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Vol. 25

No. 11

*Journal of*

# MILK and FOOD TECHNOLOGY

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*Official Publication*

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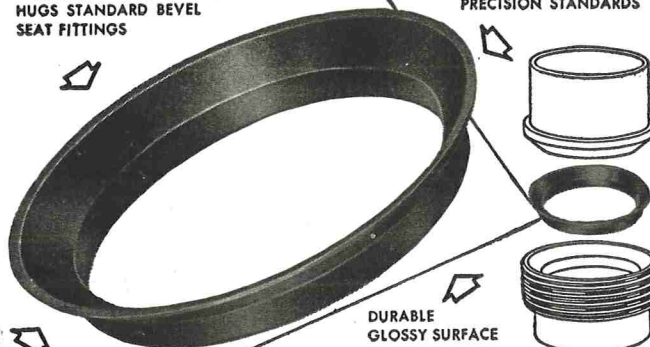
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Vol. 25 November, 1962 No. 11

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## Professional Development And Education Of Sanitarians

Looking back over the succession of events during the past six years while I served on the Executive Board of the International Association of Milk and Food Sanitarians, it is difficult for me to pinpoint particular events.

It does give me an opportunity, however, to consider the accomplishments I have seen relating to professional development and education of the sanitarian. Through IAMFS participation in the SANITARIANS JOINT COUNCIL, a uniform Registration Act has been devised. Planning for a National Intersociety Specialty Board is virtually completed. Efforts have been made to maintain adequate curricula for graduate training of sanitarians in our schools of public health—with fair to poor success.

The IAMFS Committee on Professional and Educational Development has worked hard and long to lend assistance to all sanitarians. Though frequently discouraged, they have simply redoubled their efforts, even knowing these might be to no avail.

My work with IAMFS and the responsibilities of my job have made it possible for me to visit all sections of the country. I have met and talked with sanitarians in nearly every state and in most of the major cities. Sanitarians *ARE* getting greater professional recognition. They *ARE* better educated, both prior to and following their employment as sanitarians. This fact *IS* recognized by those holding high administrative positions in public health—witness the number of sanitarians today who hold important administrative posts in local, state and other official agencies.

But, there is a large body of sanitarians who hold down jobs in which they simply make routine inspections day in and day out. They take their inspection sheet, flashlight, thermometer, and such other equipment as needed, make their rounds and turn in reports. This is important and necessary work: it is the only way that compliance with a wide variety of sanitary standards can be determined and maintained. Unfortunately, too many sanitarians appear content to go through the mechanics of checking off sanitary violations on a printed inspection form. This procedure is relatively simple. In fact, high school graduates can be quickly trained to do this. Assuming that they would simply tell the management, "You are not doing this in the manner prescribed by law," you might say they were doing the work of a sanitarian.

"Sanitarians" such as these are asking for professional recognition along with those who are rendering truly professional service. The former want and possibly deserve salary increases. The problem lies in the fact that they are making little or no personal effort to become "professional" in either their qualifications or their attitude toward public health work.

Such generalizations as the above are admittedly dangerous. There are many notable exceptions among the group limited in their activity to routine functions. Many sanitarians are qualified to do more technical work; though well qualified and ambitious they are frustrated because they see little chance for promotion in the organizational setup of their department. Many sanitarians employed by small local health departments find it difficult to get time off to attend public health meetings and seminars to develop themselves for greater responsibilities. They often must pay their own travel and living costs. These men need and should get all the help possible.

Let's face the fact, though, that too many sanitarians like a nine a.m. to five p.m. routine with little or no responsibility and few decisions to make. They are not inclined to make much effort to improve their knowledge or skills. Many of them are not even members of a state or regional association. Often those who do belong to an association do nothing more than pay their dues and occasionally attend a local meeting. They neither contribute to nor profit from the activities of their association.

There is no association, no state law, no committee or group of people that can do much to improve the professional status of such "sanitarians." Through our committees, our Executive Board and our affiliates we should do everything possible to improve the professional status and educational opportunities for all sanitarians.

Equally certain, it is time that some of those inclined to "rest on their oars" should pick up the stroke and help the team move toward its objective. You, the reader, can best judge whether or not you are doing your fair share. As a reader of the Journal of Milk and Food Technology and, presumably, a member of the International Association of Milk and Food Sanitarians or one of its affiliates, I suspect that you are doing your part. Now let's see you do one more thing. Call this to the attention of a sanitarian who can help but has not as yet made the effort he's capable of. Perhaps with your efforts and mine we can inspire him to help all sanitarians and thereby help himself.

WILLIAM V. HICKEY,  
Field Consultant  
Public Health Committee  
Paper Cup and Container Inst.  
250 Park Avenue  
New York 17, New York

# THE EFFECT OF AN EDUCATIONAL PROGRAM UPON THE SANITATION STANDARDS OF RESTAURANTS IN PEORIA, ILLINOIS<sup>1</sup>

RICHARD R. MARSH

*Department of Food Technology,  
University of Illinois, Urbana*

(Received for publication August 4, 1962)

A course in Food Service Sanitation was developed in 1953 by the Division of University Extension in cooperation with the Department of Food Technology, College of Agriculture, University of Illinois, Urbana. The course is of eight weeks duration with one two-hour session of class each week. Lecture, discussion, films, filmstrips, and slides are utilized in conducting the course. Enrollment is limited to restaurant managers and supervisory personnel.

