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Dairy and Food Sanitation

A Publication for Sanitarians and Fieldmen

- A Guide for the Production of Sediment-Free Milk
- The Development of Educational Programs for Sanitarians — Wisconsin's Story
- Milk Flavor and Quality
- Insect and Rodent Control in Food Establishments
- The Mysteries of Motivation

A Publication of the International Association of Milk, Food and Environmental Sanitarians, Inc.

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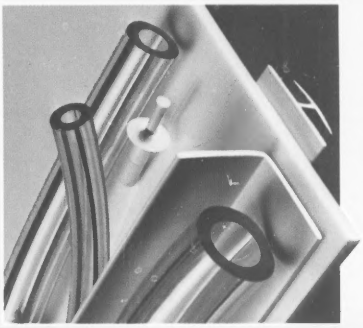

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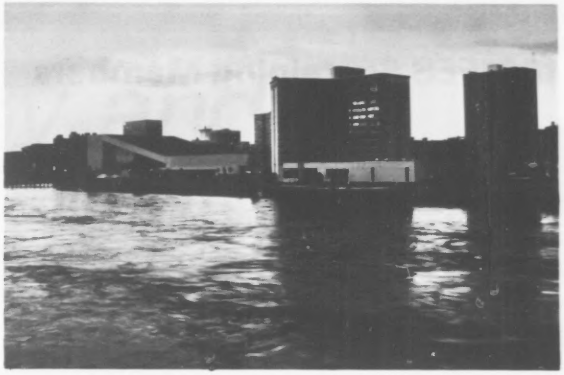

Welcome to Spokane, the capital of the Inland Empire. We hope that you'll come to the 68th Annual Meeting of IAMFES, August 9-13, 1981 at the Sheraton-Spokane Hotel, Spokane, WA. During the meeting a variety of events are planned, ranging from an ice cream social to a Salmon Barbeque at Riverfront Park, site of the 1974 World's Fair.
We'll see you in Spokane!

1981 IAMFES ANNUAL MEETING

Advance Registration Form for the 68th Annual Meeting, August 9-13, 1981, Spokane, WA

Mail to: Donald L. Kilgore, Registration Chairman
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Dairy and Food Division
North 222 Havana
Spokane, Washington 99202

Please check where applicable:

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Make checks payable to: IAMFES 1981 Meeting Fund

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Registration	$22.50	$10.00	$27.50	no chg.
Banquet	17.50	17.50	17.50	17.50
Salmon Barbeque	6.00	6.00	6.00	6.00
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Registration	$27.50	$13.00	$32.50	no chg.	$32.00
Banquet	20.00	20.00	20.00	20.00	20.00
Salmon Barbeque	7.50	7.50	7.50	7.50	7.50
Total	$55.00	$40.50	$60.00	$27.50	$60.00

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Dairy and Food Sanitation

February, 1981

The Development of Educational Programs for Sanitarians — Wisconsin's Story

JOHN B. GERBERICH and
CLARENCE K. LUCHTERHAND

Many health departments recognized the need for well-trained personnel as problems in environmental health were becoming more complex. Therefore the need for a person trained in environmental health has continued to rise in importance to command attention.

The Wisconsin Environmental Health Association set up a committee to study and develop a program to train individuals in the field of environmental health. The areas for study were set up by the committee. The ultimate purpose was to establish a need and demand. Scholarships were established in 1970. A curricula was first established at the University of Wisconsin - Eau Claire.

A Masters degree program is now part of the Division of Allied Health.

Prior to 1962, Wisconsin health officers, and administrators of environmental health programs felt there was a need for individuals on staff who had an adequate background in environmental health. One Wisconsin health department hired four sanitarians with BS degrees in biology and found it would take 3 to 4 years to train such individuals in environmental health, as being administered by that department. Other health officers with the same experience came to the Wisconsin Association of Sanitarians, now the Wisconsin Environmental Health Association (WEHA), asking them to set up a committee to study this situation and to develop a program to prepare individuals who were both interested and qualified to work in environmental health.

In the spring of 1962, the Wisconsin Environmental Health Association proposed that an educational committee be formed to begin a formal educational program as soon as possible.

Later in 1962, WEHA proposed that a Joint Committee on Education be established by representatives of the WEHA and Wisconsin Association of Milk and Food Sanitarians (WMFS) since educational objectives of both organizations were to improve the professional sanitarian's image.

Following preliminary research between the associations, the idea of a joint educational committee between the associations was proposed at the annual WMFS meeting with a favorable reaction.

The Joint Committee on Education of the WEHA and the WMFS was eventually composed of C. K. Luchterhand, Chairman; Evert Wallenfelt, Roy Clary, Paul Neubauer, K. G. Weckel, S. E. Wittwer, Edward R. Friday, and Dan Jendra.

In 1963, the Joint Committee on Education met to determine what would be needed to train an environmental health sanitarian and to improve his professional stature.

The following areas were established for study:

1. Salary scales and opportunities offered to well-qualified sanitarians.
2. Training necessary.
3. Curricula adequate at present levels and training which needed to be developed.
4. Possibilities for developing better incentives and concerned officials who could be contacted in local governments.
5. Need, statewide, to promote the sanitarian's image.
6. Survey of Universities offering a B.S. degree in the Sanitary Sciences.

The ultimate purpose was to establish the need and demand for the educational programs for environmental sanitarians.

From this meeting a survey was prepared and sent out to all health officers in the state concerning the problems they faced in finding qualified environmental health sanitarians. The health officers were also asked to indicate if such qualified personnel were available, and what opportunities were

present, as well as what expected professional futures were for such individuals.

The Joint Educational Committee then established an AD Hoc Committee to study the possibilities of developing a formal program in environmental health.

Many replies to the committee's letters and research of universities who had environmental science curricula were discouraging citing problems such as: many universities experienced difficulties in establishing curricula in the applied sciences; costs of establishing new programs with small enrollments were prohibitive, and the lack of professional groups to promote recruitment was a barrier. Other reactions obtained were that there was an absence of academic leadership to develop interdisciplinary programs; relatively little concern was given by academic staff to outside professional groups in new program development; outside professional groups received scant attention from the university when they were without a well-acquainted faculty member who might deal with attitudes, reactions and policies.

Therefore, it was concluded that basic to development of such a program, there had to be a common, mutual relationship between the outside professional group and staff members within the academic community.

A survey of the registered sanitarians in Wisconsin was conducted. Many universities throughout the state were contacted about their interest in developing a curriculum for environmental sanitarians.

The Joint Committee on Education studied the results of the survey and on March 8, 1965, a report of its findings established a number of the schools offered courses leading to a degree in environmental health science, or included such courses in the established curricula.

However, it was startling that the number of students pursuing these courses was very low. The only conclusion which could be drawn was that there is a strong lack of incentive. The sanitarian's image appeared very hazy and unattractive.

However, it was startling that the number of students pursuing these courses was very low. The only conclusion which could be drawn was that there is a strong lack of incentive. The sanitarian's image appeared very hazy and unattractive.

In 1966, at the meeting of the Joint Committee on Education reactions from the survey of health officers revealed a need for well-trained sanitarians, but that such officers were not in a position to offer salaries required to attract the type of person needed.

Based on surveys conducted among all registered sanitarians and administrators of local and state regulatory agencies, the committee found there were more new sanitarians entering the field, the educational background of the sanitarians varied greatly, there was a need for an organized set of refresher courses, and the field of sanitation had changed from specialization to cover all phases of general environmental sanitation. Therefore, the Joint Committee on Education concluded that there definitely was a need to establish an environmental health curriculum at one of the Wisconsin universities.

Later in 1966, committee members C. K. Luchterhand, and John Bacharach, met with Dr. Richard Hibbard, Vice Chancellor of Academic Affairs, University of Wisconsin - Eau Claire, and Dr. John B. Gerberich, Chairman, Division of Allied Health Professions, University of Wisconsin - Eau Claire, to explore the idea of establishing a curriculum for environmental sanitarians. The meeting brought out facts that proved to be of interest to both parties and it was decided that the University would discuss the idea among various university departments. If interest developed, the University staff would have members of the Joint Committee on Education present the problem to the Curriculum Committee and other interested academic members of the School of Arts and Science.

Favorable interest arose in several departments and the Joint Committee on Education was invited to appear before the Curriculum Committee and other staff members of the School of Arts and Science in October, 1966. The meeting developed a mutual understanding of the problem and encouraged the development of a trial curriculum for a degree program. Within several months, the program met with approval of the University of Wisconsin - Eau Claire and the Joint Committee.

Between that meeting and April, 1967, the Allied Health Advisory Committee met a number of times to structure the degree program.

In April, 1967, several members of the Joint Committee met in Eau Claire with the Allied Health Advisory Committee to finish the proposed degree program for a Bachelor's degree in Environmental and Public Health.

The degree program was presented in

April 1967 to the Curriculum Committee of the School of Arts and Science, and in September to the faculty of the School. The University Senate heard of the program in October and the Board of Regents in December, 1967. Finally the program was approved by the Coordinating Council on Higher Education in February, 1968.

At this point, the Joint Committee had achieved one of its three objectives. In early 1967, the Ad Hoc Committee began work on a second objective, that of improving the image of the sanitarian. The committee studied methods of educating the public as to what an Environmental Health Sanitarian is, does, and the public's need of the sanitarian in an environmentally-oriented society. The University of Wisconsin - Eau Claire, in conjunction with the Ad Hoc Committee, printed brochures, developed films for radio and TV spots, mailed out a film for use by high school guidance counselors. District Sanitarian officers of the two professional Associations visited high school career days. The Ad Hoc Committee continues to work in various career and professional service clubs to explain why they are proud to be sanitarians. These activities have become a continuous effort of all Registered Sanitarians in Wisconsin.

At the Joint Education Committee meeting in September, 1969, additional objectives were discussed: 1) continuing education for the professional sanitarian and 2) establishing scholarships for junior students in the degree program. Scholarships help to promote the image of the sanitarian to the high school student, college students, as well as the general public. The Ad Hoc Committee suggested to the Joint Committee on Education that it recommend that each association establish an award on alternate years a $300 scholarship to a junior student in the Environmental and Public Health curriculum at the University of Wisconsin - Eau Claire.

The Committee began study also of the problem of continuing education for the professional sanitarian. The committee distributed a questionnaire among registered sanitarians to discover areas of interest for continuing education. The committee also attempted to identify already available programs offered by Federal and state governments as well as commercial and university sources.

After a year of collecting information, the Ad Hoc Committee reached the following conclusions:

1) State and local health agencies could not afford to send more than a few individuals to the various educational programs
2) Budgets for education were small
3) Time away from regular positions created some staffing problems
4) Individuals who were able to attend programs did little to share information with 'job bound' personnel
5) Most courses were "one-shot" learning experiences which created a fragmented type of educational program
6) The Center for Disease Control has "Home Study Courses" which showed sequencing possibilities. The CDC was contacted and after review of the courses, the committee felt that they offered some use.

Then in June, 1972, the Ad Hoc Committee on Education invited state agency personnel directors to discuss establishing a sequence of courses, to be taught by university staff in different locations in Wisconsin, for university credit. The Departments of Agriculture, Health and Social Services, and local health units expressed interest in the proposal.

The Ad Hoc Committee reported to the Joint Educational Committee on the results of their continuing education study. The Joint Committee accepted the report.

A request was made to the Allied Health Advisory Committee and the UW - Eau Claire administration that a continuing education course sequence for professional sanitarians be established. Permission was granted to secure an agreement with the CDC, then to establish the curriculum and present it to the Joint Committee on Education.

Once accepted by the Committee, it was presented to the Curriculum Committee of the School of Arts and Science. The courses eventually became part of the curricula of the Division of Allied Health Professions of the University of Wisconsin - Eau Claire.

Among courses approved for Continuing Education of Professional Environmental Health Sanitarians were Community Hygiene, Foodborne Disease Control, Waterborne Disease Control, Vectorborne Disease Control, Communicable Disease Control, and Basic Math.

Once the B.S. degree in Environmental and Public Health and the continuing education programs were implemented, the Joint Committee on Education of the two sanitarian groups began studying the last goal, that of a masters degree program in Environmental and Public Health. This program has been developed and is part of the Division of Allied Health.

Dairy and Food Sanitation

The new IAMFES magazine, *Dairy and Food Sanitation* addresses many of the same concerns as does the *Journal of Food Protection. Dairy and Food Sanitation*, however, provides articles of immediate interest and application to the work of the practicing sanitarian, fieldman, and quality control person.

As such, it complements the scientific *Journal of Food Protection,* which continues to offer the latest research in milk and food sanitation and technology.

In addition to articles, *Dairy and Food Sanitation* contains departments formerly included in the *Journal*, but they're expanded in the new magazine to offer readers more complete information about news, events, and others in the field. Among the expanded departments are news about IAMFES affiliate members, meetings, and events; Association events; new product news; excerpts from such publications as the Center for Disease Control's "Morbidity and Mortality Weekly Report," and the Federal Register. New 3A and E-3A Sanitary Standards and amendments to existing standards are also included in *Dairy and Food Sanitation.*

Regular publication of *Dairy and Food Sanitation* begins with the January, 1981 issue. Give the portion below to a colleague who might like to receive *Dairy and Food Sanitation*, or to request additional information about IAMFES and the *Journal of Food Protection.*

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Milk Flavor and Quality- As I Find It

"In most states no one in the regulatory or educational area checks to determine the quality and flavor of dairy products, as consumers purchase them."

SIDNEY E. BARNARD

Professor of Food Science Extension
The Pennsylvania State University

The quality and flavor of both raw and fluid milk is an often discussed, and always important subject for the dairy industry.

In most states no one in the regulatory or educational area checks to determine the quality and flavor of dairy products, as consumers purchase them. Only in New York state have large number of samples been evaluated as in Pennsylvania. In no state will the situation be better than in Pennsylvania. This statement is made after having checked samples from more than 15 states. However, if no one looks, no one will find problems. But this does not mean the problems don't exist. Purchase 1,000 samples from stores in a year, in any state, and evaluate them. You will receive an unpleasant shock, where quality and flavor are concerned.

Look at results for 1979 compared with previous years and trends of the quality and flavor of fluid milk become obvious. In Pennsylvania, 1,045 samples were purchased for a survey. The samples represented 196 processing plants, 86 of which were dealers and 110, farm juggers.

The numbers of samples were about two-to-one in favor of those from dealers versus those from farm juggers. The quality and flavor results were very similar. If anything, samples from farm juggers were slightly better. However, they should be, because the milk was fresher.

The entire dairy industry should be complimented for the excellent bacterial quality of most of these samples. Certainly consumers can be assured that they are getting safe dairy products.

Presented at the
Joint Conference of Pennsylvania Dairy Fieldmen and Approved Dairy Laboratory Directors, June 2-5, 1980 University Park, PA.

More than 80% of the samples had bacteria counts which met standards for fresh milk, even though the open dated samples averaged six days old since processing. The flavor picture - well, it was not so good.

The coliform summary looks very good. Nearly three-fourths of all samples are free of coliforms, regardless of age. Those samples with more than 10 coliforms per ml are usually high, with a few hundred or a few thousand colonies.

The same situation is true for SPC's, with more than 80% of samples having counts of fewer than 10,000 per ml, and only 13% having counts above 20,000 per ml. Again, most of these were very high, in the hundreds of thousands or millions per ml.

Regulatory agencies have adopted requirements which have helped improve quality, but sometimes have contributed to off-flavors. The temperature of milk in stores has improved to the point where there are few storage-related problems. Fewer than one of every 10 stores holds milk in the dairy case above 45°F. Nearly 50% of stores keep milk at the ideal temperature, 40°F or lower.

The flavor problem would seem to be getting worse, but seldom is it the result of bacterial spoilage. Tasting standards have not changed but 10% of samples had an objectionable flavor twelve years ago, while the rate is now about 50%.

Feed and strong cooked flavors used to be major problems. Strong silage flavors are noted in milk from individual farms, but not often in mixed herd milk. Very few plants still use vat pasteurization, hence the reason for no strong cooked flavors. That leaves two chemically developed flavor problems and one which may be caused by bacterial growth as well as other conditions.

The causes of unclean or occasionally spoiled flavors are sanitation problems on farms or in plants. Prevention means regular and complete cleaning and sanitizing of all milk contact surfaces and prevention of contamination until milk is put into its final container. Milk must be kept cold, should be processed within 48 hours of every-other-day collection from

farms and should be used by consumers within 10 days of processing. Milk is a perishable product, even when handled properly.

The primary causes of the two chemically developed flavors are light exposure for an oxidized flavor and too much agitation and holding too long for a rancid flavor. The solutions are not always simple or easy and sometimes drastic action is necessary.

Dairy sanitarians can do at least two things to prevent these problems. First make any farm visit relating to a flavor problem to include observation of the milking routine. Look at the equipment before milking, but observe milking and the transfer and cooling of milk. You'll always find one or more reasons for the rancid, oxidized or unclean flavor.

Sanitarians should also review lactation and breeding records, and note feeding practices. Frequently one of the solutions for an oxidized flavor is to feed supplemental vitamin E. An increase of protein in the ration provides resistance to rancid flavor development.

The rancid flavor problem peaked in 1978 when 34% of all samples were rancid, and rancidity accounted for 58% of objectionable flavor samples. During the first five months of 1980 only 18% of all samples were rancid, but of objectionable samples, 55% were rancid.

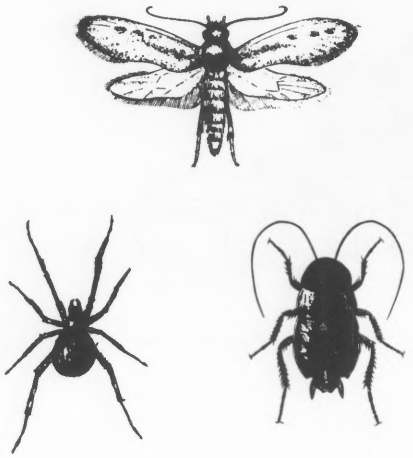
The quickest and easiest way to determine rancidity is by tasting rather than any scientific test.

Rancidity starts at the cow. The way that milk is moved, cooled and held determine flavor. Rancidity can successfully be corrected and prevented by concentrating on raw milk quality from the cow to the pasteurizer.

