South York Road, Oak Brook, IL 60521, include 50 cents per package of 50, to cover postage and handling.

New Cause of Food Poisoning

Campylobacter isn't a household name, but it could become one. A subspecies of this bacterial genus is a newly recognized cause of food poisoning.

"As a cause of food poisoning and gastroenteritis, this bacterium may be even more prevalent than Salmonella, which we know is a major cause of bacterial gastroenteritis," says food microbiologist Michael Doyle of the University of Wisconsin-Madison Food Research Institute. Doyle has developed a sensitive technique for detecting Campylobacter in foods. The test will allow scientists to screen foods for the bacterium.

People may develop Campylobacter enteritis--the technical name of the disease--after swallowing as few as 500 cells of Campylobacter. Doyle says some other causes of food poisoning require that millions of cells be ingested before an infection occurs.

The major symptoms of Campylobacter enteritis--abdominal pain, diarrhea and fever--appear two to five days after ingestion of the material. Patients usually recover in one to three days.

Because people may become infected after consuming a relatively low number of cells, researchers needed an effective method for detecting low numbers of Campylobacter cells. Doyle's technique works in three days and can detect as few as three cells in an ounce of food.

"Currently we don't know what the incidence of Campylobacter is in our food in general," says Doyle. People from the food industry and regulatory agencies are eager to use the technique to test foods for Campylobacter. Food processors routinely monitor their products for bacteria like Salmonella. But because work on

Campylobacter is so new and there have been no direct, sensitive tests until now, there are no established standards for the bacterium in processed foods.

Doyle says unprocessed foods like meat, particularly chicken, are an important potential source of Campylobacter food poisoning. Foods like these that are meant to be cooked are not subject to bacterial checks.

People should not consume raw milk, raw hamburger or undercooked chicken, warns Doyle. They should also avoid cross-contamination while preparing food. If you put uncooked chicken on a cutting board and then prepare a salad on the same surface without first washing it, you can cross-contaminate the salad with Campylobacter from the chicken, explains Doyle.

Doyle stresses that there are still many important unanswered questions about Campylobacter. "We know very little about the effect of various food processes or methods of food preservation on the ability of Campylobacter to survive in foods. We are only beginning to learn what treatments inactivate campylobacters when they are present in foods. And we don't know if all strains of the bacterium are equally pathogenic."

For more information contact: Michael P. Doyle, University of Wisconsin, Madison. 608-263-6936.

Ringenberg elected President of American Dry Milk Institute

Mr. John M. Ringenberg, Mid-America Dairymen, Inc., Springfield, Missouri, was elected President of the American Dry Milk Institute at the Institute's 57th Annual Meeting held in Chicago on April 21-23, 1982. Mr. Ringenberg previously had served as Vice-President of the organization; he is a member of its Executive Committee, and has served on a number of standing committees since being elected to the Board of Directors in 1964.

David N. Dickson, Carnation Company, Los Angeles, California, was elected Vice-President of the Institute, and Alfred J. Freisem, Michigan Producers Dairy Company, Adrian, Michigan, was re-elected Secretary-Treasurer.

The American Dry Milk Institute, founded in 1925, is the national trade association of the dry milk industry. It represents dry milk manufacturers in all areas affecting the dry milk industry, including government liaison, market development and promotion, product standards, and consumer relations. The Executive Director of the Institute is Warren S. Clark, Jr.

National Mastitis Council Meeting Highlights

Nearly 300 members of the National Mastitis Council took part in a very strong annual meeting program in Louisville, Kentucky during February.

Virginia Poly Technical Institute and State University and the University of Wisconsin presented convincing data which demonstrated that milk production is greatly influenced by an increase in somatic cell counts even at very low levels.

The Ohio Agricultural Research and Development Center discussed lactoferrin and other materials in the udder which protect the dry udder from infection. It was pointed out that the bovine mammary gland is more susceptible to new intramammary infections both at the beginning and near the end of the dry period. At these two times, the gland is undergoing functional change and fluid is accumulated in the gland and the absence of regular milk removal suggests that bacteria can colonize more easily in the canal of the teat. Dry cow therapy can provide adequate control of the new infections during the early dry period but there is a need for a method of control during the time just prior to calving.

Antibiotics, a band or blessing was the subject of the symposium on antibiotics. John Spaulding of the United States Department of Agriculture spoke on the total residue avoidance program. With the aid of a task force, he hopes to develop a basic management guide that includes not only good management practices but also identifies areas where residue still enter the system.

The University of Nebraska shared details of their successful on-the-farm mastitis program which has been underway since 1979. This extremely successful program has now reached 3,500 people in 81 locations around the state of Nebraska and dairymen are now calling the extension for assistance and development of a strong mastitis program on the farm.

Chosen to serve as president of the National Mastitis Council for the coming year is the University of Wisconsin Extension Dairymen, Dr. Allan Bringe. Long involved in Wisconsin's mastitis programs, Bringe succeeds Robert Dawson, Babson Brothers of Oak Brook, Illinois, who served as president during 1981. Elected to vice president is Arlan Schwinke of Morrison, Missouri, a dairymen who also serves as treasurer of Mid-America Dairymen, Inc.

The summer meeting of the National Mastitis Council will be held on Thursday, August 26, 1982 at the Galt House in Louisville, Kentucky and the 1983 annual meeting will be held on February 21-24, 1983 at the Executive West in Louisville, Kentucky.

For more information contact: John Adams, National Milk Producers Federation, 30 "F" Street NW, Washington, DC 20001, 202-393-8151.

National Fancy Food and Confection Show

British regional specialties will be highlighted at the National Fancy Food and Confection Show, New York Coliseum, June 27-30.

Fine Food From Scotland will be the focus on one booth, with products from six different companies. Smoked salmon, water from the Scottish Highlands, mustards and relishes from the Outer Islands, cookies and wrapped confectionery made to traditional recipes will figure prominently in the display.

English and Welsh cheeses will be promoted under the umbrella of the ENGLISH COUNTRY CHEESE COUNCIL. The large range now available to US retailers will be demonstrated with tastings and practical information on introductions and back-up promotional support.

These companies, with other regular exhibitors, will show in a group organized by the BRITISH FOOD EXPORT COUNCIL, whose members are responsible for 80 percent of Britain's processed food exports.

For more information contact: British Information Services, 845 Third Avenue, New York, NY 10022, 212-752-8400.

NRA Offers Educational Series

Four of the biggest challenges confronting restaurateurs during the next ten years will be analyzed and discussed in a new series of National Conferences scheduled during the last half of 1982 by the National Restaurant Association (NRA). The in-depth education forums are designed to encourage creative interaction between a broad spectrum of restaurant owners, managers, and executives and will feature outstanding lecturers and panel participants.

The *NRA National Conference on Human Resources in Foodservice* in Washington, DC, June 21-22, 1982, initiates the National Conference program. "Employee Relations - The Challenge for the 80's" is the theme for the conference which will be headquartered in the Quality Inn - Capitol Hill.

The *NRA National Conference on Purchasing*, in Chicago, IL, October 11-13, and the *NRA National Conference on Alcoholic Beverage Service*, in Dallas, TX, November 7-10, round out the 1982 National Conference schedule. Both programs will provide restaurateurs the opportunity to interact with a wide range of experts and tackle two subjects which will have a major impact on future restaurant development and profitability.

For more information contact: NRA Seminar Department, 311 First Street NW, Washington, DC 20001, or call 202-638-6100 or 800-424-5156.

Book Reviews

Rapid Methods and Automation in Microbiology, Richard C. Tilton, Ed., American Society for Microbiology, Publication Sales, 1913 I Street N.W., Washington, DC 20006. 316 pages, Cloth bond \$30.00.

In the last 10 to 15 years there have been extensive efforts to utilize the potential for automation and rapid methods in the dynamic, but some times traditional, field of microbiology. Perhaps, the area of microbiology that has made some advances and uses in automation and rapid methods has been the clinical microbiology area. However, rapid methods and automation are finding their way into other areas of microbiology. Dr. Paul A. Hartman mentions in his chapter (p. 199) that the use of rapid methods and automated techniques will increase in the "microbiology of each and every ecological niche."

Dr. Richard C. Tilton puts together in one volume (over 85 papers) the proceedings of the 3rd International Symposium of Rapid Methods and Automation of Microbiology, Washington, DC 26-29 May 1981. The meeting attracted approximately 1450 participants from all over the world. The meeting was not only multi-national but also interdisciplinary. The 3rd International Meeting was preceded by the 1st Symposium of 1973 in Stockholm, Sweden and the 2nd Symposium in Cambridge, England, 1976.

According to Dr. Tilton, the purpose of the symposium was two-fold. One, rapid and automated methodologies now routine were critically reviewed and second, the new, innovative, unique and unproven instruments and techniques were introduced to the world of microbiology. According to him, the goals were admirably achieved. Although the proceedings concentrate on clinical microbiology areas, there are various sections entitled "Hydrophobic Grid-Membrane Microbiology-Principles and Practice" and "Rapid Methods in Food Microbiology" of utmost importance to Food Scientists. In addition, many of the methods geared to the clinical microbiology areas have potential applications in food analysis.