Class topics include: Fundamentals of Nutrition, Fundamentals of Microbiology, Sources and Kinds of Additive Debris, Food Spoilage, Food-Borne Illnesses and Food Poisoning, Standards of Food Storage, Standards for Food Preparation, Standards for Food Serving, Good Housekeeping and Cleanup Techniques, Insect and Rodent Control, and Safety. Local and state laws pertaining to food service are fully reviewed in each class. An outline of the course and syllabus are furnished each enrollee.

Upon the successful completion of the course, each student is presented with an appropriate certificate by the University of Illinois, Division of University Extension.

Initial presentation of the course occurred in Chicago the spring semester of 1953-54, when a class of down-town restaurant managers was organized under the joint auspices of the Chicago Restaurant Association and the Chicago Board of Health. During 1953-54, four groups were given the course, three in Chicago and a city-wide class in Peoria, Illinois. By the end of the year 1960-61 the course had been given 90 times; 33 classes for commercial food service management, 31 classes for hospital food service, 21 classes for school lunch management, and 5 classes for food service personnel of Illinois penal institutions.

Between the years of 1953 and 1960 the course was presented 11 times in the city of Peoria. Since no advance notice had been given, it was decided that Peoria could well be the location for a study which would attempt to evaluate the impact of class

participation upon degree of compliance with the standard of food dispensing operations as established by the rules of the City of Peoria Food Ordinance<sup>2</sup>.

## METHODS AND MATERIALS

The restaurant inspectors of the City of Peoria use the inspection form recommended by the United States Public Health Service. The first 9 items on this form pertain to physical features of the establishment not readily modifiable by procedural studies. Items 10a to 17 and Section 9 (Disease Control) - a total of 15 items on the inspection report sheet - pertain to standards of day-to-day operation and therefore may be readily responsive to an instructional program.

Mean number of violations per inspection per year were calculated for each member of each group for the years 1952 through 1960. Since no classes were given prior to the year 1953-54, none of the restaurants would have participated in more than one class that year.

It should be noted that all city restaurant inspectors were required to take the course. Actually the inspectors have participated in all the courses offered in Peoria.

## RESULTS

It may be noted (Figure 1) that the mean number of violations per inspection of the nonparticipating restaurants (group B) declined during the years 1952-1960 from 4.46 to 1.70 (38.1%). This improvement in the sanitary condition of these establishments may have resulted from a combination of a number of factors. One may have been an awareness by managers of this group that the city health department was placing more and more emphasis upon maintenance of health standards within the public food service with resulting attention being paid more diligently to their compliance. Another factor may have been a direct result of the participation of the restaurant inspectors in the classes. Each inspector was required to attend one course. But, in fact, all the inspectors have participated in nearly

<sup>1</sup>This study is based upon data drawn from 1806 inspection reports of 64 firms participating in the program, compared with 1710 reports of 60 firms from the same geographical area of Peoria, Illinois, that did not participate during the years 1952-1960.

<sup>2</sup>Class membership was of two sources—those who wanted to participate, and those urged to participate because of conditions disclosed by inspection of their establishments.



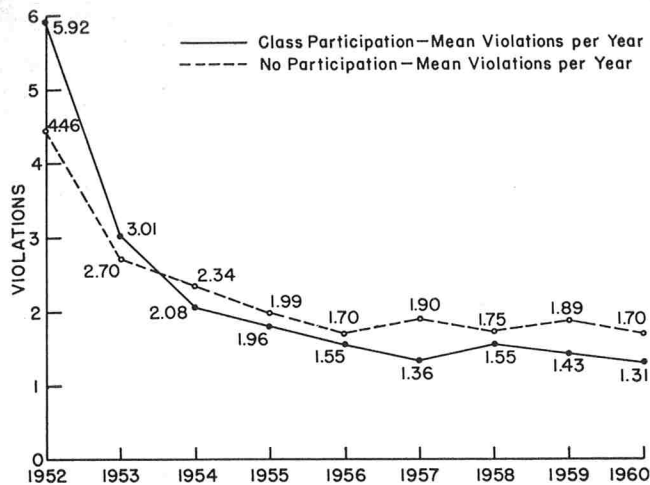


Figure 1. The mean number of violations per inspection of participating restaurants (Group A) and of non-participating restaurants (Group B) are compared through the years 1952-1960.

all of the courses presented in Peoria. A consequence of such active participation on the part of the inspectors may have been a shift in emphasis from a role of "checking the inspection sheet" to concern with correction and improvement; a shift from "policing" to "educating"; attention from *what* is in violation to *why* it is a violation, its significance, and what steps can and must be taken to maintain a satisfactory standard of operation.

We would like to believe that restaurant management by the nonparticipating group, may thus have been somewhat influenced both indirectly by the sustained and continuing educational program and directly by the understanding resulting from participation of the city inspectors in the classes. In any event, significant improvement can be noted in the group of institutions that never had participated in the course.