To improve milk flavor as consumers buy and drink it:

1. Adopt a monthly Preliminary Incubation Count (PIC) program for all loads and all individual farms. Set a standard of 20,000 per ml as an ideal. Get IMS and state regulations changed to permit PIC's in lieu of Standard Plate Counts with the regulatory maximum remaining at 100,000 per ml.
2. Collect all milk from every farm on an every-other-day basis. Pasteurize it within 48 hours of farm collection. Empty raw milk storage tanks every processing day before adding fresh milk. If necessary, make this a regulation.
3. Concentrate inspection on farms and plants which have had problems over the years. Both industry and regulatory sanitarians know which ones these are. Apply whatever pressure is necessary and as a last resort, stop farms from shipping and plants from processing. Spend time where it will do the most good. Many times this means something other than 8:00 AM to 5:00 PM hours.
4. Stop the introduction of new containers which permit light penetration and more oxidized flavor. Containers of clear glass are not satisfactorily replaced by clear plastic. Use instead white pigmented or yellow tinted containers which block almost 100% of the light rays which cause off-flavors and nutrient loss.
5. Continue open dating of a reasonable length, whether nine, ten or twelve days. Extend the limit only when processors demonstrate that milk will be of good quality flavor at the end of the dating limit. Use dark colored paper containers to block out light rays.
6. Put more emphasis by regulatory agencies and distributors on temperature, rotation and light exposure conditions of milk in stores, schools and food service operations. Regulatory sanitarians should check store purchased samples of all brands at least twice a year. Try to go to different stores in a variety of cities and towns. Encourage places which sell milk to convert to closed dairy cases with minimum light exposure when they purchase new equipment.

The goal remains the same - to provide good quality, good flavor dairy products for all consumers.



Insect and Rodent Control in Food Establishments

Presented at the:
Sixty - Seventh Annual Meeting
International Association of
Milk, Food and Environmental Sanitarians, Inc.
Milwaukee, Wisconsin
July 29, 1980

RICHARD W. GILLESPIE

Training Officer
State Training Branch
U.S. Food and Drug Administration
Department of Health and Human Services

Control of insects that destroy or contaminate the food supply is the interest of the FDA, as well as other regulatory agencies. The Food, Drug and Cosmetic Act, referred to as the "Pure Food and Drug Act," works to protect the public from food which was or may have been exposed to unsanitary conditions. The relationship of insects and rodents to the spread of disease, basic elements of insect and rodent control, suspension of pesticides, pest control operator certification, pesticide application methods, and the responsibilities of the food sanitarian and foodservice unit management are discussed.

Food Sanitation and Filth

The Food, Drug and Cosmetic Act is often referred to as the "Pure Food and Drug Act." This emphasizes one of its basic purposes, the protection of the consuming public from food that may be deleterious, unclean, decomposed, or that has been exposed to unsanitary conditions which may contaminate it with filth or render it injurious to health. Filth includes such contaminating elements as rat and mouse hairs and excreta, whole insects, insect parts and excreta, maggots, larvae and parasitic worms. The presence of such filth renders foods adulterated, whether or not danger to health can be shown.

Relationship of Insects and Rodents to the spread of Disease

The FDA is interested in control of all insects and rodents that destroy or contaminate the food supply. The relatively few insects and rodents which spread disease through food are the ones primarily concerned with, along with stored food insects which create damaged and wasted food. These include rodents, flies, cockroaches and small moths and beetles. Insects and rodents carry disease bacteria internally and on their hairy bodies. A fly is known to carry as many as 6 million microorganisms on its body and many more internally, all of which may be deposited on food and food surfaces by excreta. In order to prevent outbreaks of foodborne illness the chain of infection or contamination must be broken. Good practices of washing and sanitizing hands by employees, proper cleaning and sanitizing of utensils and food contact surfaces, proper storage of dishes and utensils and good refrigeration practices, as well as time and temperature controls in food handling, can all be wasted if insects and rodents are allowed to contaminate foods and food contact surfaces. It is expected that any food establishment may have an occasional insect or rodent problem, but it is the continual presence of these pests that causes the major problem and indicates a lack of good sanitation and control measures.

Basic Elements of Insect and Rodent control

No single measure will effectively control insects and rodents in food establishments. However, when all elements of control are summarized, two remain in the forefront. These two are not separate and distinct, but an integral part of each other. The two elements are:

Basic environmental sanitation. This includes proper refuse and garbage removal, to prevent harborage for insects or rodent breeding. Bulk containers can best be cleaned using steam. The storage area for garbage and refuse should be kept clean, and free from spillage. Refuse and garbage should be properly stored and picked up at least twice a week in order to break up the fly life cycle. All unwanted materials that might provide food or shelter should be eliminated. This means storing garbage and rubbish in approved containers with tight fitting lids (plastic bags won't keep out rodents). Lumber and other materials should be stacked 18 inches off the ground. Food set out for dogs, rabbits, pigeons or chickens is often a source of food for insects and rodents, and should be policed by picking up scraps of leftover food, and keeping dog dishes clean. Animal droppings should be cleaned up around dog pens.

Animal droppings, spilled feed and other such sources of breeding material need to be picked up promptly.

Scrupulous cleaning of floors and tables should be a routine practice.

Doors and windows should be screened and in good repair to keep flies out of the food establishment. It's easier to keep flies out, to keep them from breeding than it is to deal with them after they are grown.

Doors should be self-closing and where fly fans are used, screen doors should be provided, as fans may not always be running.

Insect and rodent stoppage consists of changing structural details to eliminate openings 1/2 inch or larger which would admit rats, and 1/4 inch or larger which allow mice to enter. Where only Norway rats are found, usually only first floor stoppage work is economically feasible, even then only at likely points of entry and every possible opening such as around doors, windows, where pipes and conduits enter building, floor drains, transoms, letter drops, fan openings, and foundations. Concrete, brick and mortar as well as galvanized hardware cloth, and galvanized metal are some of the materials needed for ratproofing. Where Roof rats are encountered, ratproofing must include wires, vertical pipes and openings to upper floors and roofs.

Methods of fly control which are not routinely recommended are electrocution screens, fly traps, air screens and curtains.

Toilet facilities should be kept clean with self closers on the doors.

Good sanitation includes frequent cleaning of shelves and floors. Stored grain insects thrive on flour, meal and cereal products that are spilled on the floor.

Keep dry food storage clean and cool. The cool temperatures inhibit growth and reduce egg laying.

Examine all incoming stock for signs of infestation.

Isolate infested products from the rest of stock until ready to dispose of it.

Rotate stock using a code or numbering system.

All open packages or sacks should either be used immediately or stored in covered containers.

Foods should be stored a minimum of 6 to 8 inches off the floor. This increases speed and ease of handling products with mechanical forklift trucks, as well as good ventilation. When the area is kept clean, it discourages insect and rodent infestation and affords an area for inspection to pick up early infestations. It is recommended that aisles a minimum of 2 feet wide be provided along walls, through the center and elsewhere depending on the size of the storage area.

Rodent traps are useful around food establishments where rodenticides are not permitted and where only slight infestations are predicted. Two main types exist.

Live Traps (0 Traps) used for catching live rats for study purposes.

Killer Traps (Snap Traps)

A third type (cage trap) is used for collecting live rats. Traps must be maintained by checking frequently, at least once every 24 hours.

Cockroach Attractant Traps can detect low level populations, locate problem areas, monitor populations and reduce slight infestations.

Effective chemical control. This should be used in conjunction with good environmental sanitation. Chemicals or pesticides should be used to control insects and rodents which gain entrance to the premises, whether in the building or on the property.

Chemicals such as commercially prepared fly sprays, cords, and baits should be used in strict accordance with instructions. Vapona strips (gardona) are not to be used in food establishments where there is any possibility of overhead contamination into food. They may be used in the garbage area. Continuous insecticide vaporizers cannot be used where food is stored, prepared or served. Where insect or rodent problems cannot be controlled with sanitation and minimum chemical use, it is advisable to employ a licensed pest control operator.

Pesticides have saved millions of lives by controlling disease-carrying insects and rodents. But pesticides are poisonous chemicals and when improperly used can endanger humans and animals.

Federal regulations establish general and specific standards that a user must meet before applying pesticides. For requirements in a particular area, state and local agencies should be contacted.

Authority

The Federal Environmental Pesticide Control Act of 1972 (FEPCA) substantially amends the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) of 1947. The Act recognized that pesticides are beneficial and necessary, and that risks regarding hazards to man and animal have increased with pesticide usage increase.

The Environmental Protection Agency (EPA) has the authority to administer the FEPCA. It establishes tolerance levels on food and feed while the FDA enforces tolerance levels on processed foods. The USDA enforces tolerance levels on raw agricultural commodities.

Registration, Cancellation and Suspension of Pesticides

All pesticides shipped in interstate commerce must be registered with EPA. Before registration, the manufacturer is required to provide scientific evidence that the product under use conditions would be effective and would not injure humans, crops, livestocks, wildlife and/or damage the environment; that directed use would not result in illegal residues on food or feed. A pesticide registration can be cancelled if it is determined that the directed use of the pesticide poses a serious hazard to man or the environment.

A suspension of a pesticide can stop interstate shipments immediately, but can only be initiated when the product presents an imminent hazard.

The Pesticide Label is a Legal Document and Should Display:

Brand, Trade and Product Name

Active and Inactive Ingredients
Use Directions
Warnings
EPA Registration Number
Establishment Number
Name of Manufacturer
Net Weight

Pesticide Classification — Restricted or General Use

Restricted pesticides can only be used by certified applicators. The states will certify pesticide applicators for restricted pesticides. General use pesticides can be used by all persons, but use instructions on the label must be followed.

Pest Control Operator Certification

Most states are actively involved in getting pest control operators (PCO) certified. Generally, certification encompasses a minimum of seven hours classroom training covering the law, methods, techniques, and safety.

Pesticide manufacturing plants must be registered with EPA and the registration number must appear on the labels of company products.

The FEPCA was signed by the President September 30, 1978 and one of its key amendments is to permit certain uses of pesticides for pests not specifically mentioned on the label, provided the following are met:

There is reason to believe it will work.
The label does not specifically prohibit use for that pest.
The pesticide is applied to a site described on the label.

Insecticides, Application Methods in Food Establishments

Authority. In August 1973 EPA published a definition and policy statement in the Federal Register. It defined the status of every insecticide that could be used in food areas of food establishments. This permitted the use of 16 residual type insecticides. Since October 1974 only those which bear label directions on their labels for such use may be used.

Definitions. Food is defined by FDA and EPA as: 1) articles used for food or drink for man or other animals, 2) chewing gum and 3) articles used for components of any such article.

Food Handling Establishment - an area or place other than a private residence in which food is held, processed, prepared and/or served.

Food Area - includes areas for receiving, serving, storage, packing and preparing food.

Non-Food Area - includes garbage rooms, lavatories, entries, and vestibules, offices, locker rooms, machine rooms, boiler room, garages and mop closets.

Residual Applications

General. Application to broad expanses of surfaces such as walls, floors and ceilings are permitted only in non-food areas.

Spot. Application to limited areas where insects are likely to be but which will not be in contact with food or utensils. These areas may be floors, walls, ceilings or undersides of equipment. A "spot" will not exceed two square feet. Until recently, this application could be used only in non-food areas, but EPA has permitted spot treatment in food areas with certain insecticides. The label on the insecticide container should indicate whether spot treatment is permitted in food areas.

Crack and Crevice. Application of small amounts of insecticides into cracks and crevices in which insects hide or through which they may enter a building. This is the method of choice for applying insecticides in food operations. The treatment includes the use of sprays, dusts, or baits.

A special nozzle (to give a fine pin stream) is used to get the insecticide into the cracks and crevices. Most crack and crevice treatments will be made using liquid formulations. Three things done by a pest control operator will indicate proper treatment.

- Few placements should be made applying a minimum insecticide at each placement. No insecticide should be visible on a surface.
- When applying with a needle nozzle it should be placed into the crack or crevice, if possible, and not from any distance. The closer to the crack and crevice, the better.
- Even the best applicator will get some spray onto an exposed surface. A rag should be used to wipe up such excess.

Responsibilities of Food Sanitarian

He or she should know enough about those insects and rodents common to food establishments so that he can:

Recognize an insect or rodent problem if one exists.
Know what the problem is - the type of insect or rodent, where problem is, and to what extent.
Recognize and be aware of hazardous insecticides and poor application practices.

Responsibilities of Management

To operate a clean, safe food operation that provides good, wholesome, disease-free food.

To follow rules and regulations relating to good food operations and to make any corrections in equipment, operation or building as required.

To assure that each food service employee is adequately trained in good food handling practices.

To see that all incoming food and supplies are inspected for filth, sanitation and damage.

The control of insects and rodents in food establishments is not unreasonable or impossible. A good sanitation program including pest control techniques can yield satisfactory results.

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Book Review

Safety of Foods. Second Edition. Horace D. Graham. AVI Publishing Company, Inc., Westport, CT. 1980, 774 pages.

In the preface of the second edition, Horace D. Graham acknowledges that since the publications of the Proceedings of the International Symposium on the "Importance and Safety of Foods" held in Mayaguez, Puerto Rico, in 1967. (First Edition, *Safety of Foods,* 1968) many developments in fields involving the safety of foods have taken place. In addition, consumer interest and awareness toward food has increased during the last decade. In the first edition there were nine editors and seven sections. Almost every chapter included a Spanish summary. Revision of this twelve-year-old Proceedings was not accomplished by another conference, but by transforming the conference proceedings into a text.

Indeed a transformation was achieved. The second edition of *Safety of Foods* contains twenty-four chapters, it is not divided into sections, there are no Spanish summaries, and there are no chapters relating to food safety problems in Latin American countries. Eleven chapters are written by authors who did not attend the original conference, four chapters are written by new co-authors or by some change in the group of authors. Only one chapter remained written by the same author and eight new chapters were included (*Salmonella* Food Poisoning, J. H. Litchfield; Viruses in Foods, R. Di Girolamo; Control of Food Borne Diseases, F. L. Bryan; Nitrosamines, N. P. Sen; Mercury in Foods, R. L. Bradley and A. G. Hugunen; Trace Metal Problems with Industrial Waste Materials Applied to Vegetable Producing Soils, G. S. Stoewsand; Polychlorinated Biphenyls and Polybrominated Biphenyls in Foods, M. E. Zabik; and Safety of Food Service Delivery Systems in Schools, J. S. Avens). The changes in authors and the topics discussed covering many of the aspects that are involved in the safety and wholesomeness of foods, make this second edition a much stronger publication than the first. Many of the chapters are followed by a number of references, some as recent as 1978.

Graham states in the preface to the second edition that the text is intended to serve students of food science and technology, both undergraduate and graduate, as well as instructors in courses covering food toxicology and food safety. The second edition of the *Safety of Foods* will achieve just this purpose. It will supplement the textbooks that are currently available covering specific areas of food safety and toxicology. The wealth of information contained in each chapter, covering a wide range of subjects, will also aid instructors of introductory food science courses. However, the overall content of the book is too shallow to be used as a textbook for food safety or food toxicology courses.

This book should find its way onto shelves of individuals (workers in the food industry, regulatory agencies, public health workers, administrators and university personnel) who have a professional interest in the safety and wholesomeness of foods. In addition, it should be included in university, industry and food science and technology department libraries. The editor is deserving of congratulations for producing a quality reference textbook.

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The Mysteries of Motivation

There is a lot more to motivation than the fabled carrot and stick, especially at a time when workers have become more assertive. In thinking about how to motivate the people of today, a few concepts out of the past might not go amiss . . .

Motivation is a word that is commonly associated with big business, mainly because the management scientists who deal in the subject are usually employed or consulted by large corporations. This is regrettable in that it tends to blur recognition of a force that has a profound influence on the internal workings of organizations of all kinds from the United Nations to the corner store. Whether in a business big or small, a school, or an association, anyone who is responsible for other people's efforts must grapple with the intricacies of motivation. Therefore anyone who is, or aspires to be, responsible for other people's work should seek a basic understanding of what it is all about.

On the surface, it could hardly be simpler. To motivate people, the dictionaries tell us, is to cause them to act in a certain way. This is done by furnishing them with a motive to do your bidding. By the strictest definition, the most elementary form of motivation would be if a hold-up man were to stick a pistol in your face and growl: "Your money or your life." He instantly arouses a motive in you for doing what he wants you to — the motive of staying alive.

But motivation, in the popular understanding of the term, is usually a more long-lasting condition. You might, for example, train a puppy by motivating it to avoid a smack. Children will learn that "being bad" in the eyes of their parents will provoke a spanking, while "being good" will get them a treat of some sort. The parents have instilled in them the dual motive of avoiding punishment and earning rewards.

In the lexicon of management science, the system of reward and punishment is known as the "carrot-and-stick" approach, the carrot being dangled in front of a donkey's nose and the stick applied smartly to his hindquarters. In this fashion he is alternately enticed and impelled towards his master's goal. Whether the donkey ever gets to eat the carrot in this analogy is not made clear in management literature. We can be sure, however, that he gets to feel the stick.

Low-level motivators equal low-level effort

The carrot and stick were traditionally cited as the prime motivators of the "economic man", a mythical creature much used and abused by classical economists to further their theories of human dynamics. "The beauty of the economic man was that we knew exactly what he was after," the philosopher Alfred North Whitehead once wistfully wrote. He was a timorous specimen, terrified of taking a chance on being deprived of a living. At the same time he was instinctively greedy, forever grasping for as much money and property as he could possibly acquire.

In 1939 Peter Drucker, who has been hailed as the father of modern management science, published a book called *The End of Economic Man*, stating that economic self-interest was never as mighty a force in human affairs as the classical economists imagined. "We know nothing about motivation. All we can do is write books about it," the same Dr. Drucker recently said. This may be stretching a point to the limit, but Drucker's message is essentially valid. It emphasizes just how complex and inscrutable are the motives of the real flesh-and-blood man and woman working today.