The Hydrophobic Grid-Membrane Microbiology section discusses the theory and practice of the Hydrophobic Grid-Membrane Filter, its practical considerations for the filtration of foods, the ISO-GRID Hydrophobic Grid-Membrane Filter System, an enumeration of indicator organisms in food with the ISO-GRID Hydrophobic Grid-Membrane Filter method, automated Hydrophobic Grid-Membrane filter techniques for obtaining aerobic plate counts and fungal counts in foods, and Hydrophobic Grid-Membrane Filter and the detection of *Salmonella* organisms. All papers were

written by either Dr. Anthony N. Sharpe from the Bureau of Microbiological Hazards, Food Directorate, Health Protection Branch, Health and Welfare, Ottawa, Ontario, Canada or by QA Laboratories Limited, Toronto, Canada scientists. QA Laboratories Limited is the commercial manufacturer of the ISO-GRID Hydrophobic Grid-Membrane Filter System. The majority of the data presented in these papers has all been previously published in the *Journal of Food Protection, Applied and Environmental Microbiology*, and/or other microbiology journals. However, the editor brings in one volume the application of a new membrane filtration unit, as a rapid means of evaluating the microbiological quality of foods. In addition, the theory and the practical considerations of the Hydrophobic Grid-Membrane Filter for the enumeration of bacteria in foods is presented to the readers.

The section of Rapid Methods in Food Microbiology included an overview of the developments of miniaturized microbiological techniques, miniature methods in poultry microbiology, miniaturized methods and computer analysis in meat microbiology, adaptation of commercial systems for rapid identification of bacteria in foods, expanding horizons in miniaturized methods in food and water microbiology and the use of coagulation techniques in the rapid identification of microorganisms. Some of the work presented in the papers is the result of the efforts of Dr. Daniel Y.C. Fung and Paul A. Hartman in developing miniaturized microbiological techniques for their use in food microbiology. Much of the data presented in this section has been previously published in the *Journal of Food Protection, Applied and Environmental Microbiology* and/or other current microbiology journals. However, the editor brings together under one cover the state of the art in the use of rapid methods and commercially available kits for the identification of microorganisms in foods. Presently, the chapter discussing the coagglutination techniques for rapid identification of microorganisms has little food application. However, it is an area that deserves a lot of investigation because the potential of this procedure in food testing could be great indeed.

Currently, the book has limited application to the food industry; however, it brings the reader up-to-date in rapid and automated methodologies currently available world-wide for the recovery of microorganisms. The book should be a part of every university library, any faculty member involved in teaching food microbiology courses, and any food scientists interested in automation and rapid methods. The food industry and food sanitarian should wait until some of these rapid methods and automated techniques have been proven effective and the results of controlled studies are published in the

literature before they decide to select a rapid method or automated procedure in their specific food application.

Food microbiology is a sleeping giant in the use of automated and rapid methods systems. More and more research is currently being conducted as evidenced in this symposium and I foresee that in the 4th International Symposium (to be held 3 or 4 years later), the presentations and applications to food microbiology will increase dramatically. The \$30.00 price for the cloth bound edition of the book makes this book a very attractive book to food scientists and food microbiologists interested in rapid methods and automated systems in microbiology. We will then anxiously wait for the 4th International Symposium to hopefully present us, food microbiologists, greater food applications of these rapid methods and automated systems.

RICARDO J. ALVAREZ, Ph.D.

*Director of Quality Assurance
GIBCO Laboratories
Division of The Dexter Corporation
2801 Industrial Drive
Madison, WI 53713*

Principles of Design and Operation of Catering Equipment, AVI Publishing Company, West Port, Connecticut, USA, 440 pp. By A. Milson and D. Kirk.

PRINCIPLES OF DESIGN AND OPERATION OF CATERING EQUIPMENT is not a guide to the selection and operation of foodservice equipment. As its title implies this publication presents the principles underlying the design of catering equipment rather than serving as a guide to selection and operation. This text is definitely not written as an operational manual for catering equipment. The reader without a background and understanding of process engineering will not find this publication as a useful reference.

As the authors state in the preface this publication is intended to serve as an introduction to designing catering equipment for students with a background in process engineering. Catering equipment designers, manufacturers, and consultants will find PRINCIPLES OF DESIGN AND OPERATION OF CATERING EQUIPMENT to be a valuable reference. Schools of environmental science and engineering should consider using this publication as a text in a special problems or topics course. It would serve as an excellent introduction to an aspect of food science and sanitation that is often overlooked in many graduate schools.

As a practicing sanitarian I did not find many applied uses for this publication. However, I found it provided an

insight to the theory of common foodservice problems encountered by field sanitarians. For example: how does one calculate the thawing time for a steak or determine the time required for the center of a food pack to reach a specific temperature. For the individual with a need to know Milson and Kirk have the answer.

PRINCIPLES OF DESIGN AND OPERATION OF CATERING EQUIPMENT is a text written for the individual involved with the design rather than the operation of catering equipment. If more catering equipment were designed based on the principles presented in this publication there would probably be less operational problems experienced by those utilizing such equipment. This text should be available in graduate schools that offer courses in food science or food sanitation. It would be a useful reference for catering equipment manufacturers.

HOMER C. EMERY, Maj, MSC

*Academy of Health Science
Fort Sam Houston, TX*

Yersinia enterocolitica. Edward J. Bottone, Editor. CRC Press Inc., Boca Raton, FL. 1981. 224 pages. \$69.95.

As stated in the preface by Dr. Bottone the significance of *Yersinia enterocolitica* in foods is still debated as only one major outbreak, occurring in the United States, has been traced to contaminated chocolate milk. However, species of *Yersinia* are frequently recovered from food products without known production of disease. Dr. Bottone emphasizes that the nature of the *Yersinia* strains isolated in foods, and their control is a subject of great public health significance. Consequently, the correlation of the biochemical, serologic, and invasive potential of food isolates has added a new dimension in *Yersinia* research.

The book *Yersinia enterocolitica* brings to date (mid 1980's) all the research done on this organism by respected scientists. The book covers the classification, isolation techniques, antigens, antibiotic resistance, clinical observations, laboratory methods, gastroenteritis in children and their families, yersinia enteritis and Crohn's disease, arthritis associated yersiniosis, erythema nodosum associated with *Yersinia* infections, occurrence of antibodies of *Y. enterocolitica* in thyroid diseases, zoonotic infections (host range, transmission between animals and man), occurrence in foods, epidemiological aspects with reference to the New York State Outbreak, Canadian infections, South African isolates, and yersiniosis in Japan.

Although the book covers clinical, medical, epidemiological and foodborne properties of *Y. enterocolitica*, the book is of interest to food microbiologists, public health professionals and environmental sanitarians. The first three chapters cover the characteristics, biochemical properties and recovery of the organism from various samples. Chapter 15 (written by Drs. Lee, Vanderzant and Stern) covers the occurrence of *Y. enterocolitica* in foods. The authors discuss the prevalence of the organism in dairy, meats (beef, lamb, pork, poultry), seafoods and vegetable products. In addition, isolation procedures, survival, control and significance of this organism in foods is discussed. The last four chapters cover the prevalence of this organism in various countries.

The work presented in this book has not answered all the outstanding questions regarding this organism and the disease(s) it causes. However, it has brought into one volume the multiple aspects of this multifaceted human pathogen. The book is a very good reference book. However, the relatively high price should be the only deterrent to food microbiologists, sanitarians and public health professionals to add this book to their libraries.

RICARDO J. ALVAREZ, Ph.D.

*Director of Quality Assurance
GIBCO Laboratories
2801 Industrial Drive
Madison, WI 53713*

Metal Contamination of Food, Conor Reilly, 1980. Applied Science Publishers LTD. Essex, England. 235 pages.

Metal Contamination of Food, by Conor Reilly, is a valuable reference for the food scientist or student with an interest in contamination of foods by metals. The author not only provides a state-of-the-art treatment on the subject but also intersperses a wealth of observations of public health interest.

Reilly presents his text in a well organized manner. In part I, general and background information on metals is covered in four chapters. Chapter one, A Peck of Dirt, describes metals in the environment, the role of metals in the human body, and the general effects of metals in foods. Chapter two, How Metals Get into Foods, focuses on pathways by which metals are transported through the environment to foods. Pathways discussed include: soils, fertilizers, plant accumulation of metals, food processing, preparation activities, and storage. Chapter three, Quality Control, relates historical progress in enacting food safety legislation. This chapter not only covers quality control in the U.S. but also reviews control

activities in a number of countries and progress toward international food quality codification. The final chapter in part one, Analysis of Food, reviews analytical methods that are available for detecting metals in food products. Analytical methods are not described in exacting procedural steps, but enough information is presented to familiarize the reader with the methods that can be used.