Mean violations of the participating group per year for the period 1952-1960 are compared with the mean violations of the nonparticipating group (Figure 1). Group A (participating) had a mean violation in 1952 of 5.92 per inspection (39.5%), compared to a mean violation of 4.46 (29.7%) among the non-participating group of restaurants (Group B). After initial class participation (1953-54) Group A dropped below Group B in violations and retained that relationship to the end of the study in 1960 where Group A had fallen to a 1.31 (8.7%) violations per inspection and group B to 1.70 (11.3%). Expressed another way, Group A improved 87.9% and Group B improved 62.9%.

In trying to pin-point the time of maximum impact within Group A, a comparison was made of mean violations before, during, and after class participation (Figure 2). Mean violations (Group A)

prior to *any* educational program (1962) was 5.92, and was plotted for each year for (a) those that had not yet participated, (b) those that were that year participating, and (c) those that already had participated. Obviously, only one mean figure was available in 1952.

Two additional means could be calculated for 1953 (had participated and were now participating). From 1954 through 1959 all three means of Group A could be plotted. But since our study stopped with 1959-1960, all of Group A would have participated by the end of 1960 and only one mean figure (1.31) would be available. Figure 2 therefore indicates the effect of participation on members of Group A. Violations after participation were consistently below violation means prior to participation. The immediate effect of being in the class is indicated by the line plotted for year of participation. With one exception, 1959, violations were less after having completed the class than during the year in which participation occurred.

#### EFFECT OF NUMBER OF CLASS PARTICIPATIONS

We next asked ourselves whether the number of classes in which the restaurant participated was associated with change in mean violations. Figure 3 indicates the impact of the number of classes of participation. Violations were at a higher initial level for those participating in more than one class (3.65, 5x; 10.16, 4x; 4.23, 3x; 4.20, 2x compared to 2.79, 1x). But the final mean index of that group having the highest initial index of 10.16 was 1.15 compared to the final mean index of Group B of 1.70 (Figure 1). All participants by numbers of classes involved (1 to 5 per restaurant) decidedly reduced their mean violations before, during, and after participations, to within 0.76 of a violation between greatest and least number of violations - 1960.

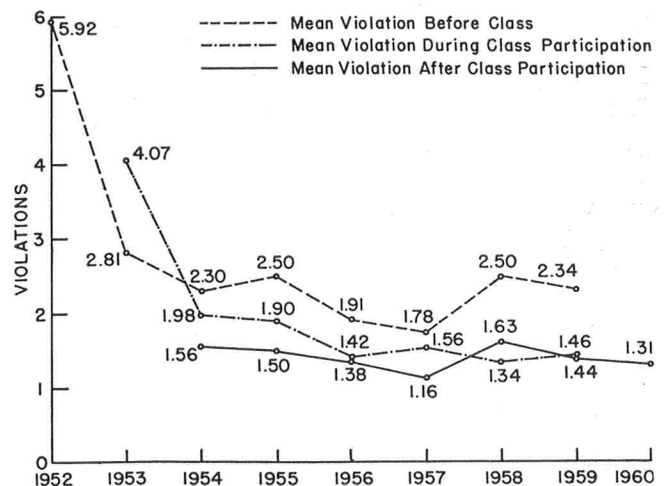


Figure 2. The effect of class participation upon violations of the restaurant sanitation code.

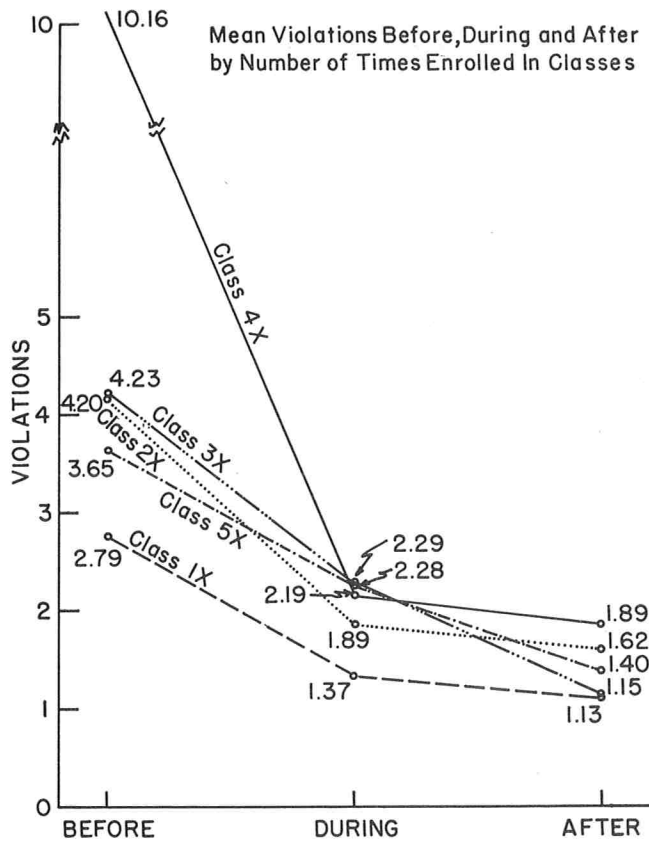


Figure 3. Effect of frequency of class participation upon violations of the restaurant sanitation code.