The modern worker clearly is motivated by much more than the carrot of pay and advancement and the stick of discipline and insecurity, although it would be foolish to underestimate the continuing effectiveness of these devices. Money might not be everything — otherwise movie stars would be the happiest people on earth — but there is no evidence that the mass of

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humanity has ceased to have a strong desire for the comfort and possessions that money will buy. The "stick", at the very least, is what makes us get up in the morning and go to work even when we don't much feel like it. It is part of normal human nature to steer clear of trouble and to want the assurance of a steady, well paid job.

Many management experts, however, classify job and financial security as "low-level" motivators which guarantee no more than low-level effort. "To get people to do mediocre work, one need only *drive them*, using coercive and reward power in a manipulative way," writes James J. Cribben in his book *Effective Managerial Leadership*, published by the American Management Association in 1971. "To elicit their top performance, one must get them to *drive themselves*. . ."

From this statement it is clear that the function of motivation in modern management is to move workers to perform at the very peak of their abilities. Hence a conscientious manager should concentrate on creating and maintaining a psychological climate which enables people to do their level best.

As the title of Dr. Cribben's book implies, this can only be done through leadership. A leader is able to draw forth a willing effort from his followers and make them want to do their utmost for him. The antithesis of leadership is dictatorship, in which an unwilling effort is forced out of people by the crude application of power. An involuntary effort is likely to be less effective than one given voluntarily. And it should be borne in mind that dictatorships invariably produce rebels devoted to their demise.

It's not the satisfaction that drives, but the desire

Theories abound about how leaders should go about getting people to drive themselves, but no one disputes the fundamental notion that "high-level" motivation resulting in high-level performance must come from within an individual. It is the sum of a person's aspirations, values, self-esteem and sensibilities. So it is a person's own property, to be given or withheld depending on how he or she feels about a job.

It can, however, be given unconsciously if working conditions correspond with the needs that dwell within a person's psyche. In his classic work *Motivation and Personality*, A. H. Maslow divided the range of a normal person's needs into five broad categories which have to do with basic creature comfort, security, the social instinct, ego gratification, and living up to one's image of oneself. Maslow pointed out that the satisfaction of these needs should not be mistaken for motivation; rather it is the drive to obtain or sustain the satisfaction. When you consider that some of the most dedicated people in history have been motivated by storing up rewards in heaven, you can see his point.

The first three categories are easy enough to understand. People naturally want the necessities of life; they want comfortable and secure working conditions and fair compensation; they want to feel that they belong to a group of supportive people and be part of something bigger than themselves.

The needs that come under the heading of ego gratification are more difficult to fathom. They involve a desire for recognition, status, and opportunities to demonstrate extraordinary competence. In practice these needs may not be readily apparent to the individual worker's boss.

When people motivate each other, the working climate becomes ideal

A person's "self-actualization" needs may also be overlooked: these call for challenges to one's abilities, opportunities to exercise creativity, and a degree of personal autonomy. Obviously, neither these nor ego gratification needs can be met exclusively within the working environment. Still, they can have a strong effect for good or ill on a person's attitude towards a job.

No one has an entirely equal complement of Maslow's five varieties of needs. Whether a worker cares more about money than ego gratification, or more about self-expression than creature comforts, depend very largely on his or her temperament and background. Also, the intensity of one need or another within an individual will vary according to circumstances. To take the plainest examples, people become more preoccupied with security as they grow older.

All of which means that any attempt to motivate a person to do his or her best work be tailor-made to the needs of the individual personality. Because of this, the person most responsible for a person's motivation on the job is his or her immediate boss.

The top management of an organization can go some way towards meeting creature comfort and security needs, and in offering incentives for good performance. But the more private and particular elements of motivation must be dealt with on a personal level between the superior and subordinate day-by-day.

Some managers and supervisors will draw the line at this point, protesting that they are not psychiatrists or wet nurses, and that they have far more practical and pressing matters to worry about. But the fact is that they cannot escape the influence of motivation, or of its opposite, demotivation. The motivation of each individual in a work team is what goes to make up its morale — and bad morale can spell grief to the leader of any team.

The results of surveys of workers' attitudes in recent years underline the importance of motivation on the ground level. They show that present-day employees place a strong emphasis on challenge, opportunity, and recognition of performance;

and that they are more willing than their counterparts of a generation ago to quit a job that does not offer these things. An old-line manager or supervisor might write them off as spoiled brats or prima donnas. But by failing to take account of their personal priorities, he or she could very well have to live with the consequences of a high turnover, which include having to function on a more or less permanent basis with a half-trained staff.

On the other hand, bosses who make a serious effort to understand their subordinates become better-motivated themselves, because they come closer to fulfilling their own ego and self-expression needs in the process. Motivation must, in fact, work two ways, because superiors must be open to their subordinates' influence if they expect the subordinates to be open to theirs. The cross-motivation that comes from healthy superior-subordinate relationships gives rise to an ideal working climate, not only for the people directly concerned, but for the organization as a whole.

In other words, cross-motivation keeps everybody happy. And when we get right down to the core of the matter, that is what motivation is all about. The philosopher William James identified its nucleus long before the term ever entered the vocabulary. He wrote: "If we were to ask to question, 'What is life's chief concern?' one of the answers we should receive would be: 'It is happiness.' How to gain, how to keep, how to recover happiness is in fact the secret motive of all we do, and all we are willing to endure."

The boss's own happiness may depend on how his people feel

A line manager or foreman may consider it ridiculously beyond his purview to have to worry about whether the people working under him are happy or not. But in the long run — unless he is sadistic or masochistic or both — his own happiness in his job is bound to be affected by how they feel.

Only a positive effort to make them contented in their work will bring the kind of motivation that ensures he exceeds his objectives and boosts his organization's productivity. The most successful leaders are always those who pay most attention to the people who follow them. If a leader cares about what happens to his followers, his followers will care about what happens to him.

The shop floor or the office may not seem like the appropriate place to spread happiness, but work is certainly an element in the state of a person's emotions. Some people hate their jobs, and are to be pitied for it; most, however, are relatively satisfied with their work if only for the money it brings. Even people who regard work as a necessary evil will admit on close questioning that their work and all that is associated with it affords them a measure of happiness that they might not otherwise experience. Psychologists stress that work is a major source of self-esteem.

If a person's work *per se* adds to his or her happiness, then the job in itself becomes the ultimate motivator. But for this to be so, the work must be valued, and recognized as such. For the manager or supervisor, this implies a continuing effort to accentuate the importance of what the subordinate is doing in the overall context of the organization. It is noteworthy in this regard that the most fiendish punishments the military mind can devise entail having a prisoner do something entirely useless, like scrubbing his cell floor with a toothbrush or painting a pile of rocks.

The principles can be stated in simple, old-fashioned terms

There are various ways to build motivation into a job which may be found in the voluminous literature on the subject. Anyone seriously interested in motivation should, of course, refer to the books that have been written about it, which are too numerous to mention here. Writings on motivation tend to suffer from the professional jargon which psychologists and management experts employ in their attempts to be explicit. The principles can, however, be stated in quite ordinary

First of all, motivation is a matter of human understanding — of the superior understanding the subordinate. If and when that state is achieved, it becomes a process of encouraging people to go as far as possible towards meeting their aspirations — in plainer language, their hopes and dreams. This requires giving them an opportunity to show what they can do. Their efforts must then be recognized and rewarded to the extent that this is possible within the system. They must be made to feel wanted within that system. This is done by making them aware of how their efforts contribute to the whole.

It comes down to treating people with respect for their individuality and consideration for their feelings. It means caring about others — about their personal well-being. It means giving them a chance to show what they can do even if that is sometimes inconvenient. It means encouraging and helping them to meet their full potential in their careers.

When you think about it, motivation is not much different from friendship. A friend attempts to understand you, and to help you as far as possible to achieve your aims. A friend is concerned about your happiness, and tries within the limits of his or her ability to make you happy. A friend is someone who supports you and knows that he or she can count on your support in return.

Above all, a friend is someone who will go out of his or her way to do things for you. The motive for this is nothing more than the knowledge that you would do the same for him or her. And so it is with mutual motivation in the plant or office. The bosses who are most concerned about their subordinates get the most out of them in the form of high-quality work.

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A GUIDE FOR THE PRODUCTION OF SEDIMENT-FREE MILK

B. A. PERRY
The Kendall Company, Boston, MA 02101

Dairymen must help insure a good quality product to support their industry. Good nutrition for the cow aids in production of higher quality milk. Six sources of off-flavor milk are: physical condition of the cow, feed, absorption of odors, milk decomposition, foreign material, chemical deterioration. There are many factors involved in appropriate filtration of milk at the farm for production of good quality, sediment-free milk.

PROVIDING THE CONSUMER WITH NATURE'S MOST NEARLY PERFECT FOOD

Have you ever wondered why children just home from school raid the refrigerator for that tall glass of cold milk or heaping bowl of ice cream? Or why, when making a sandwich, they make sure to include butter or fresh cheese? Perhaps they know of the high nutrient value of dairy products, or perhaps it's just because of the good fresh flavor of modern dairy products.

From the time a baby is born and throughout his life, even into his later years, milk products are an essential part of his diet. Without question, milk provides nutrition needed to build a strong body and bones. And it is every dairyman's responsibility to produce the best milk possible.

The history of milk production shows clearly that milk has improved over the years. Today's consumer is more aware of nutrition and value and demands that the product he or she buys is of the highest quality possible. When this quality slips, the dairy industry stands a good chance of losing that customer to an imitation product, one which cannot offer the nutrition or value of good dairy products. What can the dairyman do to insure that the milk he sells is of the quality expected? Quality starts at the farm and a few guidelines help insure that the milk sold meets the highest standards demanded.

MILK DEFINED

Milk is the normal lacteal secretion of mammary glands. It is designed as a food for the young mammal. Thousands of years ago, man learned of the possibilities of milk and milk products, as food not only for the young, but for adults. Through selection and breeding, man has greatly increased the milk producing capabilities of those animals best adapted as a source of milk.

The chemical composition of milk essentially is an emulsion of fat and a watery solution of lactose, mineral salts, and a colloidal dispersion of protein. A typical sample of milk, if analyzed, would reveal the following composition:

Water 87.25%
Total Solids 12.75%

Total Solids-Fat 3.8%
Protein 3.5%
Lactose 4.8%
Ash 0.65%

Certain terms are used with the above constituents. Milkfat refers to the fat in milk. Protein, lactose, and ash (or salt) of milks, are termed "milk solids not-fat." The milkfat and milk solids not-fat are commonly designated as total solids. Milkfat is the most variable milk constituent.

INFLUENCE OF ENVIRONMENT ON MILK COMPOSITION

Various environmental conditions can affect milk composition. The specific ration or level of nutrition the cow is fed can significantly affect milk composition. If it is obvious that a dairy cow does not receive the correct amount of carbohydrates or protein, this will have an impact on the carbohydrate level (lactose) found in the milk. Conversely, if an animal is fed a well-balanced ration with ample amounts of carbohydrates and protein, the animal will produce milk with higher fat and protein levels. The percentage of fat and protein in milk will also vary between cattle breeds. Other environmental factors that affect milk composition are stress to the cow, such as weather, and various management practices.

THE DAIRYMAN'S INFLUENCE ON MILK COMPOSITION

Because the dairyman can alter the ration or select and breed dairy animals to meet certain objectives, he can indirectly influence the milk composition. The dairyman should strive to maintain the proper nutrient balance for the dairy herd to insure maximum production of the best quality milk.

Dairymen should be cautious as they change feeds from one season to the next to insure the proper balance of vitamins, protein, and carbohydrates in the feed.

If a dairyman is not conscious of these facts, he can affect milk composition adversely, which will change the grade of the milk he is producing for market.

MILK PROPERTIES

An intelligent observer, examining milk for the first time, would note these characteristics of milk:

Milk ranges in color from a bluish white to an almost golden yellow, depending on the breed of the cattle, the amount of fat and solids and, to a large extent, upon the type of feed consumed by the cow. In large quantities, milk appears entirely opaque, while in thin layers, it is somewhat transparent. Milk from which the fat has been removed or that is naturally very low in fat and other solids shows a bluish-white tint.

Milk has no pronounced flavor, but is slightly sweet to most people. Any pronounced flavor is atypical or abnormal. Freshly drawn milk has a characteristic, but not very pronounced, odor which is quite volatile and which

disappears when the milk is exposed to the atmosphere. Milk exhibits a pH value of 6.6 which indicates that it is somewhat acidic.

Water is a carrier or dispersion medium for milk constituents. Water serves as a continuous phase of liquid in which the solid constituents are dispersed. The specific gravity of commingled milk, from various herds, averages 1.032.

TASTE AND ODOR

Normal, freshly drawn milk has a slightly sweet taste and a characteristic, though slight odor. This odor generally disappears when milk is stored a few hours or following cooling and aeration. Milk's pleasing flavor is due to a high lactose content and relatively low chloride level. A low lactose and a high chloride content usually leads to a milk with an objectionable, salty flavor. Near the end of a cow's lactation, milk often has a salty taste.

Six sources of milk off-flavors are:

1. From the cow, due to a disturbed physical condition. In this instance the substances responsible for the objectionable taste are secreted within the animal. For example, in ketosis, lactone bodies are produced by the cow and secreted in the milk, resulting in a "cow-y" off-flavor.
2. From the feed, in which case feed volatiles pass through the cow into the bloodstream and are secreted into the milk.
3. From an absorption of odors into the milk, such as barny odors from a poorly ventilated stable or barn, which results in an unclean odor.
4. From the decomposition of milk constituents as a result of bacterial growth, as in slow cooling of milk and/or dirty equipment.
5. From foreign material that may gain access to milk, such as manure, straw and/or insects.
6. From changes due to chemical deterioration of milk constituents, as in rancidity and autooxidation of lipids.

Genetic heritage has played a major part in the development of the dairy cow. Applied genetics provide the dairy cow with the potential or ability to produce ever increasing amounts of milk. If a dairy cow has low genetic potential from its parents, obviously the cow will not be able to economically produce milk. On the other hand, if the parents have high genetic capabilities, then offspring should inherit the potential to produce a great deal of milk.

ON FARM FILTRATION OF MILK

The goal of every dairyman is to produce good quality, sediment-free milk. This job cannot be done with the use of a milk filter alone. Other factors involved are:

Cows

A. Udders and teats should be washed with an udder wash which contains a suitable sanitizer, and dried with a single service towel prior to milking.
B. Udder wash should be changed before it becomes unsanitary.
C. Cow udders, teats, flanks, and belly should be clipped.

Milking Equipment

A. Teat cups should not be allowed to touch the floor or any other object. A milker with vacuum on will draw foreign material into it.
B. Milking equipment should be in good operating order.
C. Milking equipment should be properly sanitized with an acceptable sanitizer.

Feeding

A. Since most dry feeds contain dust, feeding should be completed prior to milking.
B. Hay chutes should be closed during milking in a stanchion barn.
C. Ceilings should be tight so that chaff and dust are kept out of the milking area.

Milking Area

A. Stalls should be clean and well-bedded.
B. Cowyards should be clean and dry.

Bulk Tanks

A. Tanks should be cleaned properly.
B. Tank covers should remain closed to keep out dust, chaff, insects.

Water Supply

A. The water supply should be checked at regular intervals to be sure that it is free of bacteria and sediment.

Milk Filters

A. In Line Socks and Tubes
   1. Use a high quality in line filter which will collect extraneous material.
   2. Be sure that the filter support holder is free of sharp edges which could puncture the filter media.
   3. Carefully slide support holder into the sock or tube filter.
   4. Wet the filter with clean water prior to insertion into the milk line.
   5. Carefully and slowly insert holder and filter media into the line. It may be necessary to turn the unit as it is being inserted into the line.
   6. Inspect the filter upon completion of milking to determine sediment type and correct any evident problems.

B. Gravity Disk or Roll
   1. Use a high quality disk so that extraneous material will be stopped on the disk.
   2. Properly place disk into strainer.
   3. Keep strainer and carrying pails covered.
   4. Read filter disks after straining to determine how clean the milk is and to determine where problems may exist.
   5. Correct problems that are evident.

C. Bulk Tank Check

Bulk tanks should be checked for sediment on a regular schedule. As the milk is being pumped from the tank to the transport truck a periodic check with a Sani-Guide pipeline insert will determine the amount of large size sediment in the bulk tank.

If sediment is discovered on the pipeline insert, action should be taken to correct the problem. Some causes of sediment in the bulk tank are:

1. Tank covers left open, allowing dust, insects, and other foreign material to enter.
2. The use of no milk filter.
3. Rupture of filter media.
4. Lack of cleanliness and improper sanitation practices.
5. Use of flannel or other improper filter media.

The use of a milk filter should be viewed as a method to determine the extent of cleanliness of the cows, the milking area and other surroundings. Ideally, the milk should be free of extraneous material or sediment prior to going through the filter media. The objective of a milk filter is not to "clean milk," but to provide a quality check on milking management practices.

MILK AS A SOIL

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Residues left by milk are not removed by any single chemical action. Temperature and alkalinity of the cleaning solution are important in removing milk fat from equipment surfaces. Milk proteins and minerals can cause serious cleaning problems. Prevention of film formation is desired over film removal. The dairyman or food plant operator should recognize and attend to residual films immediately.

Many problems of dairy and food plant sanitation occur because operators do not appreciate the nature of the residual material they are trying to remove. Most foods, and milk in particular, are much more complex than might be thought.

Residues of these food materials, commonly known as "soils", are not removed by any single chemical action. Thus, detergents compounded to clean food-soiled equipment must be mixtures of ingredients, each with its own role in removing these soils.

A simple list of milk components looks something like this:

> Water 82-90%, average 87%; milkfat 2.5-8.0%, average 3.9%; casein 2.3-4.0%, average 2.5%; albumin 0.4-1.0%, average 0.7%; milk sugar 3.5-6.0%, average 5.0%; ash 0.5-0.9%, average 0.7%.

Obviously, the water in milk creates no problems in soil removal. Yet its absence, as in a dried film, can cause serious difficulties. Sucrose and other sugars are not major cleaning problems because they are soluble in hot water and wash away easily. However, they provide a quick source of energy for microorganisms when food residues are left on equipment surfaces.