Part two of *Metal Contamination of Food* is a comprehensive review of the major metals that have been found to contaminate food. The author provides essential information on the chemical and physical properties, production and uses, metabolism and biological effects and general methods of analysis for the following metals: lead, mercury, cadmium, arsenic, antimony, selenium, aluminum, tin, copper, iron, chromium, manganese, cobalt, nickel, molybdenum, titanium, vanadium, zinc, beryllium, strontium, and barium. The following metals are briefly discussed: boron, bismuth, zirconium, germanium, tungsten, tellurium, and thallium.

Reilly's introductory quote of an old English proverb, "Every man must eat a peck of dirt before he dies," sums up an important observation brought out by *Metal Contamination of Food*. Man is consuming increasing amounts of extraneous substances through food, metals being one of many. It is incumbent on all public health workers engaged in food sanitation and quality control to know as much about the health effects of these substances as possible. *Metal Contamination of Food* goes a long way toward furthering that knowledge.

This text is recommended for the food scientist, quality control professional, and regulatory officials. It should be available as a reference for students in schools of public health and environmental science. Conor Reilly has done an admirable job in presenting a worthwhile subject.

HOMER C. EMERY, M.A., M.S.C.

*Academy of Health Science
Fort Sam Houston, TX 78234*

School Foodservice, Second Edition. Dorothy Van Egmond-Pannell. AVI Publishing Company, Inc., Westport, Connecticut.

I found this book to be an excellent source of food service information including such topics as management practices, food purchase and preparation, nutrition and meal planning, and equipment needed to efficiently operate a school foodservice.

The author utilizes pictures, figures, and problems to reinforce the text. This is a strong point, since the author states that the "book endeavors to bring together much

of this information for the convenience of the students in correspondence courses, in vocational training courses, and in the colleges and universities and for all who want an understanding of school foodservice." To aid in this understanding, the book lists National School Lunch Act - Public Law 396, Child Nutrition Act of 1966, As Amended, and National School Lunch Act, As Amended in the appendices.

The food service industry is changing rapidly, due in part to product innovations, labor turnovers and operating costs. I do not know of any other book which contains as much up-to-date information about this rapidly changing area.

GENE LYON

*Research Food Technologist
Russell Research Center, USDA
Athens, Georgia 30613*

Food Hygiene in the Catering in Retail Trades.

John K. Davenport. H. K. Lewis and Company, Ltd., London, England. 214 pp. 1982. About \$19.00.

The author, an Environmental Health Officer, states that his book "is intended to provide factual information and practical advice to all who hold managerial or supervisory positions in the catering and retail food trades." Included in this group are line managers, supervisors, senior catering and retail staff, hygiene officers and students. Davenport points out that while "the law is important, and can set *minimum* standards, *good* standards will only be achieved when all understand the principles of food hygiene and are committed to putting them into practice."

In Chapter 1, entitled "An Introduction to Food Poisoning and Food Hygiene in Britain" the author reports that the first food hygiene regulations became operational in 1956 when the symptomless carrier was considered the greatest danger. Since only minor changes have been made in the law since that time, current regulations are preoccupied with conditions of the food handler, availability of hand washing facilities and

notices, no smoking signs, etc. He considers these things important but points out that apart from the elimination of food poisoning bacteria at the source (i.e. from raw food), good temperature control of protein foods is the one *single* factor most likely to contribute to a decrease in cases of food poisoning.

Because of the organizational approach, this book is rather unique in terms of foodservice sanitation books currently available. It brings together basic information that has been widely scattered in the past. The book is divided into two parts. Part I contains 8 chapters dealing with introductions to food poisoning, food hygiene and bacteriology, food poisoning agents, foodborne diseases and vehicles of infection, food premises (layout, construction, services and equipment, refrigeration, cleaning and disinfection, and pest control) and health education and hygiene incentive systems. Chapter 9, provides an introduction of Part II of the book by covering such topics as types of catering establishments, principles of catering design, food preparation and cooking - the dangers, cooking methods, cooking equipment, and washing-up. The remaining 6 chapters describe typical foods, practices and equipment used in catering premises identified as the licensed trade, takeaway food premises, grocery stores and supermarkets, butchery premises, wet fish shops, and food and drink vending machines.

In addition to a Table of Contents, the book contains a subject index with principal references shown in heavy type, a bibliography by topic area, and two appendices listing organizations concerned with food and food hygiene and a short trade directory of materials and equipment, 21 illustrations and 9 tables. Chapter 8 contains an annotated list of food hygiene courses and films and booklets for health education. Each Chapter is divided into several numbered sections; this contributes to ease of reading. Overall this book has "something for everyone," thus it would be an useful resource for students and practitioners involved in foodservice sanitation.

M. EILEEN MATTHEWS

*Department of Food Science
University of Wisconsin-Madison
Madison, WI 53706*

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Calendar

 1982

June through August---GORDON RESEARCH CONFERENCES, "Frontiers of Science", New Hampshire. Contact: Dr. Alexander M. Cruickshank, Director, Gordon Research Conferences, Pastore Chemical Laboratory, University of Rhode Island, Kingston, Rhode Island 02881, 401-783-4011 or 401-783-3372.

June 6-9---INTERNATIONAL FROZEN FOOD TRADE FAIR, Grosvenor House, London, England. For more information contact: Sharon Evans, Eagle Exhibition Consultants Ltd. 129-141 High St., Epping, Essex CM 16 4AG.

June 9---WAREHOUSE SANITATION SEMINAR FOR MANAGEMENT AND WAREHOUSE PERSONNEL, Albert Pick Motor Inn, Houston, Texas. Food Sanitation Institute, Jean Day, Coordinator, 1019 Highland Avenue, Largo, FL 33540.

June 10-11---CREATIVE MARKETING COMMUNICATIONS WORKSHOP for food and dairy equipment and supply companies. Chicago O'Hare/Kennedy Holiday Inn. For more information contact: Dairy and Food Industries Supply Association, 6245 Executive Blvd. Rockville, MD 20852, phone 301-984-1444.

June 12-16---85th ANNUAL CONFERENCE OF THE ASSOCIATION OF FOOD AND DRUG OFFICIALS. Hyannis Regency, Hyannis, MA, Cape Cod, hosted by the New England Food and Drug Officials Association. Contact: Eaton E. Smith, 23 Bevin Boulevard, East Hampton, CT 06424.

June 14-18---MINICOMPUTERS AND MICROPROCESSORS: INTERFACING APPLICATIONS FOR THE FOOD INDUSTRY. Course is limited to 20 students. For more information contact: University Extension, University of CA, Davis, CA 95616, phone 916-752-0880.

June 19-23---ANNUAL EDUCATIONAL CONFERENCE OF THE NATIONAL ENVIRONMENTAL HEALTH ASSOCIATION. New Orleans, Louisiana. Contact: Larry Krone, NEHA, 1200 Lincoln Street, Suite 704, Denver, Colorado 80203.

June 21-22---THE FIFTH NATIONAL FOOD POLICY CONFERENCE by The Community Nutrition Institute and the Food Marketing Institute. This year's conference is entitled, "New Challenges for Nutrition." For more information contact: Pat Kelly CNI, 1146 19th St., NW, Washington, DC 20036, phone 202-833-1730.

June 21-25---75th AIR POLLUTION CONTROL ASSOCIATION MEETING. New Orleans, Louisiana. Contact: APCA, P.O. Box 2861, Pittsburgh, PA. 15230.

June 22-25---IFT "FOOD EXPO," Las Vegas, NV. Contact: Dan E. Weber, Director of Marketing/Administration, IFT, 221 N. LaSalle St., Chicago, IL 60601.

June 23---SYMPOSIUM ON TERMINOLOGY: The cornerstone of Global Communications Through Standards. For more information contact: Wayne P. Ellis, H. B. Fuller Company, PO Box 625, Springhouse, PA 19477, phone 215-628-2600.

July 7-11---SOYFOODS EXPO 82, University of Washington, Seattle, WA. For more information contact: Soyfoods Comes West Director, Soyfoods Association, 100 Health Road, Colrain, MA 01340.

July 15-August 1---EUROPEAN DAIRY STUDY TOUR. For more information contact: Mr. Tony Nankervis, G&N Travel Service, "ACMAL House", 566 St., Kilda Rd., Melbourne 3004, Victoria, Australia.

July 20-24---HOSPITAL, INSTITUTION, AND EDUCATIONAL FOOD SERVICE SOCIETY (HIEFSS) is announcing the relocation of its 1982 Annual Meeting. The 22nd Annual Meeting and Exposition is at Stouffer's Inn On The Square in Cleveland, Ohio. This is a change in date, city and hotel. For more information contact: Carolyn Isch, 4410 West Roosevelt Road, Hillside, IL 60162, 312-449-2770.