CLASS PARTICIPATION AND CONTINUITY OF OWNERSHIP

On the basis of data obtained from licensing records, a study was made of the number of times ownership of restaurants changed within Group A (participants) and Group B (nonparticipants) within the eight-year period. Table 1 shows this distribution. In Group B (total of 60) only 34 (56.67%) were under the same licensee in 1960 as in 1952.

Out of Group A (participants) only 6 out of 64 had changed owners, and only once. Fifty-eight of the 64 (90.62%) were under the same owner in 1960 as in 1952. Two conclusions may be drawn from these data: (a) the more serious management participated in the course and (b) principles of the course, applied to operations, retained customers and permitted the business to continue as a healthy operation.

In an attempt to evaluate sustained interest and acceptance of course content, certain class statistics were studied. From Table 2, it may be noted that some (15) apparently enrolled only to "please the inspector", 27 started the class but did not finish due to (a) transfer of job, (b) illness, and (c) lack of interest. Of the 319 who started the classes, 292 (91.5%) successfully completed the course. For a primarily voluntary course for which no academic

TABLE 1. NUMBER AND PERCENT OF CHANGE IN RESTAURANT OWNERSHIP AMONG MEMBERS OF THE NON-PARTICIPATING GROUPS.

No. of changes	Group B (nonparticipating)		Group A (participating)	
	Number	Per cent	Number	Per cent
7	1	1.67		
6	0	0.00		
5	2	3.33		
4	1	1.67		
3	2	3.33		
2	8	13.33		
1	12	20.00	6	9.38
0	34	56.67	58	90.62
Totals	60	100.00	64	100.00

credit is awarded, this would seem to indicate a high level of acceptance and sustained interest.

SUMMARY AND CONCLUSIONS

From the above study, it may be concluded that a continuing program of systematic instruction in principles of sanitation for food service industry contributes to a significant up-grading in terms of compliance with state and city Food Service Codes and Ordinances.

Although both participating and nonparticipating restaurants showed improvement of sanitation as described by inspectors' reports of violations, greater improvement was made by those that participated in the class program. The improvement was sustained, after participation, throughout the study period (1952-1960). Those firms that participated in the educational program had a better record on continuity of ownership than did the nonparticipants. The number of students completing the 16 clock-hour course, compared with the number originally enrolled, would seem to indicate that the content of the course, as well as the methods of presentation, hold a sustained interest for the enrollees.

TABLE 2. SUMMARY OF THE RELEVANT STATISTICS ON CLASS ENROLLMENT

Number of classes in Peoria, 1953-1960	11
Total number of persons enrolled	334
Average class enrollment	30
Enrolled, but did not begin the class	15 — 4.5%
Enrolled and started the class	319 — 95.5%
Started class but did not finish	27 — 8.5%
Started class and finished	292 — 91.5%

ACKNOWLEDGMENTS

We wish to express our appreciation to Dr. Fred Long, Director, Mr. Louis Pickles, Chief Sanitary Engineer, and the inspection staff of the City of Peoria Health Department for their kindness in making available their records for our study, and to the inspectors and the secretarial personnel for assistance in drawing data from the report records.

## PROBLEMS IN AIRPORT SANITATION<sup>1</sup>

MARTIN C. DONOVAN

*Dade County Department of Public Health,*

*Miami, Florida*

In discussing airport sanitation, we will discuss a public health program that is believed, based on its comprehensive nature, to have had its inception in Dade County, Florida, in the latter part of 1957. At this time, the sanitarian assigned to off base catering point inspections, was charged with the responsibility of examining construction plans for the new Miami International Airport Terminal, to see if food services and airline servicing areas complied with Federal and State regulations. The sanitarian continued to perform in this capacity until completion of the construction.

In 1958, the new Miami International Airport Terminal was completed and opened to traffic, and because of the magnitude of the facilities made available to the airlines and their passengers, the Dade County Health Officer assigned the same Sanitarian, for full time duty, to the \$26,000,000 plus facility. Using the magnitude of the operation as justification for a full time Sanitarian, it would be well to support the statement with a few statistics, so that as we proceed with the discussion, we can place in proper perspective, the problems to be coped with in this type sanitation program.

The statistics from the 1961 Dade County Port Authority Annual Report reveal the Miami International Airport complex to cover an area of 2,878 acres, with the terminal alone occupying 80 of the acres. Its value at cost is \$100,546,835. It carries 10% of all air traffic in the nation. In 1961 total flight movements numbered 303,571. It ranked first in the international cargo field with 133,355,028 pounds, or a combined total of international and domestic cargo of 193,263,014 pounds. The number of passengers that passed through the terminal was 4,115,616. Since it is a terminating point, routing of in-transit passengers to other cities does not add to the traffic figure (4).

Operating out of Miami International Airport are 11 scheduled domestic air carriers, 20 scheduled foreign air carriers, 45 irregular air carriers, and 23 irregular air taxis.

There are 90 tenants on the airport and 33 terminal shops, plus 4 car rental firms, and a 270 room hotel, said to be the only one of comparable size in the world, located within the terminal area of a major airport. During peak seasons there are between 25,000 and 30,000 tenant employees on the field. Nearby are some 220 aviation related firms employing 28,000 workers.