Both temperature and alkalinity of the cleaning solution are important in removing milk fat from equipment surfaces. Milk fat begins to solidify at temperatures below 100° F. Thus, it is necessary to maintain solution temperatures above 100° F throughout the cleaning cycle. Otherwise, fats removed early in the cleaning process may be redeposited on already cleaned surfaces. In recirculating systems, fat and protein residues may be removed in the early part of the cleaning cycle. However, they may be redeposited on the surfaces of the more troublesome parts of equipment. Alkaline reagents must be incorporated into the detergent formulation in sufficient strength to maintain fatty residue in tiny droplets. Then, they can be easily removed during rinsing. This is called emulsification. Fat removal is so important in dairy sanitation because an oily or greasy binder holds other soil ingredients on the dirty surface.

Residues of milk proteins can be very difficult to remove. They form a highly adhesive film, like white glue and the detergent mixture must contain chemicals that "peptize" the proteins to render them more soluble. It has been shown that small concentrations of chlorine combined with alkaline materials greatly speed up this action. Thus a group of chlorinated detergents aid in removing protein films. These compounds must not be confused with chlorine sanitizers, since they do not contain enough chlorine for effective bacteria control. Proper concentrations of chlorinated detergents in wash solutions are imperative for successful removal of milk proteins. Loss of chlorine due to evaporation from an unprotected container, or use of "weak" detergent solutions often results in yellow to blue protein films. These are not removed by usual milkstone removers.

Milk minerals may cause serious cleaning problems, also. The late Dr. David Levowitz (Director, New Jersey

Dairy Laboratories, New Brunswick, NJ) pointed out years ago that the normal calcium and magnesium content of milk is roughly equivalent to 88 grains of water hardness. That the minerals do not precipitate out when milk is held for long periods is due to the fact they are held in suspension ("sequestered") by the phosphates in milk. However, when a milk film is water rinsed, soluble phosphates are removed and the remaining insoluble calcium and magnesium begin to deposit on container walls. Thus, it is important that the complete washup should immediately follow rinsing. Also, reactions of milk minerals with water minerals and certain cleaning chemicals may cause residues to develop. These form the foundation of the common milkstone film.

Prevention of milk film formation is desired over film removal. This is because such buildups cause further deposition of milk components and add to the "scale" of water and/or milk minerals. Corrosion or pitting under the films occurs when the film prevents oxygen from contacting the stainless steel. This produces a roughened surface that will always be a cleaning problem. Such films appear very porous when viewed under a microscope. They trap the milk fat and protein, creating perfect hiding places for huge microbial populations. Unfortunately, such films are not visible when viewed on a wet stainless steel background. They appear as a white film as soon as the surfaces dry.

The history of the film is very important. A container that is washed immediately after milk has been removed will be cleaned with little difficulty if the rinse water is body temperature and mineral-free. Since all the milk constituents are emulsified (fat), dispersed (proteins), or dissolved (lactose and salts) in water, proper rinsing will remove most of the milk film. A simple alkaline detergent in warm, soft water will take care of the residue.

When food residues have been allowed to stand on equipment surfaces, many changes take place. All of these are detrimental to film removal. Air drying, bacterial action, inadequate or improper rinsing all cause a change in the physical and chemical nature of the film and cause cleaning problems. Thus it is important that cleaning be done immediately. Too many milk producers leave general cleanup until after breakfast and leave tank cleanup until just before milking. If the bulk collector comes at mid-morning to empty and rinse the tank, the several hour delay in cleanup can cause serious sanitation problems.

Likewise, too many dairymen clean equipment once a day with just a quick rinse after the night milking. No rinse job removes all surface traces of milk. The remaining milk components dry to form a film removed only with considerable expense and effort. And this is a common cause of high bacteria counts. Microorganisms readily multiply overnight with such a valuable food supply.

In some cases, limited time causes a producer to miss a turn or two in the normal sanitation program. This may be caused by harvest season or a hauler arriving during milking. Emergencies will never stop occurring. However, remember that the quick rinse and no cleanup leaves a film under new milk. The usual sanitation system wasn't planned to remove multifilm residues.

Then when operators do get to perform the complete cleanup to reestablish the sanitation program, they must remember that it will take more detergent than usual to do the job. They must be very sure there is enough hot water to completely remove accumulated residual films as well as to take care of the current cleaning load. Sometimes it's necessary to repeat the entire cleaning cycle, even though no new residues are present. Otherwise, a very stable film will be established, resulting in buildups and high bacteria counts.

The removal of milk films is neither mysterious nor difficult. Remember that milk is a complex food material and must be treated as such for proper cleanup.

Dairy or food plant operators should recognize the properties of residual dairy and food films. They should attend to cleanup immediately after use whenever possible and use detergents carefully selected to do the job at hand. Attention should be given that these cleaning solutions are used in proper concentration and at recommended temperatures. There is no sense in making trouble by ignoring simple facts of cleaning chemistry.

Committee Reports

FARM METHODS COMMITTEE

ANTIBIOTICS, PESTICIDES AND OTHER ADULTERANTS SUBCOMMITTEE

The Subcommittee, through its various task groups, is continuing its responsibility concerning the adulteration of milk supplies. Since the last report the Subcommittee has been involved in the following areas:

I. The potential problem of detergents and sanitizers in the milk supply.
Cleaning and sanitizing compounds are essential in effective programs for the production of a safe, quality milk supply. But potential problems need to be recognized and prevented. Therefore, there needs to be continued emphasis through educational programs directed towards the producer for the proper handling, storage, and use of these compounds. The Subcommittee will follow-up on the possibility of developing such an educational program.

II. The potential problem with surfactants in water supplies. Inquiries have been made of federal, state, and local regulatory officials and industry personnel involved with both potable and farm water supplies as to an alleged problem with surfactants in the water supplies. No evidence of a problem has been found. If a problem does exist, it must be local in nature rather than of national significance. As a sideline to the investigation, a number of individuals commented that improperly functioning farm type chlorinators and psychrophiles in dairy farm water supplies are the two major problems encountered with rural water supplies. The Subcommittee recommends that there is no need to take any action on the problem of surfactants in water supplies at this time.

III. Current activity by State regulatory agencies concerning adulterants in the milk supply. A survey was conducted of the State regulatory agencies concerning adulterants in milk and milk products. A total of 47 States responded. From those States responding, 16 have only Grade A milk while 31 have Grade A and manufacturing grade milk. Survey results:

I. *Aflatoxin*

1. Is aflatoxin a problem in your State?

Yes	13
No	31
Not known	3

2. Are aflatoxin tests run on Grade A raw milk by a State Agency?

Yes	18
No	29
Frequency	
Yearly	2
Twice	1
Monthly	3
Random	8
Upon Request	1
Where feed is found positive	1
When test results show .3 ppb	1
Not stated	1

3. Are aflatoxin tests run on manufacturing grade raw milk by a State Agency?

Yes	10
No	20
Not stated	1
Frequency	
Yearly	1
Random	6
Where feed is positive	1
Upon request	1

4. Are aflatoxin tests run on finished products by a State Agency?

Yes	19
No	27
Not stated	1
Frequency	
Yearly	3
Quarterly	1
Monthly	3
Continuous	1
Random	7
Not stated	5
Type of product (s)	
(a) *Dairy*	
Grade A milk	11
Dairy products	3
Cheese	2
Cottage cheese	1
Ice cream	1
Butter	1

NDM	1

(b) *Feed*

Feed	3
Silage	2
Corn	2
Soybeans	1

5. What test procedures (methods) are being used?

Thin layer chromatography	14
AOAC - 12th Edition	5
High pressure liquid chromatography	4
Mini-column	3
FDA	1
Not stated	4

6. List those products in which aflatoxin has been found.

(a) *Dairy*

Milk	8
Raw milk	6
Cottage cheese	1
Cheese	1
Buttermilk	1
Yogurt	1
Ice cream	1

(b) *Feed*

Corn or corn meal	6
Cottonseed or cottonseed meal	4
Finished feeds	3
Silage	2
Cereal grains	1
Rice bran	1

11. *Antibiotics*

1. Are antibiotic tests run on Grade A raw milk by a State Agency?

Yes	49
No	5
Not stated	2
Frequency	
8× per yr.	5
4× in 6 mo.	8
every 6 wks.	1
quarterly	2
monthly	9
weekly	2
daily	1
random	1
all samples taken	3
routine	1
not stated	7

2. Are antibiotics test run on manufacturing grade raw milk by a State Agency?

Yes	20
No	10
Not stated	1
Frequency	
yearly	1
2× per yr.	1
4× in 6 mo.	2
every 6 wks.	1
quarterly	1
monthly	3
daily	1
random	5
all samples taken	1
not stated	4

3. Are antibiotic tests run on finished products by a State Agency?

Yes	40
No	5
Not stated	2
Frequency	
8× per yr.	7
4× in 6 mo.	7
every 6 wks.	1
quarterly	1
monthly	7
weekly	2
daily	1
winter mos.	1
all samples taken	5
random	2
upon request	1
not stated	5
Type of product (s)	
All milk products	10
Grade A milk	12
NDM	7
Frozen desserts	2
Butter	1
Not stated	5

4. What test procedures (methods) are being used?

Bacillus subtilus disc assay	39
Sarcina lutea cylinder plate method	10
BB1 cylinder plate method	1
Delvo P	1
AOAC	1
Not stated	1

5. List those products in which antibiotics have been found.

Raw milk	21
Homo milk	18
All milk products	7
NDM	7
Skim milk	6
2% and lowfat milk	4
Chocolate milk	4
Cream	3
Ice milk mix	1
Cottage cheese	1

111. PCB

1. To what degree is PCB a problem in the milk supply of your State?

None	27
Insignificant	12

Significant	1
No information	4
Not stated	3

2. What test procedures (methods) are being used?

Gas chromatograph, gas Liquid chromatograph, Electron capture Detector	15
FDA's Pesticide Analytical Manual	10
AOAC - 12th Edition	2
Not stated	14
Not testing	6

3. What is the frequency that you test for this compound?

Yearly	7
Every 6 mo.	4
Quarterly	1
Every 30 or 90 days, producers	1
Every 6 mo., routes	1
Monthly	1
Weekly screening	1
720 samples/yr.	1
200 samples/yr.	1
Random	5
On request only	5
FDA requirements	1
Not stated	18

IV. PBB

1. To what degree is PBB a problem in the milk supply of your state?

None	34
Insignificant	3
Significant	0
No information	8
Not stated	2

2. What test procedures (methods) are being used?

Gas chromatograph, gas liquid chromatograph	13
FDA Laboratory Information Bulletin	4
AOAC	1
Not stated	16
Not testing	13

3. What is the frequency that you test for this compound?

Yearly	2
Every 6 mo.	3
Quarterly	1
720 samples/yr.	1
200 samples/yr.	1
Random	5
On request only	4
FDA requirements	1
Not stated	15
Not testing	14

V. Pentachlorophenol, Wood Preservatives.

1. To what degree are these compounds a problem in the milk supply of your state?

None	30
Insignificant	6
Significant	0
No information	6
Not stated	5

2. What test procedures (methods) are being used?

Gas chromatograph gas Liquid chromatograph	10
FDA Pesticide Analytical Manual (221.136)	2
FDA Laboratory Information Bulletin	1
Modified Procedure By ACPB, FDA	1
EPA, PAM, Section 5A (4) (a)	1
AOAC	1
Metholation	1
JAOAC, Vol. 61, No. 4. 1971	1
Not stated	11
Not testing	17

3. What is the frequency that you test for this compound?

Yearly	2
Bi-monthly	1
Random	5
On request only	7
When a known problem exists	1
Not stated	15
Not testing	16

VI. What are the State compliance procedures when an adulterant is found in the milk or finished product?

Suspend sale of product Until in compliance 1/	33
Product recall	9
Destroy product if detrimental to health	9
Condemnation following a Hearing	1
Not stated	4

1/ (a) One reason: second violation in 2 yrs. - milk or product withheld from market for 2 days. Additional violation in 2 yrs. - Milk or product withheld from market for 4 days.

(b) One response: positive antibiotic - Milk not picked up until negative, and a 4 day suspension imposed.

VII. What other adulterants does your agency feel a need for a surveillance program?

Added Water	7	Encrin	1
Pesticides used in Insect and rodent control	5	Sulfa	1
		Toxophane	1
		Lindane	1
Sediment in fluid milk	3	Detergents	1
		Pharmaceutical drugs other than inhibitory substances	1
Organophosphates	2		
Dieldrin	2		
Heptachlor epoxide	2		
All chlorinated pesticides	2	Arsenic	1
		Trace metals	1
All phosphate pesticides	2	Radiation	1
		Stabilizers and	
Carbonates	1	Added color in frozen desserts	1
DDT	1		
DDE	1	Vitamin analysis	1
TDE	1	None	4
Endrin	1	Not known	1
Pentachlorophenol	1	No reply	4
Malathion	1		
Holocarbon	1		
Endosulfon	1		
Methozychor	1		
Aldrin	1		

The task group working specifically in the area of antibiotics has not completed its work on rapid test methods as related to the user. This work should be completed during the coming year for inclusion in the next report.

SUBCOMMITTEE MEMBERS

Matthew Andrews	Robert Marshall
Jay Boosinger	Michael Roman
A. Richard Brazis	Kermin Smith
Gerald Heine	Kenneth Whaley
Richard White	Richard Webber (Chairman)

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COMMITTEE ON SANITARY PROCEDURES

One meeting of 3-A was held since the last report:
3-A Meeting: During Dairy Expo, Chicago, IL November 14, 1979.

This is to advise of the action taken by PHS/FDA-CSP on the tentative 3-A Sanitary Standards at the meeting in Chicago on November 14, 1979.

1. T-26-80
   This tentative amendment was accepted without change.
2. T-13-07
   This tentative amendment was accepted with the following suggested editorial change: Line 3 should read "The gauge shall comply. . ."
3. T-32-01
   We do not see any reason to change the radius requirements to a lesser amount. We feel that the present requirements of a 3/4 inch radius should be retained.
4. T-24-01
   Returned to SSS-DIC with comments.
5. T-25-80
   Returned to SSS-DIC with comments.

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Clinton Van Devender, Mississippi State Board of Health, C/O Milk Control Division, Jackson, MS 39205.
Richard Webber - CSP, FSQS, Poultry & Quality Div., Standardization Branch, U. S. Dept. of Agriculture, Washington, D. C. 20250.
Earl O. Wright, Ex Officio, Journal of Food Protection, P. O. Box 701, Ames, IA 50010.

Affiliate News

Quality Assurance, Industry Preview on NY Program

Carcinogenicity in food additives, a preview of the dairy industry in the Northeast for the years 1980-85, and current developments in starter culture technology--- these were among the issues discussed at the 57th Annual Conference of the New York State Association of Milk and Food Sanitarians, held last fall in Syracuse.

Other program sessions included "Methane and Alcohol Production for the Dairy Industry," Larry P. Walker of Cornell University; "Energy Saving Techniques for the Dairy Farm," Richard K. Koelsch of Cornell University; "New York State Dept. of Agriculture and Market's Sampling Program," Alfred R. Place and Maurice A. Guerrette of the New York State Department of Agriculture and Markets; "Quality Assurance for Food Plants and Warehouses," William Pursley, American Institute of Baking; "Quality Assurance in Food Service Operations, Ulfert H. Esen, United Airlines; "Quality Assurance of Private Label Foods," Myron Schmutzer and Arnold Flakowitz, Wakefern Food Corporation.

A number of other sessions were also held, including a special session on standards, with "The Role of USDA Food Equipment Standards," Bartie T. Woods of the USDA, and "The Role of ASME & BISSC," Frank D. Hayman, Nabisco, Inc.

"Inside the 1980 Olympics," was the final program session, discussed by John Eadie of the New York State Health Department.

John R. Bartell, Associate Professor of Dairy and Food Science and Curriculum Coordinator for Agricultural Science at SUNY Agricultural and Technical College, Alfred, was elected to the Executive Board of NYSAMFS. He was also the recipient of the Brooks Memorial Award, given to an Association member who has contributed to the welfare and progress of the NYSAMFS affiliates. Bartell has served as secretary-treasurer to two different affiliates during his time in the Association and is still the secretary-treasurer of the South Central Affiliate. He has been a member of NYSAMFS for 18 years.

Donald L. Downing was the recipient of the William V. Hickey Award, presented to a NYSAMFS member who has made outstanding contributions in the field of food sanitation. Downing is a professor of Food Processing Extension, Department of Food Science and Technology, New York State Agricultural Experiment Station, Cornell University.

The Gauhn Memorial Award, presented in memory of the Association's first president, was presented to Charles J. Gimbrone for outstanding service and leadership in behalf of the Association. Gimbrone is Chief Sanitarian and Training Officer in the Health Department's Office of Local Health Management.

Charlotte Hinz turns the presidential gavel over to Howard Cobb, President of NYSAMFS for 1981.

Ralph S. Taylor received the ninth annual Reich Memorial Award for outstanding service in the field of milk sanitation and quality control. Taylor is a field sanitarian with the Niagara Milk Producers Cooperative, Inc., Niagara Falls.

The Marlatt Award was presented to Thomas G. Noonan for outstanding service in the field of laboratory technology. Noonan is in the Research and Development division of M&M-Mars Candy, Inc.

Honorary Life Memberships in NYSAMFS were presented to Richard P. March, Barbara P. March, George Reigelsberger, Edward Jensen, Allan Essler and Paul Corash.

WMSA Plans Annual Meeting

When the Washington Milk Sanitarians Association met for their Annual Meeting this fall, much of their time was spent preparing for the 1981 IAMFES Annual Meeting, which they will host Aug. 9-12 in Spokane.

Dr. Bill Roth, President of the Washington Association, presided at the luncheon. Earl Wright, Executive Secretary of IAMFES, reported at that luncheon on IAMFES activities.

The afternoon program consisted of Committee meetings, reports and activities.

Featured speaker at the Annual Banquet was Dr. Larry Branen, Chairman of the Department of Food Science and Technology. He discussed his visit to Libya and the many problems of that part of the world.

Officers elected to serve for 1981 included: George Andrews, President; Immediate Past President, Bill Roth; President-Elect, Jim Larson; Secretary-Treasurer, Lloyd Leudecke.