Aug. 10-12---SOUTHERN REGION FOOD EDUCATIONAL WORKSHOP. Vanderbilt Holiday Inn, Nashville, Tennessee. Food Sanitation Institute, Jean Day, Coordinator, 1019 Highland Avenue, Largo, FL 33540.

Aug. 13---SANITATION THROUGH DESIGN: Vanderbilt Holiday Inn, Nashville, Tennessee. Food Sanitation Institute, Jean Day, Coordinator, 1019 Highland Avenue, Largo, FL 33540.

Aug. 22-26---IAMFES ANNUAL MEETING. Galt House, Louisville, KY. Contact: Earl Wright, IAMFES, PO Box 701, Ames, IA 50010, 515-232-6699.

Sept. 1-2---"PROSPECT FOR FOOD". The Summer Symposium of the Institute of Food Science and Technology will be held at the University of York and will be on the theme "Prospect of Food", dealing with aspects of nutrition, storage and raw materials. Details and registration forms available on request from: Dr. K. C. Yates, Hon. Secretary, IFST North of England Branch, Kelloggs Co., of Great Britain Limited, Park Road, Stretford, Manchester, M32 8RA.

Sept. 15-17---20th YANKEE CONFERENCE ON ENVIRONMENTAL HEALTH. Cromwell, Connecticut. Contact: Leon F. Vinci, P.O. Box 1300, Middletown, CT. 06457.

Sept. 15-18---3rd INTERNATIONAL CONGRESS OF THE NATURE INTERNATIONAL ACADEMY, Spoleto, Italy. For more information contact: Mrs. C. Rotoli Fucci, N.I.A. Via Enamuele Filiberto, 271 00185, Rome, Italy.

September 24---1982 FOCUS ON FOOD SCIENCE SYMPOSIUM IV. Kansas State University, Manhattan, KS. For more information contact: F. E. Cunningham.

October 13---IOWA ASSOCIATION OF MILK, FOOD AND ENVIRONMENTAL SANITARIANS FALL EDUCATION MEETING. Holiday Inn, Cedar Rapids, IA. For more information contact: Jack Schoop, 602 East 1st St., Des Moines, IA 50307, 515-286-3929.

 1983

August 6-11, 1983---IAMFES ANNUAL MEETING. Stouffers, St. Louis, MO.

Aug. 14-19, 1983---5th WORLD CONFERENCE ON ANIMAL PRODUCTION, Nihon Toshi Center, Tokyo, Japan. For more information contact: The 5th WCAP Conference Secretarial, c/o National Institute of Animal Industry, Tsukuba Norindanchi, PO Box 5, Ibaraki 305, Japan.

 1984

August 3-9, 1984---IAMFES ANNUAL MEETING, Edmonton, Alberta, CN.

3-A Sanitary Standards for Pneumatic Conveyors for Dry Milk and Dry Milk Products

Number 39-00

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

It is the purpose of the IAMFES, USPHS, and DIC in connection with the development of the 3-A Sanitary Standards program to allow and encourage full freedom for inventive genius or new developments. Pneumatic dry milk conveyor specifications heretofore or hereafter developed which so differ in design, material and construction, or otherwise, as not to conform to 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 pneumatic equipment used solely for conveying dry milk and dry milk products that is not an integral part of the dryer, commencing with the point at which the product enters the conveyor and ending at the point the product is discharged from the conveyor.

A.2

In order to conform with these 3-A Sanitary Standards, pneumatic dry milk conveyors shall comply with the following design, material and fabrication criteria.

B.

DEFINITIONS

B.1

Product: Shall mean the dry milk or dry milk product which is conveyed pneumatically in this equipment.

B.2

Dry Milk Conveyors: (Referred to hereinafter as "conveyors") Shall mean equipment in which product is conveyed pneumatically.

B.3

Air to be Heated: Shall mean conveying air which will be heated to a temperature of not less than 240°F. (116°C.).

B.4

Air Not to be Heated: Shall mean conveying air which will not be heated or will be heated to a temperature less than 240°F. (116°C) (See Appendix, Section E).

B.5

Product Contact Surfaces:

B.5.1

Shall mean all surfaces that are exposed to the product and surfaces from which liquids and/or solids may drain, drop or be drawn into the product.

B.5.2

Shall mean all surfaces in contact with air which is not to be heated prior to coming in contact with the product commencing at the discharge of the air filter and ending at the first downstream surface in contact with the product.

B.6

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

B.7

Mechanical Cleaning or Mechanically Cleaning: 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 (1) be of stainless steel of the AISI 300 series¹ or corresponding ACI² types (see Appendix, Section F.), or (2) metal which under conditions of intended use is at least as corrosion-resistant as stainless steel of the foregoing types and is non-toxic and non-absorbent, except that:

C.1.1

Rubber and rubber-like materials may be used for gaskets and flexible connectors.

C.1.2

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

¹The data for this series are contained in the following reference: 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., N.W., Washington, D.C. 20036.

²Alloy Casting Institute Division, Steel Founders' Society of America, 20611 Center Ridge Road, Rocky River, OH 44116.

³Aluminum Association, 420 Lexington Avenue, New York, NY 10017.

C.1.3

Plastic materials may be used in sight and/or light openings and for gaskets and flexible connectors.

C.1.4

Plastic materials when used for the above specified applications shall comply with the applicable provisions of the 3-A Standard for Plastic Materials, Number 20-12.

C.1.5

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

C.1.6

Cotton, linen, synthetic or silk materials may be used for flexible connectors. These materials shall be non-toxic, non shedding, relatively insoluble, easily cleanable, and shall not impart a flavor to the product.

C.1.7

Aluminum alloys conforming to the Aluminum Association³ designates 5052, 6061 and 6063 may be used as a dry product contact surface for dust covers, shields and parts having the same functional properties. These shall be removed prior to mechanical cleaning.

C.1.8

Glass may be used in sight and/or light openings and shall be of a clear heat resistant type.

C.1.9

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

C.2

Non-product contact surfaces shall be of corrosion-resistant materials or material that is rendered corrosion-resistant. If coated, the coating used shall adhere. Non-product contact surfaces shall be relatively non-absorbent, durable and cleanable. Parts removable for cleaning having both product 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

Permanent joints in metallic product contact surfaces shall be continuously welded. Welds shall be smooth and pit free, and where grinding and polishing is required, such areas shall be at least as smooth as a finish obtained with 80 grit silicon carbide. Intricate

fabricated and/or machined components shall be as smooth as a finish obtained with 80 grit silicon carbide, with welds pit free.

D.3

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

D.4

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

D.5

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

D.6

Conveyors that are to be mechanically cleaned shall be designed so that all product contact surfaces and all appurtenances not removed during cleaning can be mechanically cleaned and inspected. Parts removed for cleaning shall be readily removable and easily dismantled.

D.7

Product contact surfaces of conveyors not designed to be mechanically cleaned shall be easily accessible for cleaning and inspection either when in an assembled position or when removed. Parts removed for cleaning shall be readily removable and easily dismantled, except that blower wheels and fluidizer valves need only be readily accessible for cleaning and inspection.

D.8

Product contact surfaces intended for regular wet cleaning shall be self-draining or self-purging except for normal clingage.

D.9

Radii. Internal angles of 135° or less on product contact surfaces shall have radii of not less than 1/4 inch, except that:

D.9.1

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

D.9.2

The 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.9.3

Where smaller radii are required for essential functional reasons such as those on internal parts of mechanical collectors, collector systems and air lock blades. Where the radius must be less than 1/32 inch, the product contact surface of this angle must be readily accessible for cleaning and inspection.

D.10

There shall be no exposed threads or crevices on product contact surfaces except where required for functional and safety reasons such as fan and blower wheels, air lock valves, and fluidizer valves.

D.10.1

The parts for which an exception is made that have exposed threads or crevices on product contact surfaces shall be designed to be mechanically cleaned or shall be readily accessible for cleaning and inspection.

D.11

Sight and light openings, when provided, shall be of such design and construction that the inner surfaces drain inwardly; and if the conveyor is designed for mechanical cleaning, the inner surface of the glass or plastic shall be relatively flush with the inner surface of the conveyor. The exterior flare shall be pitched so that liquids cannot accumulate. The glass or plastic shall be readily removable. The inside diameter of the opening shall be at least 2 1/2 inches.

D.12

Bearings having a product contact surface shall be of a non-lubricated type. Lubricated bearings shall be located outside the product contact surface with at least 1 inch clearance between the bearing and any product contact surface. When a shaft passes through a product contact surface, the portion of the opening surrounding the shaft shall be protected to prevent the entrance of contaminants.

D.13

The design and construction shall be such that contaminants cannot enter the conveyor.

D.14

Flexible connections having product contact surfaces shall have straight sides without corrugations.