Food and drink facilities on the field and in the terminal include 9 industrial cafeterias, 3 snack bars, 4 dining rooms, 5 cocktail lounges, 3 airline VIP cocktail lounges, 2 drug fountains, 3 banquet rooms, 225 food and drink vending machines, and 3 flight kitchens. Five other flight kitchens are located off field, nearby.

The above statistics, among many others not pertinent to this discussion, have resulted in Miami International Airport being known as "Aviation City" to the aircraft industry.

Keeping in mind that airports vary in type, size, and operation, and an airport sanitation program is influenced by location and climatic conditions among other factors, the following areas of sanitation have been incorporated in the Miami International program. These areas of Sanitation are: (a) catering point sanitation, (b) airline servicing areas, (c) aircraft sanitation, (d) industrial waste disposal, (e) industrial hygiene, (f) insect and rodent control, (g) terminal sanitation.

The administration of the program requires the application of four codes. They are: (a) "The Handbook of Sanitation for Airlines" (PHS publication No. 308) which notes provisions of Public Health Law 410 for the prevention and spread of communicable disease from foreign countries into the states or possessions, or in interstate commerce; (b) the "Florida State Sanitary Code"; (c) the "South Florida Building Code"; and (d) the "Dade County Port Authority Rules and Regulations."

It should be understood that the problems arising from the Miami operation are the basis for this discussion. It is not intended to infer they are unique to the Miami Airport and neither are they fully representative of sanitation problems at any given airport.

<sup>1</sup>Presented at the 49th Annual Meeting of the INTERNATIONAL ASSOCIATION OF MILK AND FOOD SANITARIANS, INC. at Philadelphia, Pennsylvania, October 24-27, 1962.

## CATERING POINT SANITATION

Catering point sanitation for the purpose of this discussion is control over flight kitchen operations in the preparation of airline food and beverage service, and its transportation to the aircraft. Problem wise, this type of food service is influenced by climatic conditions. Contrary to weather bureau temperature readings that may appeal to the South Florida tourist, Miami's sub-tropical weather results in temperature readings of 90°F to 120°F on the ramps, in catering trucks, and in flight kitchen areas, the better part of the year.

With these unusual temperature factors and on the premise that very few aircraft operating out of Miami International Airport have mechanical refrigeration, it is indicated that in order to comply with U. S. Public Health Service temperature holding requirements for readily perishable and perishable food and drink, aircraft food and drink be prepared no farther in advance for delivery to the aircraft, than there are temperature holding equipment facilities available, in the flight kitchen.

The arrival of the jet age with the resulting reduced flying time, has been most beneficial in shortening the time food is off temperature aboard the aircraft. In interstate travel, it is rare for food not to be in the process of being served an hour after take-off, from the boarding station.

Flight tray carriers accommodating airline meals have little or no insulation qualities. The carriers are dry iced, but the cooling effect is none other than to delay the rise in temperature of the food in the carrier case. Thus it can be seen this type of food service as it applies to canapes, hors d'oeuvres, sandwiches, salads, seafood cocktails, creamers, certain desserts, etc., requires, in its preparation the starting with well chilled ingredients, and particularly in sandwich preparation, with well chilled bread, which has insulating qualities for the filler.

Under the above stated conditions and during peak seasonal operations, it follows that the flight kitchen will require more refrigeration facilities than the ordinary food establishment. The preparation of hot casseroles for aircraft service entails the use of portable aircraft ovens. This in turn requires the use of oven holding racks in the flight kitchen. Portable aircraft ovens are not equipped with thermometers. The distinct possibility of a defective oven or a defective oven rack unit, requires constant inspection to avoid what could be incubation temperatures in the food being held.

Another problem not common in an ordinary food establishment, but almost a daily occurrence in the flight kitchen, is hardened food soil on multiuse eating and drinking utensils. It is more common on

foreign carriers and results from prolonged storage of the utensils on the aircraft after meal service, and before their arrival in the flight kitchen. This necessitates the use of soak sinks to soften the soil prior to the dishmachine run.

Because of their unique design and construction, the cleaning and sanitizing of aircraft eating and drinking utensils poses a problem, and requires special equipment to accomplish both the cleaning and sanitizing operation. Complicating the matter is the airline company practice to individualize their food and beverage service, as well as the utensils used in its service. In addition, galley construction will vary from aircraft to aircraft and galley equipment is usually not inter-changeable. This for example, because of a last minute change in aircraft for various reasons, could result in the caterer having to repack as many as 178 meals.

In flight kitchens, the requirement of a minimum of food handling in preparation has no meaning. The unique construction of multi-use eating and drinking utensils, and airline specifications as to how food must be arranged on service dishes, requires unlimited finger contact in the packing. The problem here is effecting rigid control over the packer, to prohibit the engaging in any other activity that could adversely affect the food being packed, and in using the flight kitchen hand washing facility, after returning from toilet rooms or lounges.

Equipment and utensil storage is a problem in flight kitchens that service more than one airline. Single service product storage is extensive and galley equipment storage can be out of expected proportion, if foreign carriers are involved. This is due to their practice of constant feeding from take-off to landing and their international cuisine.