Ohio Association Holds First Meeting

A crowd of between 80 and 100 persons greeted planners of the first Annual Meeting of the Ohio Association of Milk, Food & Environmental Sanitarians, held this fall in Columbus. The Ohio Association received its charter at the 1980 IAMFES Annual Meeting.

Among program sessions at the meeting, Edward Leavitt, Supervisor of Milk Products Control for the Montgomery County Health Department spoke on "Milk Sanitation," while Dr. E. M. Mikolajcik, Associate Professor of Food Science & Nutrition at Ohio State University, addressed the issue of "Tests for Evaluating the Raw Milk Supply."

Business meeting discussions highlighted aspects of the by-laws and constitution and their adoption. This discussion was led by Harry Haverland, Vice President of IAMFES and a member of the Ohio Association. Earl Wright, Executive Secretary of IAMFES, brought greetings from the International and highlighted the year's events.

Officers elected to serve for 1981 include: Robert Farst, President; Bryan Black, Vice President; John Lindamood, Second Vice President; Ronald H. Smith, Secretary-Treasurer; and Harry Haverland, IAMFES Advisor.

Officers for the new Ohio Affiliate include, top, l to r, John Lindamood, Harry Haverland, Ronald Smith and Bob Farst. Bottom photo shows some of the persons who attended the first Ohio meeting.

Californians Discuss Antibiotics in Milk

Antibiotics in milk, were viewed from many perspectives at the Dairy Industry Conference, sponsored last fall by the California Association of Dairy and Milk Sanitarians.

The conference, held in Sacramento, included the following sessions, among others: "What We are Doing to Improve Handling of Dairy Foods in Schools," "Wind, Manure and the Sun. . .Energy Sources at the Farm," "Energy Usage on Farms," "Milking System Design and Performance. . .UC's Approach," "The *Bacillus stearothermophilus* Test for Antibiotics. . .What it Can and Cannot Do," and "Single Service Containers. . .Aspects of Quality Control."

The antibiotics issue was addressed by representatives of a university, milk producers, a drug company, processors and regulatory agencies.

"There's no point in saying we shouldn't be in this muddle. The fact is, we are, and now we have to get out," said Jay Goold, Manager, League of California Milk Producers. He looked at the antibiotics problem and the "Responsibility of the Producer."

"The responsibility of the dairyman is to maintain the farm so that there isn't so much of a need to use antibiotics. Cutting down mastitis means there is less of a need for antibiotics," Goold emphasized. When choosing personnel for the farm, "Look for the type who will do a good job so that if you're away from the dairy for three days, you have people you can rely on." He added, "The dairyman has the responsibility *not* to hide behind the regulatory confusion."

James Ver Steeg, a veterinarian with the UpJohn Company, represented the drug company's point of view in the antibiotics issue. "We have to communicate, to understand each other's needs," he said. "Products have to be based on sound research and have to be promoted in a responsible manner. Antibiotics, per se, are not the answer to mastitis. Management is the answer to mastitis," he emphasized. A problem of drug residues when label directions are followed are generally due to insufficient product testing, unusual residue stiuations, or a changed sensitivity level, Ver Steeg said. "If we lose the active support of the dairyman in the residue problem, then we've lost the ballgame," he emphasized.

Addressing the point of view of the regulatory agencies, Lee Lockhart, Chief of the California Bureau of Milk and Dairy Foods Control, warned that a dairy can be suspended from production if antibiotics are consistently found in the milk. "The answer to the problem is herd management. Good herd managers rarely show up with this problem," he emphasized.

Alberta Looks at Poultry Industry Salmonella Control

Ken Pennifold, center, receives the "Sanitarian of the Year" Award from Don Paradis, left, and Dennis Thomson, right, officers of the Alberta Association.

The Alberta Association of Milk Food and Environment Sanitarians completed its 1980 program activities in October, at which time its annual meeting was held. One of the highlights of the meeting was the presentation of the AAMFES "Sanitarian of the Year Award". This year's recipient was Dr. Ken Pennifold, recently retired after 30 years with the City of Edmonton Board of Health.

The year's activities commenced in February with a program discussing the "Control of Salmonella in the Poultry Production and Processing Industry". Speakers were Al Bently and Dr. Jim Pettit, coordinators of a newly formed Salmonella Co-ordinating Unit which works to develop recommendations which will meet the Federal Government's goal of reducing the incidence of salmonella in the food system.

In June the affiliate met in Central Alberta at Red Deer, where they toured Philet Meats Ltd., a meat processor specializing in flake-formed products, and a Hutterite Colony exemplifying a large, diversified farming operation. Also included in the meeting was a technical program discussing "Education vs. Regulation in Public Health" by Dr. Harry Jackson; "Marketing Considerations in the Promotion of Farmers Markets" by Dan Ness; and "Public Health Considerations in Farmers Markets," by John O'Laney.

The October meeting featured a tour of the food preparation and distribution systems at a government operated hospital for the mentally ill. The hospital has recently installed a cryogenic freeze-reheat system for entrees. A panel discussion, "Public Health Inspection: Origins, Activities and Directions," was conducted by public health inspectors; Dennis Thompson, Leu Goddard, and Ken McAmmond.

Stray Voltage Among Minnesota Program Sessions

Stray voltage on dairy farms, preparation for nuclear accidents, and an update of sanitarian registration---these were among the many subjects Minnesota Sanitarians discussed at their conference in the fall.

Chemical contaminants, quality assurance and product recalls, and "Mastitis---A to Z" were also on the program.

Two extension men, Robert Appleman and Harold Cloud, demonstrated a "Model Electrical Distribution System Showing Cause and Control of Stray Voltage on Dairy Farms."

"We don't claim that it (stray voltage) causes mastitis, but if we're working with a cow likely to have mastitis, this can result in clinical cases occurring much more readily," they noted. Stray voltage is a national problem, not the problem of a particular state or region, they noted.

Among the symptoms of stray voltage problems are uneven milk out, cows nervous while in the parlor, cows reluctant to enter the parlor, increased mastitis, reduced feed intake in the parlor, reluctance to drink water, and lowered milk production. Appleman and Cloud said that in checking symptoms, it's important to determine whether they are caused by stray voltage, or if they are due to some other cause. The stress of stray voltage increases somatic cell counts. In one case, a farmer's vet bill went from $15/cow/year to $40/cow/year. In another case of stray voltage, a 2000 lb./cow/year loss in milk production resulted. A loss of $40,000-$50,000 in two years occurred before the problem was identified to be stray voltage, and before an $800 correction was made.

The speakers noted that sanitarians and fieldmen who work constantly with dairymen can guide them as to what direction to go when there are problems such as stray voltage. "Progress in mechanization of farms has been hampered some by a lack of cooperation," they said. "Dairymen haven't recognized the complexity of the electrical system, and power company engineers haven't recognized the sensitivity of the cattle," they said.

A very different problem from stray voltage was discussed in the session, "A Nuclear Accident in Minnesota---What Sanitarians Should Know." Where nuclear accidents may occur in the future, "the sanitarians' role comes in after the accident is over, where the possibility of contamination occurs," said Tom Hench. He is with the Minnesota Department of Public Safety.

A ten-mile radius around each nuclear power plant in

con't. on p. 79

DRINC Research, Soft-Serve Sanitation on Illinois Program

Antibiotic testing in milk was discussed in one of the program sessions at the Fall Conference of the Associated Illinois Milk, Food and Environmental Sanitarians, held this fall in Elgin, IL. William Menz, of DRINC, the research arm of the American Dairy Association, spoke on "Research Programs of ADA, with Special Emphasis on Antibiotic Testing."

"We hope that a year from now an on-farm test for antibiotics will be readily available," Menz noted. "The real dilemma of the industry gets right to the point of where do we set the limits of acceptability of antibiotics?" "We're able to detect lesser and lesser amounts of antibiotics. One Japanese test is able to detect antibiotics in parts per quadrillion (10^{-16})," Menz noted.

Research projects which DRINC is helping to fund, among others, include aflatoxins in milk and dairy products, at the University of Wisconsin; milk flavor and off-flavors which are objectionable to the consumer, at Cornell University; and direct and indirect heating equipment for UHT milk, at North Carolina State University.

Dan Johnston of the Taylor Freezer Company looked at "Sanitation Aspects of Shake and Soft-Serve Freezers."

"There is an increasing awareness by retail operators of the consequences of poor sanitation," Johnston said. "Local ordinances dictate to a large degree the cleaning procedures used with the freezers, despite what the instruction book recommends," he noted. "Sanitation problems can begin before the mix even enters the machine," he noted. Mix problems, overcrowding of the storage cooler, and poor rotation of inventory can cause some of these problems, Johnston said.

Top, Pat Bloomquist, Illinois Dept. of Health, accepts a door prize from Howard Ferriera, Illinois Association President. Below, President-elect, Ray Moldenhauer, Illinois Dept. of Health, left, visits with Vernon Porter, University of Illinois Dept. of Food Science.

"Efficient Cleaning of Raw Milk Equipment with Cold Water," was the subject which R. L. Bradley of the University of Wisconsin addressed. One of the problems which may be encountered with the colder water cleaning, Bradley said, is that some cleaners may be used at temperatures around 105°F, while in Wisconsin, for example, law requires that 120°F be used for cleaning.

The objective of the cleaners is to reduce water temperatures as low as possible without cutting cleaning and sanitation, and to reduce on-farm energy demands, Bradley noted. "Every dairy farmer now has the possibility of markedly reducing his total energy cost," he said.

Other program sessions at the Conference were "Corporate Commitment to Quality Assurance," Doug Delaney, Red Lobster Inns; "Guidelines for Sanitation and Pest Control," Lloyd Welch, Lystads, Inc.; and "The Microwave Oven---Theory and Application," Vernon Porter, University of Illinois.

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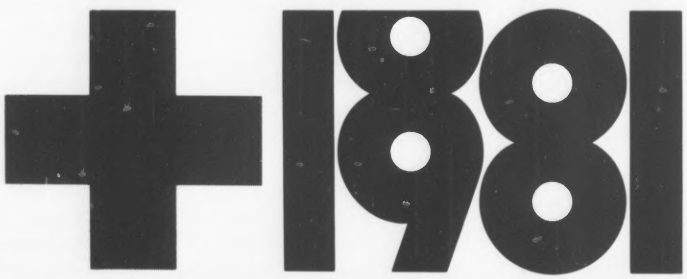

NIFI Reports on Foodservice Sanitation Training

The National Institute for the Foodservice Industry (NIFI) has developed, under contract with the FDA, a report on a uniform national plan for sanitation training of foodservice managers and a reciprocity plan for such training and certification program.

Following its approval of the NIFI reports, the FDA issued the *Foodservice Manager Training and Certification Program* (HHS Publication No. FDA 76-1009), a brochure which has been revised to incorporate a section on reciprocity.

Single copies are available free from:

NIFI
20 N. Wacker Drive - Suite 2620
Chicago, Illinois 60606
312/782-1703

Illinois Officers Testify Before Sunset Committee

Two Illinois Affiliate officers, President Howard Ferreira and Secretary-Treasurer Robert A. Crombie, appeared before the Illinois Select Joint Committee on Regulatory Agency Reform in Chicago on October 22, 1980. Their testimony was in accordance with the resolution passed at the Annual Meeting in support of continuation of the Illinois Sanitarians Registration Act.

This Illinois legislative committee, sometimes known as the "Sunset Committee," is reviewing the need for continuation of certain registered or licensed professions. The Illinois "Sanitarians Registration Act" is scheduled for repeal October 1, 1981 unless findings justify its continuance in the interest of the public welfare.

Minnesota Meeting, con't. from p. 76

Minnesota has been marked, and would be the primary area of concern, should an accident occur, Hench said. Sample collection on dairy farms, and collection of field, soil, water, and vegetation samples would be the sanitarians' role following a nuclear accident. Responsibility for the sanitary aspects of evacuation shelters would also fall into their jurisdiction, Hench said.

Quality assurance and product recalls are greatly affected by the complexity of the decision-making environment today, noted the Director of Product Safety for General Mills, Bob Pickenpack. "There's information on all sides, pro and con," of any issue, he said. "Science and social conscience all influence decision-making now," he added. "We must deal with more complex situations with more limited resources. "It is not impossible to do this, but we must concentrate more closely on the vital elements involved, we must get the right people working together on the vital few elements." "Food Manufacturing Practices and other regulations are only as good as the particular individuals who are carrying them out," he explained.

"What is the capability of the quality assurance system? You do not inspect quality into something. It's built in," Pickenpack said. A preventative effort is the best way to assure product quality. "We want to stop problems at the supplier level, before raw materials get to us." "Often quality assurance is not a question of 'can we afford to do this?" but 'can we afford not to do this?" Pickenpack noted. An important aspect of a quality control program is the employee's perception of management's concern and anxiousness to do the job right, Pickenpack added.

Highlighting the regulatory point-of-view on product recalls, Henry Roberts, Deputy Regional Food and Drug Director, FDA, addressed "Case History of a Food Recall."

The FDA does not get involved in recalls unless there is interstate movement of products, Roberts said. Products are classified according to their risk. Class I for example, poses imminent danger to public health, whereas Class III poses a possibility that there is a danger to the public health, Roberts said.

"We cannot force a recall, except in the case of medical devices or some drugs. "Most recalls are voluntary, while others are FDA-initiated," Roberts said. "If they don't recall a product, we may go out and make some well-placed seizures. We've got to get their attention somehow. . ." he said.

Most product recalls are Class II, which means the product has a probability of presenting a danger to the public health. Many problems occur in distribution, Roberts said. In the food industry, where there is so much mass-production and wide distribution, it can be very difficult to trace shipments, Roberts said. "Big firms are computerized, which helps, but smaller ones present some problems." "Many firms can account for 98% of a product shipment and a particular product code within a short time. They may not actually have the product in hand, yet, but they can account for it."

Most recalls are not in the food business, Roberts noted. "When we do get into the food business, the problems are due to the massive numbers of units produced and sold," he said.

Dr. Edmund Zottola received the Certificate of Achievement Award from The Minnesota Sanitarians at their Award Banquet. Zottola was honored for exceptional service to the Association. Leonard Waldock was honored with Honorary Life Membeship.

Case Studies in Sanitation

This and future Case Studies in Sanitation *are written by Frank Raffaele, Vice President of Regulatory Compliance, American Institute of Baking, 1213 Bakers Way, Manhattan, KS 66502.*

Case #1-Rodents

Early on the morning of February 3, 1967, FDA Field Inspector Ron Smith of the FDA's Cincinnati office pulled his car into the lot of Myron's Bakery located in a suburb of Cincinnati.

Unlike other routine visits, Ron was there for a specific purpose. Some 48 hours ago, a telephone call was received from the FDA regional director concerning a consumer complaint which alleged the presence of rodent feces baked into a Myron's frozen cream pie.

Prior to alerting Smith of this situation, the FDA collected the specimen and the regional laboratory confirmed the presence of the adulteration which under wide field microsopy were confirmed to be three mouse excreta pellets. Ron Smith's instinct told him this was just the start of a long day at Myron's.

Myron's of Cincinnati was a well established bakery having been founded and run by the J. B. Myron family some 50 years ago. Up until 1963 the bakery was located in the city proper but that year its founder John Myron, then 68, died suddenly of a heart attack and the family quickly sold the enterprise to the Hexex Corporation who promptly changed management. During the same year the existing plant outside the city limits was built to avoid the mounting tax onslaught. And many of Myron's veteran management and production personnel were terminated because of "unreasonably" high wages.

John Myron was always very proud of his bakery which came a long way over the years from a simple retail bake shop to a semi-automated bread, roll, pie, and sweet goods operation. As business in the area increased and new areas of sales and distribution were added, the number of personnel on the bakery payroll in 1967 was 150.

Following the completion of the new plant, Hexex installed a completely automated pie line and the product was offered not only fresh but production overruns were frozen for distribution in other states.

As Ron entered the plant lobby, he was immediately acknowledged by Sam Wright the security guard. After showing the guard his credentials, Ron looked at his watch, it was 8am.

At exactly 8:42am, Clover, the plant manager, appeared giving apologies for the delay and extended an invitation to follow him to his office.

In Clover's office, Smith decided to play it cool and never mentioned the rodent complaint but then it could be said that Clover, in dominating the conversation with trivia, never bothered to ask why he was there.

Ron Smith, although new with the FDA, had done his homework. The inspection started at the outside of the plant and generally followed the product flow. Ron's findings as outlined on FDA form 483 are now history and are covered in detail below.

Form 483

1. A large accumulation of old equipment and debris were noted along the outside of the building on both north and east walls.
2. Although the plant is serviced by an outside PCO only two outside rodent bait stations could be located and neither contained any form of rodenticide.
3. All four shipping doors and all four overhead receiving doors were damaged and did not close tightly. Gaps of ½" to 1½" were common to all.
4. At least three rodent burrows were noted in heavy grass along the south of the building and rodent runways leading toward the plant were visible.
5. Usable wooden pallets were stored alongside the compactor outside the south end of the building, several mouse and rodent pellets were removed from these pallets (spec #1).
6. Receiving records for raw materials shipped interstate were not maintained or available and examination of raw materials was not being undertaken.
7. Seven mouse excretion pellets were removed from inside a pallet of salt dated 1/67 (spec #2).
8. Exactly 20 mouse excreta pellets were removed from the center of a pallet of obsolete packaging material stored in the west end of the warehouse (spec #3).
9. Seven decomposed rodent carcasses were removed from the single Ketch-All® trap at the north side of the warehouse (spec #4).
10. A mouse nest containing seven baby mice were removed from the inside lower structure of an obsolete Hartman slicer stored at the south end of the warehouse (spec #5).
11. Eight mouse pellets were removed from a pallet of sugar in the mixing and scaling area (spec #6).
12. Forty-eight rodent pellets were removed from several pallets of corrugated cardboard boxes used to transport finished products (spec #7).

con't. on p. 81

Project Aims to Control Stored Product Pests

Using "fire to fight fire" is the principle behind a research project aimed at controlling insects that infest stored products---grains, cereals, fruits, vegetables, and nuts. The study is testing the use of very small parasites to control such insects. Roughly 10 to 30 percent of the food produced in the US each year is damaged by pests after harvest.