D.15

Supports: The means of supporting the conveyor shall provide a clearance between the lowest part of the conveyor, with the exception of legs, and the floor of at least 4 inches when the conveyor is not more than 25 inches wide or a clearance of at least 6 inches when the conveyor is more than 25 inches wide. An exception is made to these minimum clearances for conveyors that convey product from equipment supported directly on a floor. Conveyors supported directly on the floor shall be capable of being moved. Legs, if provided, shall be smooth, have no exposed threads and shall have rounded ends or be designed to permit sealing to the floor or other mounting surface. Legs made of hollow stock shall be sealed. Conveyors that are portable may be equipped with casters. Casters shall be easily cleanable, durable and of a size

that will permit easy movement of the conveyor.

D.16

Guards required by a safety standard that will not permit accessibility for cleaning and inspection when in place shall be designed so that they can be removed without the use of tools.

D.17

When a fan or blower furnished by the conveyor manufacturer as a part of a conveyor (1) is installed on the downstream side of the intake filter, it shall be designed and installed in a manner to preclude entrance of air contaminants and (2) if it is a part of a closed loop conveyor it shall be of a cleanable type.

D.18

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

D.19

Sanitary fittings shall conform to the applicable criteria in the 3-A Standard for Fittings, Number 08-17.

E.

AIR SUPPLY FOR CONVEYING PRODUCT

E.1

The air supply system and/or ducting should be such that all of the air is caused to pass through air filters properly installed before coming into contact with product contact surfaces of the conveying system.

E.1.1

Conveying air which will be heated before product contact should be passed through a properly installed and maintained filter(s), selected to have a minimum average efficiency of 90 per cent when tested in accordance with the ASHRAE Synthetic Dust Arrestance Test⁴ when operated at its design face velocity.

E.1.2

Conveying air which will not be heated before product contact should be passed through a properly installed and maintained filter(s), selected to have a minimum average efficiency of 85 per cent when tested in accordance with the ASHRAE Atmospheric Dust Spot Method⁴ when operated at its design face velocity.

APPENDIX

F.

STAINLESS STEEL MATERIALS

Stainless steel conforming to the applicable composition ranges established by AISI¹ for wrought products, or by ACI² 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 per cent. 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

⁴The method of making these tests will be found in the following reference: *Method of Testing Air Cleaning Devices, ASHRAE Standard 52-68. Available from the American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Inc., 345 E. 47th Street, New York, N.Y. 10017.*

CF-8M, respectively. These cast grades are covered by ASTM⁵ specifications A296-68 and A351-70.

G.

PRODUCT CONTACT SURFACE FINISH

Surface finish equivalent to 150 grit or better as obtained with silicon carbide, properly applied on

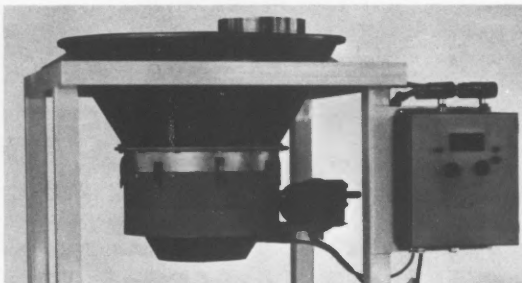
stainless steel sheets is considered in compliance with the requirements of Section D.1 herein.

These standards shall become effective September 3, 1982.

⁵Available from American Society for Testing and Materials, 1916 Race Street, Philadelphia, Pa. 19103.

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3-A Sanitary Standards for Bag Collectors for Dry Milk and Dry Milk Products

Number 40-00

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

It is the purpose of the IAMFES, USPHS, and DIC in connection with the development of the 3-A Sanitary Standards program to allow and encourage full freedom for inventive genius or new developments. Bag collector specifications heretofore or hereafter developed which so differ in design, material, fabrication, or otherwise, as not to conform to 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 bag collectors for dry cloth entrapment and collection of particulates of dry milk and dry milk products from air exhausted from a spray drying system, or an instantizing system beginning at the air inlets of the bag collector and terminating at the air exhaust and product outlets.

A.2

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

B.

DEFINITIONS

B.1

Product: Shall mean dry milk and dry milk product.

B.2

Bag: Shall mean filter media to serve as the entrapment medium in a stream of air containing suspended particulates.

B.3

Product Contact Surface: Shall mean all surfaces that are exposed to the product, or airborne product, terminating at the air filtering media, or from which liquids and/or solids may drain, drop, or be drawn into the product.

B.4

Mechanical Cleaning or Mechanically Cleaning: 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.

B.5

Exhaust Air Contact Surfaces: Shall mean the surfaces of the air ducts, plenum chamber(s) (if provided) and appurtenances from the final product contact surface and terminating at the air outlets.

B.6

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

C.

MATERIALS

C.1

All product contact surfaces shall be of stainless steel of the AISI 300 series¹ or corresponding ACI² 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 is non-toxic and non-absorbent, except that:

C.1.1

Aluminum alloys conforming to the Aluminum Association³ designates 5052 and 6061 and an Optional Aluminum Alloy conforming to the composition found in Appendix, Section G may be used (1) for venturi for air not to be heated and (2) as a product contact surface for dry product for star wheel rotors that are removed for cleaning, rotary air locks, diverter (flipper) valves, and a supporting or reinforcing member in lightweight moving parts.

C.1.2

Aluminum alloy conforming to the Aluminum Association³ designate A-360 may be used for construction of reverse jet venturi.

C.1.3

Rubber and rubber-like materials may be used for short flexible connectors and removable or bonded gaskets.

¹The data for this series are contained in the following reference: *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., N.W., Washington, D.C. 20036.

²Alloy Casting Institute Division, Steel Founders' Society of America, 20611 Center Ridge Rd., Rocky River, OH 44116.

³Aluminum Association, 420 Lexington Ave., New York, N.Y. 10017.

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 Standard for Rubber and Rubber-like Materials, Number 18-00.

C.1.5

Plastic materials may be used for short flexible connectors, removable or bonded gaskets, coatings (as provided for in Section C.2 and C.3 herein), filter media, and sight and/or light openings.

C.1.6

Plastic materials when used for the above specified applications shall comply with the applicable provisions of the 3-A Standard for Plastic Materials, Number 20-12.

C.1.7

Glass may be used in sight and/or light openings and when used shall be of a clear heat-resistant type.

C.1.8

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.1.9

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

C.1.10

Cotton, linen, silk, wool, or synthetic fibers may be used for separation of product from exhaust air. These materials shall be non-shedding, non-toxic, relatively insoluble, easily cleanable, and shall not impart a flavor to the product.

C.2

Exhaust air contact surfaces for bag collector systems which clean by air reversal, except for those of flexible connectors, fans, dampers and other mechanical parts shall be of stainless steel with no open chamber seams.

C.2.1

Exhaust air contact surfaces for bag collector systems which do not clean by air reversal shall be considered non-product contact surfaces.

C.3

Non-product contact surfaces shall be of corrosion-resistant material or material that is rendered corrosion-resistant. If coated, the coating used shall adhere. Non-product contact surfaces shall be relatively non-absorbent, durable and cleanable. Parts removable for cleaning having both product 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 F.)

D.2

Permanent joints in metallic product contact surfaces shall be continuously welded. Welds shall be smooth and pit free and shall be at least as smooth as a finish obtained with 80 grit silicon carbide. Intricate fabricated and/or machined components shall be as smooth as a finish obtained with 80 grit silicon carbide, with welds smooth and pit free.

D.3

Appurtenances having product contact surfaces shall be easily removable for cleaning, or shall be readily cleanable in place.

D.4

Product contact surfaces shall be easily accessible for cleaning and inspection either when in an assembled position or when removed. Removable parts shall be readily demountable.

D.4.1

Product contact surfaces and exhaust air contact surfaces not designed to be cleaned by hand shall be designed for mechanical cleaning.

D.5

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

D.6

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

D.7

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

D.8

Internal angles of 135° or less on product contact surfaces shall have radii of not less than 1/4 inch, except that:

D.8.1

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

D.8.2

The 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.8.3

Radii for fillets of welds in product contact surfaces where the thickness of one or both parts joined is 3/16 inch or less shall be not less than 1/8 inch.

D.8.4

Where smaller radii are required for essential functional reasons such as those on internal parts of mechanical collectors, collector systems, air lock blades, air distribution devices and conveying mechanisms, the radii shall not be less than 1/32 inch.

D.9

Means of access to inspect product contact surfaces shall be provided.

D.10

The inside dimension of a manhole opening, if provided, shall be not less than 15 inches by 20 inches if elliptical or 18 inches in diameter if round. The upper edge of a top manhole opening shall be not less than 3/8 inch higher than the surrounding area and if an exterior flange is incorporated in it, it shall slope and drain away from the opening. The sleeve or collar of a manhole opening for an inside swing-type of manhole cover shall be installed in a vertical position and pitched so that liquids cannot accumulate.

D.11

Sight and light openings may be provided.

D.12

Where air from a separate source is used for cleaning and/or purging, the air supply shall comply with the applicable criteria contained in 3-A Accepted Practices Number 604-03 for Air Under Pressure, or Number 607-03 for Spray Drying Systems.