Flight kitchens serving in-coming international carriers at Miami International Airport, are required by federal Department of Agriculture regulations, to dispose of food removed from the aircraft, by grinding operations on the premise, with final disposal to the sanitary sewer. This food constitutes prohibited agriculture waste. The City of Miami incinerator is not acceptable to the FDA because the incineration process involves the use of holding bins prior to actual burning. Regarding the removal of the prohibited waste from the aircraft, control over food scavenger operations by aircraft cleaning personnel presents an additional problem. Consumption of the food by the workers has on several occasions resulted in illness which, based on symptoms, indicated gastro-enteric disturbances.

Constant use of load-in and load-out doors in flight kitchen operations present fly and other insect problems from day to day the year round. Protection for these openings into the kitchen involves

the use of air blast curtains, so constructed as to produce a minimum velocity of 1500 linear feet per minute at the critical or floor area. Approved construction and operation is in addition to the velocity requirement at the floor, dependent on no appreciable wave in the curtain, from the discharge nozzle to the floor area, for the width of the opening being protected. It is important that the blower installation be on the outside of the door, so as not to generate food odors in the discharge process that would attract flies or other insects.

#### AIRCRAFT SERVICING AREA SANITATION

Aircraft servicing area sanitation can be defined for our discussion as: (a) control of drinking water, (b) handling and disposal of aircraft toilet water, and (c) handling and disposal of aircraft refuse. Servicing area problems are many fold. Since they involve the boarding of potable water and the removal of toilet waste, this area of sanitation can result in a dilemma to the sanitarian. Control over drinking water involves the piping system, hydrants, water hose, water trucks and carts, as well as their appurtenances, and the transferral of the water to the aircraft.

Problem wise, cross connections resulting in contamination of the municipal water supply can result from non-permitted uses of the drinking water hydrants. The prohibited uses would include the filling of the rinse compartment on soil trucks. The filling of water tanks on scrubmobiles, servicing an aircraft waste connection with a drinking water hose, by employing the use of a nozzle adapter, and by using a drinking water hose to clean certain other aircraft servicing equipment.

Contamination of the aircraft water supply can result from cracked or checked hoses, hose nozzles not protected in transit or in storage, the possible use of nozzle adapters to permit drinking water truck hose connections to aircraft waste connections, towing the soil cart in conjunction with the drinking water cart, and by personnel who are engaged in the handling and removal of aircraft toilet waste being permitted to engage in drinking water servicing operations or to be in contact with the galley or galley equipment.

In the handling and disposal of aircraft toilet waste, three types of toilets are involved, each presenting its own problem. Two of these three type toilets are known in principle as chemical toilets. One a fixed system, and the other involving the use of a portable soil bucket which must be removed from the aircraft for emptying, cleaning, and re-servicing. The fixed system is serviced by the soil truck or soil cart, through the use of a flexible sleeve,

from the soil cart sewage compartment to the aircraft waste discharge chute. The third type toilet is a Wickland flush toilet, and is in use on all pure jets. It is 55 gallons in liquid capacity with one tank forward, and one aft. It is designed to grind and filter waste received from the commodes. The effluent is recirculated for flushing under pressure. It employs the use of a flipper in the neck of the commodes which depresses when the toilet is flushed. This toilet is also serviced by use of the soil truck or soil cart, by a direct connection of the soil vehicle flexible sleeve, to the aircraft waste discharge chute.

The servicing of any type aircraft toilet can and does result in contamination of the ramp by spillage.

In servicing the portable soil bucket, aircraft or ramp contamination can result from spillage by careless handling, failure to cover the bucket after removal and during transportation to the sewage disposal area.

In servicing the fixed chemical toilet, spillage will occur from a defective discharge valve on the aircraft, a leaky soil truck flexible sleeve, or a defective soil truck discharge valve. In some instances, soil truck operators, in emptying and cleaning out the vehicle, forget to close the discharge valve and are not aware of it until they service the first aircraft.

In servicing the Wickland flush toilet, spillage could occur under the same conditions as those mentioned in connection with the fixed chemical system, with the exception that this type toilet employs the use of a wye-plug in the discharge chute which must be locked in place by the use of an instrument in the wye adapter coupling.

Poor cleaning maintenance and storage of soil truck discharge sleeves, as well as poor cleaning maintenance of soil truck discharge valves, both result in fly and odor problems.

In the handling of aircraft refuse, direct disposal from galley waste receptacles to ground storage receptacles is most desirable. Transfer on the aircraft results in spillage of liquids on the galley floor, and contributes to littering the ramps. Air sickness bags should be disposed of by incineration or in triturator rooms.

Galley waste receptacles should be cleaned thoroughly after emptying. They present a problem in the respect they contain much liquid wastes and become highly odorous. Many aircraft servicing areas do not have approved facilities for this type of cleaning. This may result in the receptacles being washed out at aircraft drinking water hydrants, and the resulting waste dumped on the ramp, or in the refuse storage containers. The receptacles may even be washed after emptying in the sewage dis-

posal area which is worse than no washing and being returned to the galley dirty.