Dr. Earlene Armstrong of Maryland Agricultural Experiment Station is conducting the study.

Not only do pests damage or consume marketable products, but they also transmit disease-causing agents through the products they infest, contaminating far more food then they eat.

In recent decades, several methods of control have been used to suppress these stored product pests. Among the methods tried are chemicals, including fumigants, dust sprays and pesticides; applications of heat or cold to products to prevent or slow the growth of pests; and better sanitation. Another method now being looked at involves the use of biological agents, such as the parasites.

In her research, Dr. Armstrong has examined the survival of insects in stored products under varying conditions of light, temperature, and humidity, and is comparing their growth and developmental rates under those conditions. She is also trying to determine the susceptibility of the stored product pests to parasitic infection, as well as the effects of small parasites on susceptible pests.

Thus far, her research has focused on the red flour beetle, although additional emphasis in later studies will be placed on the saw-toothed grain beetle, Indian meal moth, cigarette, drugstore beetles and other insects.

While working with the red flour beetle, Dr. Armstrong altered environmental conditions and nutritional requirements to spur an increase in the parasite population, the aim being to kill the pest or at least reduce its population below economically destructive levels.

She found that parasitized insects lay fewer eggs, have reduced life spans and show incomplete development to the extent that many do not complete their life cycles. Each of these factors, over a period of time, would naturally reduce the pest population.

Dr. Armstrong is now examining the changes induced in the insects by the parasite's presence, an area of research that has received little study so far.

If successful, the experiments could lead to a reduction of stored product pests and the damage they cause, meaning that less food would be lost.

Case History, con't. from p. 80

13. Exactly 160 rodent pellets were collected from floor/wall perimeters around the building (spec #8). Many sprung traps were noted away from walls or unset or destroyed in some manner in many areas.

On February 4, 1967 Myron's was in the midst of a financially devastating recall from which they would never completely recover. Changes they were ordered to make included the following:

1. Obsolete machinery and all debris must be removed from around the outside of the building to eliminate potential rodent harborages. Either discard material that is not needed and/or provide an empty trailer body for storage.
2. The rodent control program is grossly inadequate. Either contract a professional outside PCO or have someone in the sanitation department certified under category #7. A crash program involving extensive outside and inside areas must be immediately undertaken.
3. All outside doors must be made tight fitting and rodent proof.
4. Eliminate high grass from around the south side of the building either manually or with the use of herbicides. A three inch by three foot crushed stone perimeter should be installed wherever possible.
5. Usable pallets should never be stored outside. By eliminating the obsolete machinery and packaging material within the warehouse, the pallets can easily be stored inside.
6. Receiving personnel must be trained to inspect incoming raw materials and should be provided with proper forms for record keeping purposes.
7. All rodent evidences must be eliminated from pallets and packaging material and from all floor-wall junctions. An intensive effort must be put forth to create an internal inspection team capable of identifying contaminated areas and monitoring adequate follow-up of control programs.
8. Contaminated raw materials must be reconditioned in accordance with FDA wishes. Specific reconditioning steps will be contingent upon the product type and the extent of the adulteration.

News and Events

Fairburn is SSI President

David Fairburn, Executive Vice President of Keyes Fibre, has been elected president of the Single Service Institute, the national trade association of manufacturers of single-use paper and plastic food service and packaging products.

Fairburn, who had been first vice president, was named to a one-year term to head the Institute at its recent annual meeting in Washington, D.C.

Fairburn succeeds James Schwartz of Phoenix, AZ as president of the Single Service Institute.

Other officers named at the trade association's annual meeting were first vice president, George Bark, President of American Convenience Products, Inc., Milwaukee, WI; and second vice president, Patrick Van Keuren, Vice President of Legislative Affairs/Corporate Public Affairs, American Can Company, Greenwich, CT.

James Martin, received the 1980 ACDPI Research Award, sponsored by Nordica International. Shown at the Award Presentation are, l to r, Mrs. Martin; Martin; Al Shock, President of Nordica; and ACDPI Immediate Past President, Robert Williams, the Kroger Co.

ACDPI Award to Martin

Dr. James H. Martin, Clemson University Dairy Science Department Chairman and Editor of the *Cultured Dairy Products Journal*, received the 1980 ACDPI Research Award, sponsored by Nordica International.

The $1,000 award and plaque, presented at the Institute's Annual Meeting and Conference in St. Louis, is given each year to a college professor to recognize excellence in cultured dairy product research.

The conclave, which featured an International Symposium dealing with marketing of cultured foods in Europe, drew 250 delegates from 40 states, Canada, Germany, New Zealand, and England.

NRA Receives Energy Award

At a special White House ceremony January 12, the National Restaurant Association (NRA) received the President's Award for Energy Efficiency. The NRA and other recipients of the award, including business groups, community organizations and private citizens, were honored for their work in energy conservation at a meeting with President Carter and Secretary of Energy Charles Duncan. Warren Rosenthal, Chairman of the NRA Energy Committee noted that "Educating the public of the need to conserve has been an important part of the NRA's energy program."

In April of 1980, President Carter established the awards program to recognize public and private sector organizations and individuals who demonstrated outstanding leadership in the national effort to achieve energy efficiency.

NRA qualified for the residential portion of the award with its Consumer Awareness Program for Energy Management (CAP'EM) that began in 1979. CAP'EM made available to restaurants such energy conservation items as "Energy IQ" placemats with a question and answer format on how to save energy; take-home checklists containing 55 tips and facts on saving energy; and a host of other conservation materials ranging from coasters and table tents to posters and bumper stickers. The program was expanded last year to include state restaurant associations, and new placemats will be available later this year.

Bradford to Head NRA

Robert E. Bradford, Executive Vice President of the Food Marketing Institute, Washington, D. C., is the new Executive Vice President of the National Restaurant Association (NRA).

Robert Neville, NRA Chief Counsel, has been serving as Acting Executive Vice President since the resignation of chief staff executive Brian G. Harron, July 1, 1980.

Bradford, a native of Virginia, joined the Food Marketing Institute as Vice President for Government Relations when it was founded through a merger in January, 1977. He became Executive Vice President in 1979. Bradford has held senior staff positions with the US House of Representatives, the US Senate and a major federal agency.

NRA offers Sanitation Manual

As an aid to restaurateurs in training personnel in the area of public health, the National Restaurant Association (NRA) has developed a comprehensive *Sanitation Operations Manual.*

The 400-page guide is a "how-to" manual addressing all types of sanitation problems. It comes in a binder format so updating is easy.

Included in the guidebook are 23 different checklists that can be reproduced on copying machines for continuing use.

Topics covered in the manual include Food Care, Personnel, Equipment, Facilities, Local Ordinances, Sanitation Programs, Foodborne Illnesses, and Microbiology.

To order the manual, send $7.95, plus 10% shipping and handling, to:

Educational Materials Center
National Restaurant Association
311 First Street, NW
Washington, DC 20001

Western Food Industry Conference Scheduled

The 10th Annual Western Food Industry Conference will be held March 31 and April 1 at University of California-Davis.

The conference updates and broadens the technical and scientific competence of Western food processing professionals.

The conference will open Tuesday, March 31st with a general session on the *Issues in Agriculture and Nutrition Affecting the Food Processing Industry.* Concurrent afternoon sessions will include a Dairy Session discussing *High Fructose Corn Syrup (HFCS),* an *Oil & Fats Update,* a session on *Quality Assurance,* and a session sponsored by the students in food technology and the student division of IFT. Late aftenoon on Tuesday will feature poster sessions and the California Dairy Industries Association Ice Cream and Milk Judging Contest.

Wednesday morning there will be three concurrent sessions: *Computer Use in Food Processing, Dairy Packaging,* and *Starches-All You Ever Wanted to Know.*

Afternoon sessions that same day will be: a *Critical Look at Grading,* a *Panel Discussion on Energy,* a *Cheddar Cheese Evaluation and Clinic* and the *Role of Enzymes and Quality Changes in Frozen Foods.*

The program will be complimented Tuesday by a session on *Tasting Habits and Dietary Guidelines for the Family* for the spouses and guests and in the evening by a Wine and Cheese Tasting, followed by a general conference banquet organized by the American Oil Chemists Society, Northern California Section. Wednesday evening there will be the Annual California Dairy Industries Association Awards Banquet.

The conference is planned by a committee representing the following organizations: Northern and Southern California Section of the Institute of Food Technologists, National Food Processors Association, USDA, Science & Education Administration, California Dairy Industries Association, the Northern California Section of the American Oil Chemists Society, in addition to the University of California, Department of Food Science & Technology and Cooperative Extension.

For further information contact: John C. Bruhn, Chairman or Shirley Rexroat, Program Assistant, Department of Food Science and Technology, University of California, Davis, CA 95616, 916-752-2191 or 2192.

"Mini-lessons" offered by NSF

A training supplement, "Taking Care of Food Temperatures" is available from the National Sanitation Foundation.

The contents of this package may be used as "mini-lessons," new employee orientation, aid to expand on company policy, newsletters, or posters for bulletin boards. Eight segments are included.

The purpose of the series is to provide foodservice managers/supervisors, having completed a sanitation certification program, with ammunition to take back to their staff for continued on-the-job orientation.

The Mini-Lessons Series is in two parts--the first is a finished set on color which may be used directly. The second is a camera-ready copy that the user agency or organization can reproduce as they wish. These may be personalized, expanded, or modified by the user to fit particular situations.

This set is a companion to the instructional guide, "Temperature Control in Food Service."

This lesson set may be obtained by sending $3.50 to:

Education Service
National Sanitation Foundation
P. O. Box 1468
Ann Arbor, Michigan 48106
313-769-8010

ADMI, WPI to Meet Jointly

The 56th Annual Meeting of the American Dry Milk Institute and the 10th Annual Meeting of the Whey Products Institute will be held jointly at the Marriott O'Hare Hotel, Chicago, IL, on April 22-24, 1981.

All dry milk and whey product manufacturers, allied industry friends interested in processing and marketing of these products, and representatives from government and universities are cordially invited to attend the meetings.

General Sessions will present knowledgeable speakers from industry, government, universities and the Institute's staff, who will discuss topics of current interest to manufacturers and users of dry milk and whey products.

For additional information about this joint Annual Meeting, contact: Dr. Warren S. Clark, Jr., Executive Director of ADMI and WPI, 130 N. Franklin St., Chicago, IL 60606.

USDA Proposes Fumaric Acid for Meat Curing List

The USDA has proposed adding fumaric acid to the list of substances approved for reducing curing time in meat and poultry and their byproducts.

Donald L. Houston, administrator for USDA's Food Safety and Quality Service, (FSQS) said the proposal classifies fumaric acid as a cure accelerator which must be combined with a curing agent for the purpose of fixing color in meat and poultry products.

Fumaric acid occurs naturally in many plants, and is produced commercially from glucose with the use of fungi.

According to Houston, FSQS tests have confirmed that fumaric acid permits the use of higher temperatures in the curing process, thereby reducing the time needed for curing and developing color. The substance also aids the peeling of cooked sausages, making automatic peeling machines more efficient, he said.

Fumaric acid has been approved by the FDA for use in non-meat food products. FSQS, under provisions of the Meat and Poultry Products Inspection Acts, approves substances used in processing meat and poultry products.

Comments on the proposal should be sent in duplicate by April 6, 1981 to the Executive Secretariat, Room 3807-S, FSQS, USDA, Washington, D.C., 20250.

Kultures & Kurds Klinic Set

The 1981 American Cultured Dairy products Institute Kultures and Kurds Klinic will be held March 23-25, according to Institute Operations Secretary Dr. C. Bronson Lane. The site for the event is the El Tropicano Hotel, San Antonio, TX.

The objective of the training endeavor is to update cultured product processors and allied tradesmen on new technology, effective quality control programs, culture developments, whey utilization, and innovative product formulations.

The national judging contest will be held in conjunction with the Klinic. Buttermilks, sour creams, yogurts, and cottage cheeses submitted by manufacturers will be evaluated by experts. The winner of this contest will receive the Neil C. Angevine Superior Quality Award.

Conferees will also be given opportunity to tour the H. E. Butt Grocery Co.'s new cultured food processing facilities in San Antonio.

For further information and/or advance registration materials, contact Margie Puglisi, ACDPI, 910-17th Street, N. W., Washington, D. C. 20006 or Dr. C. Bronson Lane, ACDPI, P. O. Box 7813, Orlando, Florida 32854.

Schools to Receive Food Safety Materials

Every public and private elementary and secondary school in the country received copies of USDA's new classroom materials on food safety and quality. The packages in this new outreach effort are:

- "Taking a Look at Food Quality" for grades four through six;
- "A Food-Safe Plan" for grades four through six; and
- "Food Safety: Your Responsibility" for grades seven through twelve.

Each education package includes a teacher's guide, reproducible activity masters, and a two-sided, color wall chart. Current teaching techniques are used in the lessons, with games, puzzles, and other visuals to enhance the learning process.

For years, the Department has provided the public with tips on buying food and keeping it safe to eat. Most of this information has been geared to adults. If elementary and secondary school teachers wanted to include this information in their curricula, they had to develop their own lesson plan. The ready-to-use lessons on food safety and quality are for children who may help their families shop for and handle food.

Food Service Sanitation Notes

Food Service Sanitation Notes *is written by the National Sanitation Foundation. Write to the NSF with your questions on food service sanitation, problems for which you need answers, or issues you feel should be aired. They'll be included in a future issue of* Dairy and Food Sanitation.

Q. Are cement asbestos decks acceptable in pizza ovens?

A. Yes. However, they are not acceptable for direct food contact applications.

Q. Why are ventilation hoods listed by NSF not rated for performance?

A. NSF currently evaluates ventilation hoods under Standard No. 2 for sanitary design and construction. NSF worked with an industry task committee and the Joint Committee on Food Service Equipment in an attempt to develop a performance standard.

Ventilation hoods are subject to demands and variations within individual installations. These individual variations require specific engineering and testing on site to determine if they will function properly. After much deliberation and trials in the laboratory, it was the consensus of the committee that a meaningful standard could not be reached.

Q. Why are floor drains in reach-in refrigerators not permitted in NSF Standard No. 7?

A. The subject has been reviewed by the Joint Committee on Food Service Equipment on several occasions, with the final consensus eliminating the drains. The basic reasoning has been that the high probability of direct connection presents a distinct hazard. The design of modern equipment and degree of humidity control is such that the need for drainage is minimized.

Q. Are the double check valves a good idea on water lines to ice machines?

A. The general answer is NO. A "cuber" machine will have a fill tank; therefore, an air gap is built in. The "flaker" machine should be equipped with a vacuum breaker. Under NSF Standard No. 12, a double check valve is not considered acceptable for back flow protection for ice machines.

NOW IT'S YOUR TURN!

Q. What is a practical way to keep waffle batter at proper temperature at the counter while preparing waffles?

We were not able to come up with a good summary answer.

WHAT DO YOU SAY? WHAT HAVE YOU SEEN WORK WELL?

ADDRESS any problems or questions you wish to have clarified or answered to:
Food Service Sanitation Notes
National Sanitation Foundation
P. O. Box 1468
Ann Arbor, Michigan 48106
Selected responses will be published in a scheduled issue of *Dairy and Food Sanitation.*

Food, Related Industries More Energy Efficient

Improved energy efficiency of 15.4 percent from 1972 through 1979 in the ten US industries which are the heaviest consumers of energy was reported by the US Department of Energy (DOE). Among these industries are food and related products industries.

Of the ten industries, five, including food and related products, chemicals, petroleum, transportation equipment and machinery, had surpassed their 1980 efficiency targets by the end of 1979.

This information, as well as other data on industrial energy use, are included in DOE's third "Annual Report to the Congress and the President on the Industrial Energy Efficiency Improvement Program."

The top ten energy use industries have reduced their energy demands since 1972 by an amount equivalent to more than one million barrels of oil per day, compared to the energy that they would have used at 1972 efficiencies, the DOE reported. These industries also achieved a 2.25 percent absolute reduction in energy consumption, compared to 1972 usage, during a period when output in manufacturing industries rose by over 17 percent.

Copies of the report may be obtained by writing to the Office of Industrial Programs (CS-40), Industrial Reporting Branch, US DOE, Mail Station 2H-085, Washington, DC 20585, 202-252-2371.

Calendar

Feb. 15-18---NATIONAL MASTITIS COUNCIL MEETING. Executive Inn, Louisville, KY. Contact: John Adams, NMC, 30 F Street NW, Washington, DC 20001.

Feb. 23-25---1981 EDUCATIONAL CONFERENCE FOR FIELDMEN AND SANITARIANS. Ramada Inn, Hurstborne Lane, Louisville, KY. Contact: W. Dale Marcum, 239 Woodhill Lane, Frankfort, KY 40601.

Feb. 23-25--SENSORY EVALUATION METHODS. Atlanta, GA. Shortcourse sponsored by IFT. Fee: $200. Hotel Reservations: Hyatt Regency Hotel, 265 Peachtree St. NE, Atlanta, GA 30303. Registration: Institute of Food Technologists, 221 N. LaSalle St., Chicago, IL 60601.

Feb. 24-25---DAIRY INDUSTRY WORKSHOP, sponsored by Virginia Association of Sanitarians and Dairy Fieldmen. Donaldson Brown Continuing Education Center, Virginia Polytechnic Institute and State University, Blacksburg, VA 24061, Contact: W. J. Farley, Secretary-Treasurer, AVSDF, Rt. 1, Box 247, Staunton, VA 24401.

Feb. 23-March 6---ADVANCED MICRO-ANALYTICAL SANITATION. Two-week course, sponsored by American Association of Cereal Chemists. Course will be held at O'D . Kurtz Associates, Inc., Melbourne, FL. Fee: $1000. Contact: Ruth Nelson, Short Course Coordinator, AACC, 3340 Pilot Knob Road, St. Paul, MN 55121, 612-454-7250; or James W. Gentry, O'D. Kurtz Associates, Inc., 2411 S. Harbor City Blvd., Melbourne, FL 32901, 305-723-0151.