D.13

Non-product contact surfaces shall have a smooth finish, be readily cleanable and those to be coated shall be effectively prepared for coating. Non-product contact surfaces shall be free of cracks and crevices. Insulation, if provided, shall be covered with a material conforming to the criteria in C.2 or C.3.

D.14

Exhaust air contact surfaces shall be accessible and readily cleanable. If no other means of easy access for cleaning is available, panels or doors shall be provided. They shall be constructed in a manner that will prevent the entrance of unfiltered air, and shall use hinges, wing nuts, latches and similar easy opening devices to allow easy access without special tools. Hinges shall be separable and readily cleanable. They shall not be of a continuous (piano) type.

D.15

When means are provided for conveying the product from the bag collector, the means shall comply with the applicable 3-A Sanitary Standards or Accepted Practices.

APPENDIX

E.

STAINLESS STEEL MATERIALS

Stainless steel conforming to the applicable composition ranges established by AISI¹ for wrought products, or by ACI² 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 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 ASTM⁴ specifications A296-68 and A351-70.

F.

PRODUCT CONTACT SURFACE FINISH

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

G.

OPTIONAL ALUMINUM ALLOY

An acceptable alloy is covered by Danish Standards DS #3002, and is designated #4261. Equivalent U.S. standards are designated ASTM B179 S12c, and Aluminum Association #C413.

H.

RECOMMENDATIONS FOR CLEANING BAG COLLECTORS

H.1

DRY CLEANING PROGRAM

H.1.1

Disassemble and thoroughly vacuum or dry brush clean all product contact surfaces of the bag collector. Reassemble as soon as finished and keep all parts dry.

H.1.2

Inspect bag cages, venturis and similar parts for their condition. Any necessary repair or replacement should be made as soon as possible.

H.1.3

Thoroughly clean all external parts of the bag collector.

H.2

WET CLEANING PROGRAM

H.2.1

Disassemble and remove all loose dry product. Then rinse all parts with clear water and follow with a thorough hand brushing of all parts using a general purpose cleanser. Rinse thoroughly to remove all cleaning solution or soil. It is recommended that hot water (170°F/77°C) or above be used for rinsing in order to sanitize the equipment and to promote drying.

Allow all parts to air dry completely prior to reassembly. Wet washing should be done as

¹Available from American Society for Testing and Materials, 1916 Race Street, Philadelphia, Pa. 19103.

necessary. After cleaning, drying and reassembly, all openings should be protected against recontamination.

H.3

GENERAL

H.3.1

Vacuum cleaning is preferred to brush cleaning or cleaning with air under pressure as it decreases dust drift to other areas of the plant.

H.3.2

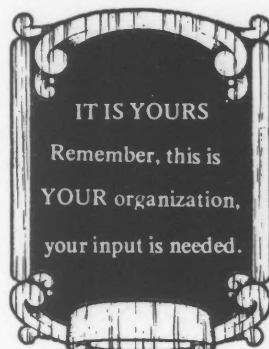
Brushes or vacuum cleaner fittings used for cleaning product contact surfaces should not be used for cleaning non-product contact surfaces or for other

uses which might result in contamination. Such tools should be made of materials that can be cleaned and sanitized and shall not have wooden parts nor be of mild steel or other iron products that will rust. Such brushes and special fittings should be stored in an enclosed cabinet when not in use. For protection and housekeeping considerations, such cabinets should be of non-wood construction and should have open mesh metal shelving.

These standards shall become effective September 3, 1982.

AFFILIATE NEWSLETTER . . .

This page has been devoted to YOU, the IAMFES affiliates. Your input is needed on whether you feel this page should be a regular feature to serve as a communication source between the state and international office. Please respond.



WHERE WERE THEY ... The IAMFES Annual Meetings began in 1937. Below is a partial listing beginning with 1937 as to the locations of the past annual meetings.

October 1937	Louisville, KY
October 1938	Cleveland, OH
October 1939	Jacksonville, FL
October 1940	New York City, NY
October 1941	Tulsa, OK
October 1942	St. Louis, MO
October 1943	Meeting cancelled due to World War II
October 1946	Atlantic City, NJ
October 1947	Milwaukee, WI
October 1948	Philadelphia, PA
October 1949	Columbus, OH
October 1950	Atlantic City, NJ
September 1951	Glenwood Springs, CO
September 1952	Minneapolis, MN
September 1953	East Lansing, MI
October 1954	Atlantic City, NJ
October 1955	Augusta, GA
September 1956	Seattle, WA
October 1957	Louisville, KY

Annual meetings from 1958 through the present will be printed next month!

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FROM INDIANA ... The 1982 Spring Meeting was held at Valle Vista, Greenwood, Indiana, April 21. A total of 137 registrants attended, including 37 students.

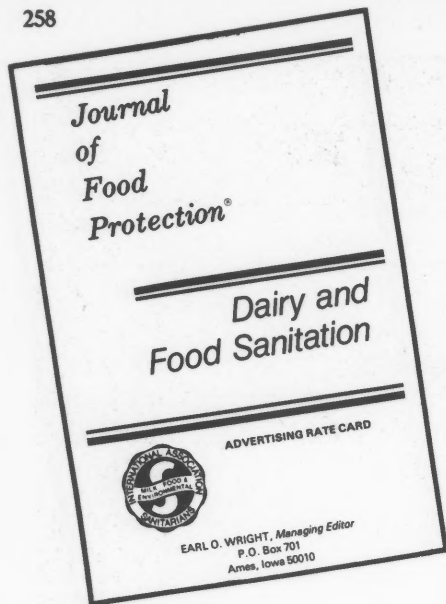
Alan Moberly, Assistant Chief of the Bureau of Environmental Health, Marion County Health Department, Indianapolis, Indiana, spoke on the theme of the meeting, "Surviving in the '80's", which presented to the audience strategies and methods which would help to increase accountability, efficiency, and productivity of health department staff and ways to obtain funding in times of tighter budgets.

Bruce Frost, of the Indiana State Board of Health Emergency Response Team, clarified the procedures to be followed by local health departments during chemical spills.

Dr. Joseph Yahner, Purdue University, talked about the latest research findings of the Purdue On-Site Waste Disposal Project.

After a buffet lunch, Dr. Ronald G. Blankenbaker, Indiana State Health Commissioner, spoke briefly about current and future finding for the state and local health departments and programs.

Completing the program was the spring business meeting of our Association, at which the candidates for state officers for the coming year were nominated, and other Association business discussed.



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Teaching, Research	9.70
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NOTE:

The 1977 recipient of the Sanitarian's Award was Harold Bengsch, Chief of Environmental Hygiene, Department of Public Health and Welfare, Springfield, MO.

This award was inadvertently omitted in the IAMFES History of the 70's by C. K. Johns in the March and April issues.

**IAMFES
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**See Page
21**

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JFP Abstracts

Abstracts of papers in the June Journal of Food Protection

Evaluation of Plating Media for Recovery of Heated *Clostridium perfringens* Spores, Ronald G. Labbe and Kirk E. Norris, Food Microbiology Laboratory, Department of Food Science & Nutrition and Agricultural Experiment Station, University of Massachusetts, Amherst, Massachusetts 01003

J. Food Prot. 45:686-688

Four selective and eight non-selective plating media were evaluated for their ability to enumerate six strains of heat-activated and heat-injured spores of *Clostridium perfringens*. Trypticase-sulfite-neomycin (TSN) agar and sulfite-polymyxin-sulfadiazine (SPS) agar gave higher counts of heat-activated spores than non-selective media. In the case of heat-injured spores, wide variation in recovery was obtained depending on strain and medium. Higher counts of heat-injured spores were obtained by incubating plates at 37°C than at 45°C, although, except for one strain, no significant difference between the two temperatures was observed using heat-activated spores.