As a safety factor in ramp areas accommodating jet aircraft, type and location of garbage and/or refuse storage containers must be taken into consideration. This is essential because blasts from jet taxi operations have resulted in 55-gallon refuse drums being blown into plate glass and in cubic yard roll-a-way storage containers being rolled into other equipment or other aircraft, all resulting in extensive damage. Finally, all garbage and refuse storage containers must be fly tight and leakproof, and under no circumstances should open trash vehicles be permitted in aircraft servicing areas.

#### AIRCRAFT SANITATION

Problems in aircraft sanitation on a local level are limited to galley cleaning maintenance, toilet room cleaning, vermin infestation and routine water bacteriologic sampling of aircraft fixed drinking water systems, and caterer's constant temperature canisters. Of the above named aircraft sanitation functions, the most troublesome is control of roaches. Here, we mention again, Dade County's sub-tropical weather and the numerous foreign aircraft arrivals which combine to magnify the problem. It is further aggravated, because aircraft construction is conducive to harboring and breeding, and poor galley cleaning maintenance supplies the balance of a roach's needs for a comfortable existence.

Many airlines perform their own extermination services during routine hangar servicing checks. Other airlines employ the services of a professional exterminator only when the situation gets out of hand. One airline in particular, a major domestic carrier, employs a professional exterminating company on a contract basis throughout their entire system, and the airplanes are routinely exterminated while on the ramp.

#### INDUSTRIAL HYGIENE SANITATION

Industrial hygiene sanitation has a prominent place in the Miami International sanitation program, because of the many aircraft companies with overhaul bases on the airport, and the many major engine overhaul companies operating on the field. The approach to the resulting problems are educational in nature, as the difficulties that arise are not as much from a lack of safe equipment, safety programs, or protective devices for the worker, as they are the failure of the worker to exercise the necessary care in the safe operation of the equipment and the use of needed protective devices for the job being done. A few specific hazards are as follows:

1. Ear damage from jet and piston operations on

the ramp in servicing, starting, and taxi operations. The same noise hazard in jet and piston engine test cells.

2. Inhalation of paint booth fumes, particularly zinc chromates which are more hazardous than others.

3. Inhalation of fumes from chrome in plating operations, and acid burns.

4. Inhalation or skin absorption of perchlorethylene or trichlorethylene, used in degreasing operations with possible liver damage resulting.

5. Fiberglass handling resulting in dermatitis.

6. Inhalation of fiberglass solvents such as styrene, acetone, methylethylketone, and of fiberglass dust in grinding operations for finishing.

7. Lead poisoning from tetraethyl lead in high octane gas from the cleaning of wing tanks.

8. Eye damage in drip stick operations for removing fuel from wing tanks for specific gravity tests and water determinations in fuel. Eye burns from testing to locate leaks of the hydraulic systems of the aircraft cargo area.

Because of the high concentration of jet take-off and landings at Miami International Airport, augmented by jet transitional flights, and with even more to come as airlines strive for complete jet operation, the Dade County Health Department, through the State Board of Health, requested the U. S. Public Health Service to conduct a noise survey of the Miami International complex. In June of 1962, such a study was conducted by the Research and Technical Services Branch, Division of Occupational Health, Public Health Service, Cincinnati, Ohio (1). Their recommendations to eliminate possible health hazards resulting from noise conditions, incidental to the airport operation, are under study at this time by the Port Authority and airline companies concerned.

#### INDUSTRIAL WASTE DISPOSAL

Industrial waste disposal from airline operations and related airline industries on the airport is at this time the most pressing problem. It has resulted in stream and river pollution and through possible ground water contamination, poses a threat to the Municipal water supply.

The airport has open drainage channels that carry storm water to the Miami River and its tributaries. The drainage channels are grossly polluted by mixed airplane maintenance industrial waste. Without attempting to place responsibility for the present condition, several factors have resulted in the situation getting out of hand. The rapid growth of the airport is a prime factor.

The polluting wastes are quite variable, but the

two principally offensive components are (a) oils and greases, both free and emulsified, and (b) phenolic compounds, principally cresylic acid and its chemical relatives. Existing facilities, hopefully provided in the past for interception of oily waste from overhaul and wash areas, are inadequate.

Major sources of oil pollution are shop waste drains in overhaul and maintenance hangars, and various terminal ramp areas and aircraft washing pads. Oily waste water from maintenance and wash areas have been found to contain free oils, oily sludges, dead paint, various acids and alkalis, phenolic compounds (mostly cresylic acid), various hydrocarbons, and other organic solvents, such as kerosene, mineral spirits, occasional ketones, terpenes, wetting agents and emulsifiers (2). Correction of this problem has been under study by various engineering firms for the past two years. These studies have resulted in recommendations that pre-treatment of this waste be given at the various sources and consist essentially of sedimentation-flotation systems, (to remove hydrocarbon solvents and greases) and cyanide destruction systems. Treatment for chrome and other metal salts would result in some reduction of these contaminants as an incidental benefit from the limited treatment proposed. Such wastes could then be received into the Miami Sewage treatment system (3).

The Dade County Port Authority has budgeted \$500,000 for the off-site treatment. It will require installing of 15,000 feet of line from the present Port Authority trickling filter plant at the airport, to the Miami interceptor system. Several stream and railroad crossings will be required and there will be a sub-aqueous crossing under the Miami River. At the present time, opposition to pre-treatment at the source on the basis of cost, by the offending industrial establishments, may result in litigation and retard Port Authority progress in bringing this problem to a satisfactory conclusion.