March 3---9th ANNUAL FOOD SCIENCE SYMPOSIUM. Theme: "Food and Your Well-Being: Are Processed Foods All that Bad?" Sponsored by University of Georgia Student Chapter of IFT. Georgia Center for Continuing Education, University of Georgia. Contact: Nancy Brach, Symposium Coordinator, Food Science Dept., University of Georgia, Athens, GA 30602.

March 4---SOUTHERN CALIFORNIA FOOD PROCESSORS SANITATION WORKSHOP. Inn at the Park, Anaheim, CA. Contact: Paulette De Jong, Food Science and Technology, University of California, Davis, CA 95616, 916-752-1478.

March 10---DAIRY PROCESSORS CONFERENCE. Sponsored by Dept. of Food Science, University of Wisconsin-Madison. Contact: M. P. Dean, Dept. of Food Science, University of Wisconsin, Madison, WI 53706.

March 10-11---NEW YORK STATE CHEESE MANUFACTURERS' ASSOCIATION, ANNUAL CONFERENCE. Hotel Syracuse, Syracuse, NY. Contact: D. K. Bandler, 11 Stocking Hall, Cornell University, Ithaca, NY 14853.

March 11-13---PRACTICAL STATISTICAL METHODS FOR THE FOOD, DRUG AND COSMETIC INDUSTRIES. Holiday Inn, Mundelien, IL. Sponsored by Northeastern Illinois Section and the Food, Drug and Cosmetic Division, American Society for Quality Control. Contact: Keith Bitzinger, Abbott Laboratories, Dept. 916, Abbott Park, North Chicago, IL 60064, 312-937-4975.

March 15-18---23rd ANNUAL MEAT SCIENCE INSTITUTE. Sponsored by the Food Science Division, University of Georgia and the National Independent Meat Packers Association. Center for Continuing Education, University of Georgia. Contact: J. A. Carpenter, Food Science Dept., College of Agriculture, University of Georgia, Athens, GA 30602.

March 16-17---29th ANNUAL FOOD TECHNOLOGY CONFERENCE. Cosponsored by the St. Louis and Kansas City Sections of IFT and the Dept. of Food Science of the University of Missouri. Theme: "Food Ingredients--New Sources, Functionality, Cost Reduction, Nutrition, Toxicology and Availability." University of Missouri, Columbia. Contact: W. Snyder, Secretary, St. Louis Section of IFT, 2526 Baldwin St., St. Louis, MO 63106.

March 23-25---PESTICIDE RECERTIFICATION COURSE. Atlanta, GA. Sponsored by American Institute of Baking. Contact: AIB, 1213 Bakers Way, Manhattan, KS 66502.

March 23-25 AMERICAN CULTURED DAIRY PRODUCTS INSTITUTE ANNUAL TRAINING SCHOOL AND JUDGING CONTEST. El Tropicano Hotel, San Antonio, TX. Contact: C. Bronson Lane, ACDPI. PO Box 7813, Orlando, FL 32854.

March 23-27---MOLDS AND MYCOTOXINS IN FOODS. Short course sponsored by American Association of Cereal Chemists and the University of Minnesota. Course will be held at Coffey Hall, 1420 Eckles Ave., Univesity of Minnesota, St. Paul, MN 55108. Course fee: $375. Contact: Ruth Nelson, Short Course Coordinator, AACC, 3340 Pilot Knob Road, St. Paul, MN 55121, 612-454-7250, or Office of Special Programs, 405 Coffey Hall, 1420 Eckles Ave., University of Minnesota, St. Paul, MN 55108, 612-373-0725.

March 25-27---SOUTHEASTERN REGIONAL LABORATORY DESIGN SEMINAR. Atlanta, GA. Fee: $400. Contact: Norman V. Steere & Associates, Inc., 140 Melbourne Ave., SE, Minneapolis, MN 55414, 612-378-2711.

March 31-April 1---WESTERN FOOD INDUSTRY CONFERENCE. Freeborn Hall, University of California, Davis. Contact: John C. Bruhn, Chairman, or Shirley Rexroat, Program Assistant, Dept. of Food Science and Technology, University of California, Davis, CA 95616, 916-752-2192 or 2191.

April 6-7---WAREHOUSE AND RETAIL STORE SANITATION. Manhattan, KS. Course sponsored by American Institute of Baking. Contact: AIB, 1213 Bakers Way, Manhattan, KS 66502.

April 12-15---DAIRY AND FOOD INDUSTRIES SUPPLY ASSOCIATION, 62nd Annual Meeting. Hyatt Hilton Head, Hilton Head, SC. Contact: Dairy and Food Industries Supply Association, Inc. 5530 Wisconsin Ave., Washington, DC 20015.

April 13-15---PESTICIDE RECERTIFICATION. Hershey, PA. Course sponsored by American Institute of Baking, 1213 Bakers Way, Manhattan, KS 66502.

May 11-13---QUALITY CONGRESS. Sponsored by the American Society for Quality Control, in cooperation with the 5th Triennial Conference of the International Academy of Quality. San Francisco, CA. Contact: D. C. Schmidt, Manager, Public Relations, American Society for Quality Control, 161 W. Wisconsin Ave., Milwaukee, WI 53201.

May 12-14---36th ANNUAL PURDUE INDUSTRIAL WASTE CONFERENCE. Stewart Center, Purdue University, West Lafayette, IN. Contact: J. D. Wolszon, Purdue Industrial Waste Conference, Civil Engineering Bldg., Purdue University, West Lafayette, IN 47907.

May 13-15---3A SANITARY STANDARDS COMMITTEE MEETINGS. Galt House, Louisville, KY. Contact: Harold Thompson, DFISA, 5530 Wisconsin Ave., Room 1050, Washington, DC 20015.

May 16-20---61st ANNUAL NATIONAL RESTAURANT SHOW. McCormick Place, Chicago, IL. Contact: NRA Convention Dept., One IBM Plaza, Chicago, IL 60611.

May 18-21---INTERSTATE MILK SHIPPERS CONFERENCE. Hot Springs, AK. Contact: Herb Vaux, Indiana State Board of Health, 1330 W. Michigan St., Indianapolis, IN 46206.

May 27-29---AMERICAN SOCIETY FOR QUALITY CONTROL, 36th Annual Quality Congress San Francisco, CA. Hilton & Tower. ASQC, Dept. PI-1000, 161 W. Wisconsin Ave., Milwaukee, WI 53202.

June 8-10---AIB/FDA SANITATION AND QUALITY ASSURANCE MANAGERS WORKSHOP. Chicago, IL. Course sponsored by American Institute of Baking, 1213 Bakers Way, Manhattan, KS 66502.

July 13-15---PRINCIPLES OF QUALITY ASSURANCE. Washington, DC. Course sponsored by American Institute of Baking, 1213 Bakers Way, Manhattan, KS 66502.

Study Shows Alternatives in Broiler Harvest

Mechanical harvesting of broiler chickens produces more high-quality carcasses at substantial economic savings and is more humane than hand catching. This is the finding of a University of Maryland Agricultural Experiment Station agricultural engineer who is studying mechanical alternatives to traditional methods of hand-catching and loading broilers.

Assistant professor Ali Farsaie and his colleagues designed and tested two mechanical devices for catching and loading broilers in response to the growing desire for methods that are less costly, less damaging and that require less manpower than do traditional methods. Currently broilers are caught and loaded into chicken coops by hand.

In one test, broilers were caught by scoop on a front-end loader. An average of 55 broilers were caught with the scoop and carried to the bed of a live-haul truck. There, they were gently removed one by one and placed in chicken coops.

Another group of broilers were gently picked up by hand and placed into crates inside the broiler house. Eighty-eight crates were caught by the front-end loader method and 84 were caught by hand. The broilers sustained less bruising from the "scoop" method than they did by the traditional method.

In the other test, broilers were caught by the scoop attached to the front-end loader and then dumped onto a long conveyor. They moved along the conveyor to the truck, where they were hand-loaded individually into coops.

One hundred crates of broilers were loaded using this method, while another 104 crates were loaded by hand. Again, the broilers sustained less bruising from the scoop and conveyor method than they did by the traditional method.

The mechanical broiler harvesting system--which is still under development--will require nine persons, two fewer than the normal 11-person crew used in traditional hand-catching procedures. Farsaie estimates that about $11,000 per crew person will be saved annually.

Furthermore, less bruising will produce a corresponding increase in the number of Grade A broiler carcasses, Farsaie says. This development would increase profits by about $22,500 per year for one operation alone.

Toxic Substance Specialists Listed in New Guide

A 180-page guide to specialists on toxic substances--*Contact: Toxics*--has been published by the non-profit, non-advocacy World Environment Center. It provides access to nearly 1,000 specialists on toxic substances.

Contact: Toxics lists the names, addresses, telephone numbers and professional profiles of experts involved in the manufacture, handling and disposal of toxic substances.

The specialists are drawn from the private sector, government, scientific and academic institutions, environmental organizations and labor unions. As a public service, all of them have agreed to respond to queries from journalists and professionals working in the field.

Contact: Toxics covers 34 major areas and over 400 sub-categories of toxic substances. In addition to providing an alphabetical listing of specialists, it is also cross-indexed by field of expertise and geographical area, and includes

- a technical glossary
- a list of acronyms
- a table of priority pollutants and their sources
- a chronology of major Federal Acts governing toxic substances
- a directory of emergency and information hot-line telephone numbers

Major funding for *Contact: Toxics* came from the National Science Foundation. Additional underwriting has been received to send one free copy of the guide to 2,000 daily newspapers and radio and TV newsrooms. For professionals in government and industry the price is $49.50; the cost for non-profit organizations is $37.50.

Copies of *Contact: Toxics* are available from the World Environment Center, 300 East 42nd Street, New York, NY 10017, 212-697-3232.

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Whirlpool, Hot Tub Use Increases

The increasing popularity of health spas and racquetball clubs plus the demand by the public for these facilities in lodging establishments has led to the installation of whirlpools and hot tubs. Many whirlpools and hot tubs have been installed in Pennington County in the last couple of years and many more inquiries have been made by motels for the requirements for operating these installations. Because these are semi-public bathing areas, the operators should be instructed on the proper maintenance of their facility.

Circulation and filtration systems are necessary to insure safe bacteria and algae levels. The materials used in these systems should comply with the requirements of the National Swimming Pool Institute-National Sanitation Foundation. The chemical feeding equipment should also conform to these standards. All bactericidal agents should be approved by the Department of Environmental Protection. Since chlorine is the most frequently used bactericidal compound, a DPD test kit is recommended to check the free chlorine residual in their facilities.

High water temperatures, up to a maximum of 105°F, allows for the rapid evaporation of chlorine from the water. A free chlorine residual of 1.0 to 3.0 ppm should be maintained to handle these small-water volume and high-bather use facilities. These installations should be super chlorinated if bacteria counts exceed Health Department requirements or if algae growth is observed. The water should be drained and the walls of the facility washed at least once a week to minimize algae buildup. The pH of the water should be maintained from between 7.2 and 7.8 to assure chlorine efficiency and minimize scale formation and corrosion of metals.

Recent pseudomonas infections caused by unsanitary whirlpools in the Rapid City area demonstrates that routine sampling of these spas is necessary. The water in these facilities must meet The Department of Environmental Protection regulations on potable water. Water samples should be submitted weekly for total coliform analysis to insure that a safe environment is being maintained.

Reprinted from "Horizons" South Dakota Environmental Health Association.

JFP Abstracts

Abstracts of papers in the February Journal of Food Protection

Factors Affecting Death of Yeast by Sulfur Dioxide[1], A. D. King, Jr.*, J. D. Ponting, D. W. Sanshuck, R. Jackson and K. Mihara, Western Regional Research Center, Science and Education Administration, U.S. Department of Agriculture, 800 Buchanan Street Berkeley, California 94710.

J. Food Prot. 44:92-97

The interrelated factors that influence the effectiveness of SO_2 as a preservative against yeast were studied and the correct quantitative relationships of SO_2 molecular species determined. Widely differing pK values for SO_2 were found in the literature, compared with experimental data, and one set of values was selected. Undissociated H_2SO_3 is the only effective form of SO_2 against yeast and can be calculated from measurement of free SO_2 and pH, and the correct dissociation constants. Duration of contact, pH, concentration of SO_2 and yeast, and binding of SO_2 all influence the preservative action of SO_2. Lower total SO_2 concentrations can be used for food preservation by optimum control of these factors.

Microbiological Analysis of Alligator (*Alligator mississippiensis*) **Meat**, J. L. Oblinger[2]*, J. E. Kennedy, Jr.[2], E. D. McDonald[3], and R. L. West[3], Food Science and Human Nutrition Department and Animal Science Department, University of Florida, Gainesville, Florida 32611.

J. Food Prot. 44:98-99

The two tail muscles, ilio caudalis and ischio caudalis, along with hide surface areas from four alligators, *Alligator mississippiensis*, were evaluated for microbial numbers and types. Microbial analyses of hide surfaces yielded a mean aerobic plate count (APC, 35 C) of approximately 4.45 logs/cm² at 35 C, and total coliform counts were low. *Salmonella* was not recovered from hide or tissue samples. APCs of fresh meat samples were low (2.88 - 3.02 logs/g) regardless of muscle type with no recovery of fecal coliforms or *Escherichia coli*. Microbial development in meat stored at 1.7 C for up to 15 days was comparable to that reported for fresh beef. Typical microorganisms recovered included *Corynebacterium, Staphylococcus, Micrococcus, Flavobacterium, Pseudomonas, Acinetobacter, Arthrobacter* and yeasts.

Bacteriological Control of Food Equipment Surfaces by Cleaning Systems. III. Complementary Cleaning, D. G. Dunsmore[1]*, M. A. Thomson and G. Murray, National Dairy Laboratory, Ruakura A.R.C., Private Bag, Hamilton, New Zealand.

J. Food Prot. 44:100-108

Complementary use of alkaline and acidic detergents within one system for soak cleaning was examined. A cleaning simulator was used to determine the changes in soil and bacterial numbers on stainless steel and rubber surfaces over 28 soiling and washing cycles (each of 12 h) with four cleaning systems. The soiling milk was inoculated with 5×10^5 *Streptococcus faecalis* and 5×10^5 *Escherichia coli* colony forming units/ml. In one system the soiling milk was followed by a washed with a chlorinated-alkaline detergent (20 C) and two rinses of cold water (20 C) and an intercycle period of 9.5 h. The second system was the same as the first, except an acidic detergent (20 C) was substituted for the final rinse every 9th cycle. In the third system, the same acidic detergent was used in every cycle, and in the fourth, an iodophor was used as the final solution in every cycle. The experiment demonstrated that the complementary use of alkaline and acidic detergents is ineffective in the soak-cleaning situation as acidic detergents aggravate accumulation of soil under these circumstances. Although the periodic application of a sanitizer did not influence soil accumulation, it transiently affected numbers and types of microorganisms on the surfaces. Under these conditions, the efficiency in bacterial control of the four systems was related not to the detergency, but to the performance of the sanitizer used in the system. The two substrates varied greatly in the absolute and relative amounts of soil which were deposited upon them - these differences affecting the numbers of bacteria which the surfaces supported. Neither *S. faecalis* nor *E. coli* grew during the intercycle period of any system (9.5 h, RH 90%, 30 C).

Preprocess Holding of Squid (*Illex illecebrosus*) **and Quality of Canned Mantles**, Bohdan M. Slabyj* and Ruth H. True, Department of Food Science, University of Maine, Orono, Maine 04469.

J. Food Prot. 44:109-111

Shelf life of brine refrigerated whole squid (*Illex illecebrosus*) was about 3 days at 7.2 C and 5 days at 0.6 C. No difference in keeping quality was detected when using 3 or 12% brine. Salt-requiring, heat-sensitive bacteria predominated in the spoilage flora. Sensory evaluation of whole squid and canned mantles showed significant correlations with trimethylamine-nitrogen and tyrosine content of the raw material. Precanning blanching caused 37% shrinkage and 15% loss of dry matter in fresh squid, which increased with preprocess storage conditions to a maximum of 56% shrinkage and 42% loss of dry material.

Hydrolysis of 2-Chloroethyl Palmitate and 2-Chloroethyl Linoleate by Mammalian Enzymes, John J. Sullivan* and John J. Majnarich, BioMed Research Laboratories, 1115 East Pike Street, Seattle, Washington 98122.

J. Food Prot. 44:112-114

Hydrolysis of 2-chloroethyl palmitate and 2-chloroethyl linoleate was studied in artificial gastric juice, artificial pancreatic juice, pig liver homogenates and pig intestine homogenates. Hydrolytic activity was followed by gas-liquid chromatography. Substantial hydrolysis was observed in all

preparations except the artificial gastric juice. Hydrolysis constants ranged from <0.001 min^{-1} in the gastric juice to 0.064 min^{-1} for the linoleate ester in the pancreatic juice.

Mayonnaise, Sandwiches and *Salmonella*, B. Swaminathan*, J. M. Howe, and C. M. Essling, Department of Foods and Nutrition, Food Sciences Institute, Purdue University, West Lafayette, Indiana 47907.

J. Food Prot. 44:115-117

Sandwiches, prepared with home-cooked or commercially purchased turkey meat and made with or without commercially available mayonnaise, were inoculated with approximately 600-700 cells of a nalidixic acid-resistant strain of *Salmonella typhimurium* per gram of each sandwich. The sandwiches were incubated at 4, 21, and 30 C and samples analyzed at 4, 8 and 24 h for the number of *S. typhimurium* cells. Significant increases in the number of *S. typhimurium* cells were found in sandwiches prepared without mayonnaise and containing home cooked turkey meat after 8 h of incubation at 30 C and 24 h of incubation at 21 or 30 C. The increase in numbers of *S. typhimurium* in sandwiches prepared with commercially processed turkey meat was significantly lower than the increase in sandwiches prepared with home-cooked turkey meat. Mayonnaise had a significant inhibitory effect on growth of *S. typhimurium* in sandwiches prepared with turkey breast meat; however, mayonnaise did not prevent *Salmonella* from multiplying when the sandwiches were stored at 21 or 30 C for 8 or 24 h.