Effects of Sodium Nitrite, Sodium Acid Pyrophosphate and Meat Formulation on Properties of Irradiated Frankfurters, R. N. Terrell, R. L. Swasdee, G. C. Smith, F. Heiligman, E. Wierbicki and Z. L. Carpenter, Meats and Muscle Biology Section, Department of Animal Science, Texas A & M University, Texas Agricultural Experiment Station, College Station, Texas 77843 and Food Engineering Laboratory, U.S. Army Natick Research and Development Command, Natick, Massachusetts

J. Food Prot. 45:689-694

Frankfurters of twelve treatment combinations were made using a conventional manufacturing procedure. Manufacturing treatments included formulations of either 60% pork/40% beef, 100% mechanically deboned chicken (MDC) or 100% mechanically deboned turkey (MDT); sodium nitrite levels of 0 or 50 ppm; and sodium acid pyrophosphate (SAPP) levels of 0 or 3,750 ppm. Finished frankfurters were either not irradiated or irradiated at temperatures of either -34.4 or -51.1°C and at a dose level of 0.8 or 3.2 Mrad. Addition of SAPP did not significantly affect external or internal color, off-flavor incidence or overall palatability of any of the frankfurters but significantly increased processing shrinkage for pork/beef and chicken frankfurters, decreased frankfurter pH values for pork/beef and chicken frankfurters and improved texture of pork/beef, chicken and turkey frankfurters. Addition of 50 ppm nitrite, as compared to use of no nitrite, significantly decreased processing shrinkage of turkey frankfurters, increased batter and frankfurter pH of pork/beef frankfurters, increased consumer cooking loss of chicken frankfurters but decreased consumer cooking loss of turkey frankfurters, decreased off-flavor of pork/beef, chicken and turkey frankfurters, and improved internal color of pork/beef, chicken and turkey frankfurters. An irradiation temperature of -51.1°C as compared

with -34.4°C, decreased off-flavor intensity and increased palatability of pork/beef frankfurters but did not affect other properties of pork/beef frankfurters or any of the properties of chicken or turkey frankfurters. Frankfurters irradiated with 0.8 Mrad differed ($P < 0.05$) from those that were not irradiated in only 3 of 18 sensory traits (including overall palatability of pork/beef frankfurters); frankfurters irradiated with 3.2 Mrad differed ($P < 0.05$) from those which were not irradiated in 8 of 18 sensory traits (including overall palatability of pork/beef, chicken and turkey frankfurters).

Survival of Bacteria in Food Cooked by Microwave Oven, Conventional Oven and Slow Cookers, John T. Fruin and Linda S. Guthertz, Toxicology Group, Letterman Army Institute of Research, Presidio of San Francisco, California 94129 and Medical Diseases Laboratory, California State Department of Public Health, Berkeley, California 94129

J. Food Prot. 45:695-698

To assess the destructive effect of different cookery methods on bacteria, strains of *Escherichia coli*, *Clostridium perfringens*, *Streptococcus faecalis* and *Staphylococcus aureus* were used to inoculate a meatloaf preparation. After inoculation, a sample was withdrawn for bacterial analysis and the remainder of the meatloaf was divided and cooked by microwave oven, conventional oven and slow cooker. The temperature of the meatloaf was recorded at various locations immediately after cooking to obtain minimum, maximum and mean temperatures for each loaf. Also, just after cooking, representative samples were taken and analyzed by conventional means for the specific bacteria and for total bacterial content. Survival percentages were calculated and plotted against temperature for each cooking method. Temperature variation within the loaf was greatest for those cooked with microwaves and smallest for those cooked by the slow method. For each bacterial strain and the total count, the destructive effect of cooking method was not different at the 0.05 level of significance.

Growth of Bacteria in Soy-Extended Ground Beef Stored at Three Temperatures, F. A. Draughon, C. C. Melton and J. B. Stansbury, Department of Food Technology, University of Tennessee, P.O. Box 1071, Knoxville, Tennessee 37901

J. Food Prot. 45:699-702

The objective of this study was to determine the influence of five separate levels of textured soy protein (TSP) on growth of psychrotrophs, mesophiles, coliforms, *Staphylococcus aureus*, and fecal streptococci in soy-extended ground beef stored at -16°, 0° and 6°C. Highly significant increases in psychrotroph and mesophile counts accompanied increased levels of soy at 0° and 6°C, but not at -16°C. Soy-extended beef samples containing 20 and 40% TSP spoiled one day faster at 6°C and four days sooner at 0°C than non-extended ground beef. No significant differences in coliform, fecal streptococci or *S. aureus* counts could be attributed to increasing levels of TSP in

extended ground beef at -16° , 0° or 6°C . Protein content did not vary significantly with TSP concentration; however, fat decreased as soy level increased. Moisture and carbohydrate-ash content increased significantly as soy level increased, as did pH which reached a maximum of 6.5.

Chemical and Biological Evaluation of Aflatoxin After Treatment with Sodium Hypochlorite, Sodium Hydroxide and Ammonium Hydroxide, Frances A. Draughon and Ernest A. Childs, Department of Food Technology and Science, University of Tennessee, Knoxville, Tennessee 37916

J. Food Prot. 45:703-706

Aflatoxin B_1 was mixed with eleven concentrations of sodium hydroxide, sodium hypochlorite and ammonium hydroxide. Aflatoxin was quantitated by fluorometric determination and toxicity of aflatoxin treated with NaOH and NH_4OH was evaluated by the brine shrimp assay. Detoxified aflatoxin B_1 was then screened for mutagenicity using the *Salmonella*/mammalian microsome mutagenicity test (Ames test). Sodium hydroxide, sodium hypochlorite and ammonium hydroxide reduced fluorescence by 92, 96, and 94%, respectively, at concentrations of 25, 11, and 875 mg per 50 g. A high negative correlation was observed between decrease in fluorescence and increase in survival of brine shrimp ($r = 0.88$) for aflatoxin treated with NaOH and NH_4OH . Equivalent amounts of aflatoxin B_1 (0.05 μg) and aflatoxin B_1 + detoxified B_1 (0.05 μg + 0.05 μg , respectively) were not significantly different ($P > 0.05$) in the number of revertants resulting in the Ames test. Therefore, aflatoxin B_1 in the presence of detoxified aflatoxin did not increase in mutagenicity.

Essential Elements in Unprocessed and Processed Frankfurters, N. G. Marriott, A. Lopez and H. L. Williams, Department of Food Science and Technology, Virginia Polytechnic Institute and State University, Blacksburg, Virginia 24061

J. Food Prot. 45:707-712

Content of 16 essential elements was determined in three kinds of frankfurters by atomic absorption spectrophotometry. The element content of frankfurter batter was compared with processed frankfurters. There were larger ($P < 0.05$) amounts of sodium in beef; cobalt, manganese and sodium in chicken; and manganese, potassium and sodium in meat frankfurters (beef and pork) after processing. Chicken samples contained less ($P < 0.05$) chloride and potassium after processing. All frankfurters studied were superior sources of iron and zinc and fair sources of potassium when compared to other foodstuffs. Element retention ranged from 80.9% to over 100%. Data suggest that processing had minimal effects on element loss.

Efficacy of Germicidal Hand Wash Agents in Hygienic Hand Disinfection¹, A. Z. Sheena and M. E. Stiles, Departments of Food Science, Foods and Nutrition and Microbiology, The University of Alberta, Edmonton, Alberta, Canada T6G 2M8

J. Food Prot. 45:713-720

The efficacy of hygienic hand wash procedures for food handlers using germicidal soaps and hand dips was studied by measuring changes in numbers of microorganisms released from hands before and after each of two successive 15-s treatments. Both hand rinse and finger tip imprint sampling techniques were used. The experiment consisted of two (6 x 6) Latin square designs, each including a non-germicidal soap control. Of the hand dip agents, including sodium hypochlorite (50 ppm available chlorine), iodophor (25 ppm available iodine) and a quaternary ammonium compound (QAC) (930 ppm benzalkonium chloride), only the QAC gave a statistically significant decrease in the number of bacteria released when tested by the finger imprint technique. This experiment included a bar soap containing 1.0% trichlorocarbonyl which gave results equivalent to the non-germicidal soap control. Of the hand wash agents, 4% chlorhexidine gluconate and iodophor (0.75% available iodine) resulted in significant decreases in numbers of bacteria released when tested by either sampling technique. Products containing Irgasan DP 300 (0.25% active ingredient at the use concentration), tribromo-salicylanilide (0.5%) and *para*-chloro-*meta*-xylenol (0.325%) were no better than the non-germicidal soap control under the conditions of this experiment. Identification of 3,591 aerobic isolates from finger imprint plates indicated that *Staphylococcus epidermidis* and *Micrococcus* spp. were the predominating organisms (85.3%) released from the hands.

Characterization of Germination of *Desulfotomaculum nigrificans* Spores, L. S. Donnelly and F. F. Busta, Department of Food Science and Nutrition, University of Minnesota, 1334 Eckles Avenue, St. Paul, Minnesota 55108

J. Food Prot. 45:721-728

Germination of spores of *Desulfotomaculum nigrificans* was studied by measuring reduction in numbers of heat-resistant units. Complete (>99.9%) germination was observed with heat-activated spores suspended in a combination of 1% soytone, 0.1% ferric citrate, 0.1% sodium metabisulfite ($\text{Na}_2\text{S}_2\text{O}_5$), and distilled water. In this medium spores germinated most rapidly at pH 6.0 - 8.0 when incubated at 55°C after the spores were exposed to a 15 - 20 min heat-shock at 100°C . Twelve amino acids triggered germination either together or individually only in the presence of ferric citrate and $\text{Na}_2\text{S}_2\text{O}_5$. No one amino acid as a germinant was superior to the others evaluated. Of nine carbohydrates examined (at 1% levels), fructose, ribose, and arabinose initiated germination individually in distilled water. Ferrous ion initiated germination whereas the ferric ion did not. Cu^{++} (10mM) initiated germination whereas Zn^{++} (10mM) inhibited germination. Phosphate buffer (67mM) and EDTA (10mM) inhibited cation-initiated germination. Reducing agents such as $\text{Na}_2\text{S}_2\text{O}_5$ may provide ferrous ions needed for spore germination. Ferrous ions as germinants indicate a possible significant role for an iron source when enumerating *D. nigrificans* spores or when evaluating food spoilage caused by *D. nigrificans*.