Hazard Analysis of Party-Pack Foods Prepared at a Catering Establishment, Frank L. Bryan[2]*, Mary Harvey[3,4], and Melvin C. Misup[5], U.S. Department of Health and Human Services, Public Health Service, Center for Disease Control, Atlanta, Georgia, 30333, Cook County Department of Public Health, Maywood, Illinois, 60153, and Division of Laboratories, Illinois Department of Public Health, Chicago, Illinois 60612.

J. Food Prot. 44:118-123

Foods prepared by a catering establishment were implicated as vehicles in five outbreaks of foodborne disease. Because of this, a hazard analysis was conducted consisting of (*a*) evaluation of product temperatures throughout processing and assembly, (*b*) pH measurements of the salad products and (*c*) testing samples of the products taken at various stages of processing for pathogenic foodborne bacteria. Temperatures of precooked roast beef were too low to allow growth of common pathogenic foodborne bacteria during thawing, slicing and packaging with gravy in a refrigerated room. Temperatures were also too low to allow multiplication of common pathogenic foodborne bacteria in prechilled, prepared salads during refrigerated storage, and there was too little time for multiplication of such organisms during party-pack assembly at room temperature. Chicken parts reached 74 C (165 F) or higher during cooking. While the cooked chicken was held for delivery in a small room that had a maximum temperature of 38 C (105 F), internal temperatures of the chicken did not fall below 82 C (180 F). Cooked chicken held 3 h and 15 min at room temperature (21 C/70 F) -- to simulate delivery and storage -- cooled to approximately 46 C (115 F). During simulated delivery, the temperature of the meat and gravy did not rise above 4 C (40 F). Approximately 1 h was required to reheat the meat and gravy to a temperature of 74 C (165 F) when two sterno cans were used. A 2.7-kg (6-lb) portion of leftover beef took 6.5 h to cool from 60 C to 7 C (140 F to 45 F). Guidelines for caterers and party hosts and hostesses are recommended.

Antibiotic Susceptibility Patterns of *Yersinia enterocolitica*, L. Restaino* and W. M. Hill, Armour Research Center, 15101 North Scottsdale Road, Scottsdale, Arizona 85260.

J. Food Prot. 44:124-127

Antibiotic susceptibility patterns for *Yersinia enterocolitica* strains involving 10 different serotypes were analyzed and compared. All *Y. enterocolitica* were susceptible to colistin, gentamicin, kanamycin, neomycin and doxycycline, whereas all isolates displayed resistance to penicillin G, methicillin (derivative of penicillin), novobiocin, and clindamycin. The antibiograms for the *Y. enterocolitica* isolates were in some instances related to the somatic serotypes, especially serotype 0:8 for which the antimicrobial susceptibility pattern displayed the greatest disparity. By eliminating the antibiograms for the four serotype 0:8 strains, antimicrobial susceptibility patterns for atypical and typical strains were similar.

Survival of *Streptococcus faecium* in Beef Loaf and Potatoes after Microwave-Heating in a Simulated Cook/Chill Foodservice System[1], C. A. Dahl[2], M. E. Matthews* and E. H. Marth, Department of Food Science, University of Wisconsin-Madison, Madison, Wisconsin 53706.

J. Food Prot. 44:128-133

This study evaluated survival of a radiation-resistant organism, *Streptococcus faecium*, as a potential indication of safety of beef loaf and potatoes after microwave-heating in a hospital cook/chill foodservice system. The cook/chill system was simulated in a laboratory three times for both beef loaf and potatoes. Beef loaf (15 kg) was initially cooked to 66 C in a convection oven (156 C), chilled 24 h at 6 C, cut into 100-g portions, inoculated on the external surface with *S. faecium* (1×10^8 CFU/g), chilled 2 h, and microwave-heated for 20, 50, 80 or 110 sec. Dehydrated potatoes (5.7 kg) were reconstituted to 79 C over direct heat, chilled to 37 C, inoculated internally with *S. faecium* (1×10^6 CFU/g), stored chilled 24 h at 6 C, portioned into 100 g/portion, chilled 2 h at 6 C and microwave-heated for 25, 45, 65 or 85 sec. Results indicated that increasing the time of microwave-heating for portions of beef loaf or potatoes decreased the count on KF agar regardless of internal or external inoculation procedure. Eighty or 85 sec of microwave-heating of beef loaf or potatoes resulted in portions with similar numbers of bacteria as determined by KF agar, but mean internal end temperatures ranged from 66 to 95 C.

Evaluation of Media Used in Rapid Methods for the MPN Enumeration of Fecal Coliforms in the Sydney Rock Oyster (*Crassostrea commercialis*), A. Rowse, Food Bacteriology Section, Division of Analytical Laboratories, Health Commission of New South Wales, Lidcombe, N.S.W., Australia 2141.

J. Food Prot. 44:134-136

MacConkey and A-1 broths were compared for the MPN enumeration of fecal coliforms in the Sydney Rock Oyster (*Crassostrea commercialis*), using an incubation regime of 2 h at 37 ± 1 C followed by up to 46 h at 44.5 ± 0.5 C. A higher recovery was obtained with MacConkey broth, with ratios of the geometric mean MPN values of 111 samples tested in A-1 and MacConkey broth of 0.5460 and 0.5654 after 24 h and 48 h incubation, respectively. Incubation for 48 h produced significantly higher counts than 24-h incubation for both broths.

Aflatoxin Production in Khoa, A. F. Lembhe[1], B. Ranganathan[2]*, M. V. Ramana Rao and L. Krishna Rao, Division of Dairy Bacteriology, National Dairy Research Institute, Karnal-132 001 (Haryana), India

J. Food Prot. 44:137-138

Aspergillus parasiticus NRRL 2999 and *Aspergillus flavus* K_3 were examined for aflatoxin production in khoa. The inoculated khoa samples were examined after incubation for 2 weeks at 5, 28 and 37 C. Aflatoxin penetrated to a depth of 4 cm in the inoculated khoa samples stored at 28 and 37 C.

Microbial Quality of Ground and Comminuted, Raw and Cooked Turkey Meat[1], G. A. McKinley and J. S. Avens*, Department of Animal Sciences, Colorado State University, Fort Collins, Colorado 80523

J. Food Prot. 44:139-143

The microbial quality of ground and comminuted turkey meat was examined using raw meat and meat after two cooking times. Eight triplicate samples were obtained from a commercial processing plant over an 8-month period and analyzed for aerobic plate count (APC), coliforms, *Escherichia coli, Staphylococcus aureus, Clostridium perfringens* and *Salmonella*. The APC for 29% of the raw ground and 0% of the raw comminuted turkey meat samples was greater than 5.0×10^6/g. Raw ground and comminuted meat yielded a mean coliform most probable number (MPN) of 2.2×10^2 and 6.2×10^2/g respectively. Mean *E. coli* MPNs per gram were 12 for raw ground and 49 for raw comminuted meat. Twenty-five percent of the 24 raw ground samples, and 46% of the comminuted samples exceeded 50 *E. coli* MPN/g. *S aureus* was isolated from 25% of the raw ground and 54% of raw comminuted samples. Salmonellae were isolated from 8% of the raw ground samples and 12% of raw comminuted samples. *C. perfringens* was isolated from 50 and 55% of 40 ground and 40 comminuted meat samples, respectively. Cooking reduced the microbial numbers and isolation frequency from all samples.

Thermophilic Organisms Involved in Food Spoilage: Thermophilic Anaerobes not Producing Hydrogen Sulfide, D. H. Ashton, Hunt-Wesson Foods, Research and Development Department, 1645 West Valencia Drive, Fullerton, California 92634

J. Food Prot. 44:146-148

Clostridium thermosaccharolyticum is the type species of thermophilic anaerobes not producing H_2S. This organism is obligately anaerobic and produces abundant gas from a variety of carbohydrates, giving rise to hard swell spoilage in canned foods. The organism occurs widely in nature and is found in numerous ingredients used in the manufacture of canned foods. Its growth temperature optimum is 55 C, with growth at 35-37 C if spores are first germinated at a higher temperature. The spores possess high heat resistance, a property which is complicated by the fact that their characteristic z value is often as low as 6.7 C, leading to underestimates of resistance by processes based on a z of 10 C. A medium consisting of peas in 2% peptone is the substrate of choice for detection and enumeration of the non-hydrogen sulfide producing thermophilic anaerobes. *C. thermosaccharolyticum* produces neither infections nor toxins, and therefore is of spoilage but not of public health significance. Survival of its spores in canned foods is of no consequence unless cans are inadequately coded and/or are stored at temperatures above 35 C for extended periods.

Thermophilic Organisms in Food Spoilage: Sulfide Spoilage Anaerobes, Robert V. Speck, Campbell Institute for Research and Technology, Campbell Place, Camden, New Jersey 08101

J. Food Prot. 44:149-153

The history of sulfide spoilage in canned foods is traced from its earliest reported occurrence in an Iowa cannery in 1919 through several outbreaks in the midwest and east in 1945. The taxonomy of the causative organism, beginning with the name, *Clostridium nigrificans,* proposed by Werkman and Weaver in 1927, and ending with *Desulfotomaculum nigrificans* introduced by Campbell and Postgate in 1965, is discussed. Mention is made of the kinds of canned foods that have been involved in sulfide spoilage, and the spoilage characteristics, such as appearance, odor, pH, etc. exhibited by spoiled product. The morphology, staining characteristics, and culturing methods are discussed. Methods of analysis of common canned food ingredients such as sugar, flour, starch and nonfat dry milk are presented. A brief account of the thermal resistance of the spores of *D. nigrificans* is also given. Ingredient and equipment contamination and spoilage prevention are discussed in detail.

Thermophilic Organisms Involved in Food Spoilage: Aciduric Flat-Sour Sporeforming Aerobes, P. J. Thompson, The Gerber Products Company Research Center, Fremont, Michigan 49412

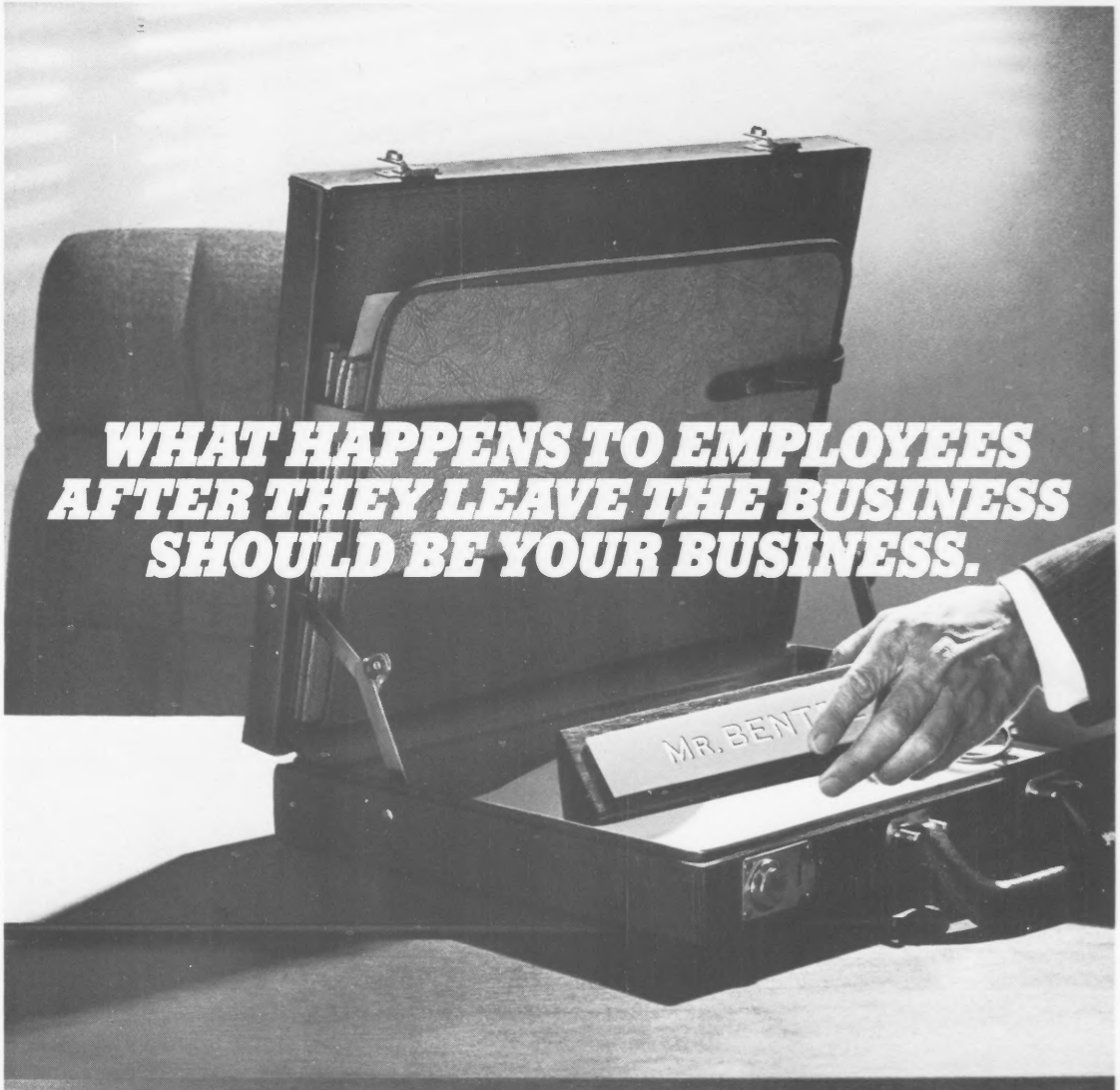
J. Food Prot. 44:154-156

This is an abbreviated review of the aciduric bacterium, *Bacillus coagulans*, and its relation to flat sour spoilage of medium acid foods. Spore heat resistance, lack of health hazard potential, identification and cultural requirements as well as spoilage prevention and heat processing are selectively reviewed. Eliminated from discussion are a large number of publications dealing with physiology, genetics and thermal death kinetics of the organism and its spores.

Thermophilic Organisms in Food Spoilage: Flat-Sour Aerobes, Keith A. Ito, National Food Processors Association, 1950 Sixth Street, Berkeley, California 94710.

J. Food Prot. 44:157-163

Bacillus stearothermophilus is the typical organism causing flat sour spoilage in low acid foods. It was first named by Donk. The spores are ubiquitous in nature, being isolated in areas from the arctic to the deserts as well as from foods. The organism is difficult to characterize in its growth, germination and sporulation requirements, and is difficult to destroy with heat or chemicals. The organism is not pathogenic.



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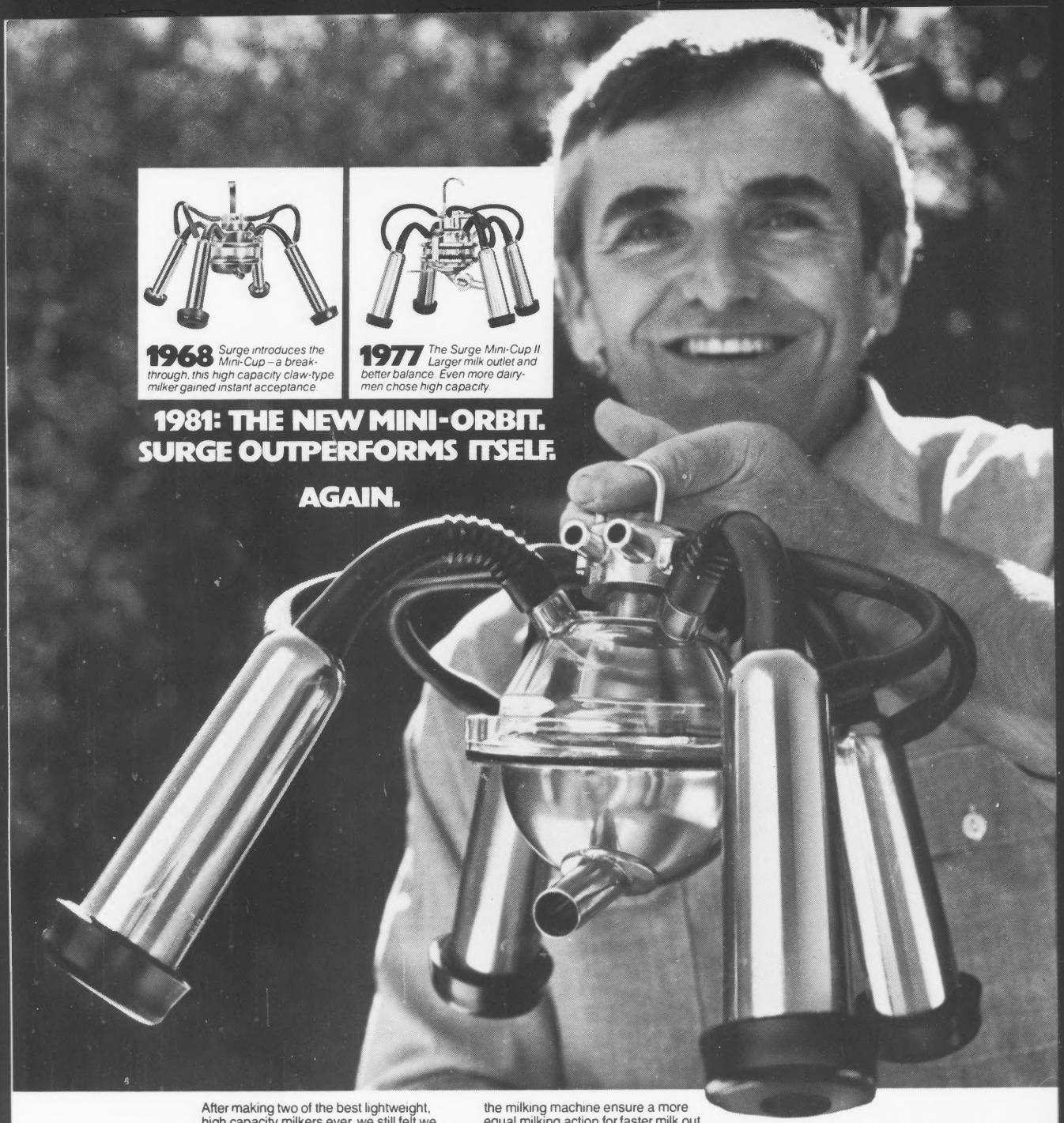

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