Effect of Mechanical Treatment, Fat Level and Chopping Time On The Texture of Comminuted Meatballs, F. Y. Wu

and H. W. Ockerman, Department of Animal Science, The Ohio State University, Columbus, Ohio 43210 and The Ohio Agricultural Research and Development Center, Wooster, Ohio 44691

J. Food Prot. 45:729-732

The effects of tumbling, fat levels and chopping times on the texture of comminuted meatballs were studied using pork sirloin with the addition of 2.5% salt and 0.25% polyphosphates. Hammering or tumbling 24 h increased ($P < .05$) the emulsifying capacity, emulsion stability and viscosity, but decreased the water holding capacity of the tissue. Holding the product for 24 h also resulted in a higher ($P < .05$) value for emulsifying capacity, emulsion stability and viscosity than holding for one hour or tumbling for one hour. No significant effect of treatments was found on the textural properties of the meatballs. Addition of 20% fat lowered ($P < .05$) the values of all textural measurements. In the no-fat-added group, 4 min of chopping time resulted in a greater texture score when measuring compressive strength, resilience, modulus of elasticity and shear strength; however, in the 20%-fat-added group, the values increased as the chopping time increased up to 6 min.

Evaluation of Retail and Palatability Characteristics of Electrically Stimulated U.S. Choice Beef After Commercial Transport-Distribution, R. R. Riley, J. W. Savell, D. M. Stiffler, J. G. Ehlers, C. Vanderzant and G. C. Smith, Meats and Muscle Biology Section, Department of Animal Science, Texas Agricultural Experiment Station, Texas A & M University, College Station, Texas 77843

J. Food Prot. 45:733-737

The left sides of U.S. Choice carcasses were electrically stimulated (ES) and the right sides were not (Not-ES); sides were transported to a retail distribution center, cut and packaged. Vacuum-packaged subprimal cuts (top round; outside round; full loin, trimmed; ribeye roll; chuck--blade portion; shoulder clod roast) were shipped to a retail store and cut into retail cuts. Weight loss of vacuum-packaged primals during storage did not differ ($P > 0.05$) between ES and Not-ES treatments for any of the six subprimal cuts. Muscle color of 7-bone roasts at the beginning of retail display was the only appearance characteristic improved ($P < 0.05$) for any steak or roast as a result of ES. No differences ($P > 0.05$) were observed between ES and Not-ES beef for muscle color, surface discoloration or overall appearance of top round or porterhouse steaks. ES did not ($P > 0.05$) affect the shrink loss of retail cuts at 2 or 3 days of display. Microbiological evaluations of ES and Not-ES retail cuts did not produce consistent results. Muscle fiber tenderness for sirloin steaks (*gluteus medius*) increased ($P < 0.05$) as a result of ES; however, ES resulted in higher ($P < 0.02$) shear force values for ribeye steaks (*longissimus*). Neither sensory panel ratings nor shear force values differed ($P > 0.05$) between treatments for bottom round roasts; however, shoulder pot roasts from ES sides had more detectable connective tissue ($P < 0.03$), less overall tenderness ($P < 0.008$) and less overall palatability ($P < 0.04$) than did shoulder pot roasts from Not-ES sides.

Changes in Chromatographic Profile of Anthocyanins of Red Onion During Extraction, A. B. Moore, F. J. Francis, and F. M. Clydesdale, Department of Food Science and Nutrition, Massachusetts Agricultural Experiment Station, University of Massachusetts, Amherst, Massachusetts 01003

J. Food Prot. 45:738-743

The role of acidifying agent in extracting anthocyanins from red onions was investigated. Cl^- of HCl disrupted complex structures present in onion tissue to release anthocyanins and also induced formation of other complexes containing the pigment. Formate did not produce these effects. A schematic was developed to illustrate the interaction and decomposition of anthocyanin fractions during HCl extraction. The implications of the presence of Cl^- in the extractant on interpretation of extraction results were discussed. Anthocyanins possibly acylated with non-cinnamic acids were considered to be particularly affected by mineral acids in the extractant.

Loss of Polymyxin B From Enrichment Broth for *Vibrio parahaemolyticus*, B. Blanchfield, S. Stavric, A. Jean and H. Pivnick, Bureau of Microbial Hazards, Food Directorate, Health Protection Branch, Health and Welfare Canada, Tunney's Pasture, Ottawa, Ontario, Canada K1A 0L2

J. Food Prot. 45:744-746

Polymyxin B sulfate (PB) added to salt broth (SB) for selective enrichment of *Vibrio parahaemolyticus* was destroyed by autoclaving. Losses were about 49% at pH 7.4 and 97% at pH 8.8. Additionally, certain raw fish when added to salt polymyxin broth (SPB) caused a loss of PB, probably due to adsorption; vertebrate fish (red snapper and herring) caused a loss of about 72% of PB, but shellfish (oyster and clam) did not cause any loss.

Simple Medium for Assessing Quantitative Production of Histamine by *Enterobacteriaceae*, Steve L. Taylor and Nancy A. Woychik, Food Research Institute, Department of Food Microbiology and Toxicology and Department of Food Science, University of Wisconsin, Madison, Wisconsin 53706

J. Food Prot. 45:747-751

A simple medium was developed for the quantitative assessment of the histamine-producing capability of *Enterobacteriaceae*. This medium was formulated from trypticase soy broth fortified with 2.0% histidine, pH 6.3 (TSBH). Histamine production by *Klebsiella pneumoniae* was optimal under those conditions and other histamine-producing bacteria, such as *Proteus morganii* and *Enterobacter aerogenes*, also produced large quantities of histamine in TSBH. TSBH is superior to tuna fish infusion broth for studies on bacterial histamine production because it is simple and inexpensive to prepare, has a consistent composition, and is not dependent on the

availability of high quality raw tuna. TSBH should be useful for studying the effectiveness of proposed methods for controlling bacterial histamine production. Histamine production by *K. pneumoniae* was reduced as the NaCl concentration of the TSBH was increased, with marked inhibition occurring at 5.5% NaCl.

Aflatoxin: Toxicity to Dairy Cattle and Occurrence in Milk and Milk Products - A Review, Rhona S. Applebaum, Robert E. Brackett, Dana W. Wiseman and Elmer H. Marth, Department of Food Science and the Food Research Institute, University of Wisconsin-Madison, Madison, Wisconsin 53706

J. Food Prot. 45:752-777

Aflatoxins are toxic and carcinogenic secondary metabolites produced by some common aspergilli during growth on feeds, foods or laboratory media. Aflatoxin B₁ (AFB₁) is a decaketide (C₂₀-polyketide) which is synthesized by the mold from acetate units via the polyketide pathway. Methionine contributes the methoxy-methyl group. Six known intermediate compounds in

the biosynthesis of AFB₁ include norsolorinic acid, averantin, averufin, versiconal hemiacetal acetate, versicolorin A and sterigmatocystin. Other aflatoxins (B₂, B_{2a}, G₁, G₂ and G_{2a}) appear to be conversion products of AFB₁. When aflatoxins, and in particular AFB₁, occur in feed and are consumed by dairy cattle, a variety of symptoms can occur, which includes unthriftiness, anorexia and decreased milk production. Changes in amounts of enzymes and other blood constituents also result from ingestion of AFB₁. The hepatic microsomal mixed-function oxidase system of the cow converts some of the ingested AFB₁ into aflatoxin M₁ (AFM₁), which is excreted in milk. AFM₁ retains the toxicity of, but is less carcinogenic than AFB₁. Certain heat treatments associated with milk processing appear to inactivate a portion of the AFM₁ in milk. If raw milk contains AFM₁, products (fluid products, nonfat dried milk, cultured milks, natural cheese, process cheese, butter) made from such milk also will contain AFM₁. AFM₁ appears to be associated with the casein fraction of milk, hence concentrating the casein in the manufacture of products (e.g. cheese, nonfat dry milk) is accompanied by concentrating of the AFM₁. Methods involving thin-layer or high-performance liquid chromatography are commonly used to detect and quantify AFM₁ in milk and milk products.

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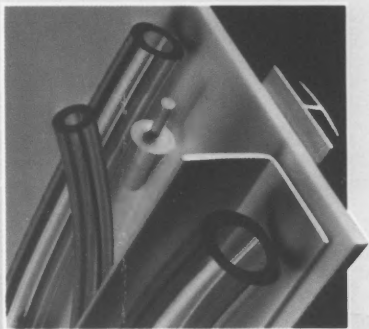
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