#### INSECT AND RODENT CONTROL

Insect and Rodent Control at Miami International Airport involves the cooperation of the Dade County Department of Health and several federal governmental agencies, who have the sole responsibility to prevent the aircraft dissemination of disease vectors and pests of medical or agricultural importance. These agencies are the Quarantine Division of the U. S. Public Health Service, the Animal Inspection and Quarantine Division of the U. S. Department of Agriculture and their Plant Quarantine Division. At airports where the hazard of introducing disease carrying insects exists, such as Miami International, it is the policy of the United States Public Health

Service to conduct "entomological surveillance" of the airport area. This surveillance consists of periodic entomological surveys carried on by entomologists or trained representatives for the purpose of early detection and prompt eradication of any insect which unknowingly may have been introduced by aircraft (5).

Since foreign quarantine regulations define an airport area for eradication of mosquitoes, as in addition to the perimeter of the airport, an area of 400 meters around that perimeter, cooperation with the Public Health Service by the Dade County Health Department in elimination of breeding areas, has been most beneficial because rigid local mosquito breeding laws can be more quickly placed into effect.

The operation of the Port Authority Animal Quarantine Station is under the direction of a Federal Department of Agriculture Veterinarian, and here again, cooperation by the airport sanitarian results in sanitary control over disposal of animal wastes, and of flies and rodents. A permanent rodent baiting station is set up in this area, and is serviced by the rodent control section of the local health department.

Cooperation with the Plant Quarantine Division of the Federal Department of Agriculture, by the airport sanitarian has been demonstrated earlier in this discussion in the reference to prohibited agriculture waste.

Rodent control in the terminal and on tenant property is done by professional exterminating companies.

#### TERMINAL SANITATION

The terminal sanitation phase of the program exercises sanitary control over the public areas of the terminal, such as the rest rooms, the concourses, the loading piers, the hotel, the taxi-cab pool, public and employee parking lots, retail establishments including all food and drink establishments in the terminal and on the field, and the 225 food and drink vending devices on the airport.

Most of the eating establishments operate around the clock. Problem wise, they present little more difficulty than that encountered in any other eating establishment. An exception or two would be some operational deficiencies resulting from the tremendous turnover of this type of worker and their lack of stability. Another would involve peak seasonal operations whereby patronage of the food and drink establishments is so heavy that it is difficult to find a time when the least amount of food is exposed in order to carry out heavy duty floor cleaning maintenance.

Rest rooms require constant cleaning and plumbing maintenance. The use of rest rooms by international passengers, strange to American customs in the use of such facilities, results in many sanitary nuisances. Rest rooms in addition to their intended purpose are used for taking sponge baths, as beauty parlors, barber shops, shoe shine parlors, repair shops, clothes alterations and card rooms. Anything not welded to the floor, wall or ceiling may be stolen. The use of single service paper towels, while highly desirable, had to be discontinued shortly after the terminal opening. They were used as commode seat covers, discarded on the floor or in commodes, and carried off the premises by either design or necessity. Now and then, even roller towels are cut and the pieces used for wash cloths, handkerchiefs and shoe shine cloths.

Littering of the terminal floor area in concourse and loading piers has been solved by continued maid and porter cleaning patrols. Maids service trash and cigarette urns and porters do floor trash pick-up, with parlor brooms and long handled dust pans. They are trained to annoy the litterbug and make him uncomfortable. If a person reading a paper, for instance, is observed dropping cigarette ashes on the floor, the porter will move in and sweep up. This has had the tendency to make people think twice before they litter a clean floor and has saved the Port Authority thousands of dollars in heavy duty floor maintenance. It might be mentioned here that the terminal cleaning contractor has the responsibility of floor cleaning maintenance to the tune of 4,547,671 square feet, which includes the public parking lot.

Dogs present a problem in the soiling of floor areas, and while Port Authority regulations prohibit them in the terminal, Terminal Supervisors have a difficult time distinguishing between the tourist dog and the local vagrant.

Vending machines on the field and in the terminal dispense hot and cold meals, hot and cold sandwiches, hot and cold beverages, pastries, ice cream, milk and mixed drinks, candies and nuts. They present no real sanitation problem. Dates of cleaning maintenance are posted on cards inside of the machine. Servicing of the machines is done by three shifts on a 24-hour basis.

Vending transportation vehicles have refrigeration and heating units, and similar temperature holding equipment is in use in storage facilities at the terminal. Refunds are made at a central location in the terminal without question. This policy is not abused and prevents vandalism of the machines by irate customers who might have otherwise lost their money because of a malfunction of the vending device. Anytime a machine is reported out of order, a vend-

ing machine serviceman is summoned through the public address system.

Time does not permit a thorough airing of all of the problems encountered in an airport program. Neither will time permit relating all the accomplishments that result from such a program. The great satisfaction a sanitarian experiences from his endeavors in this field can be attributed to the fact that in working with the airline industry, he is working with an industry second to none in meeting maximum sanitation standards. We know of no other industry that expends more of its time and money, and on its own initiative, provides better ways and means to insure the health, safety, and welfare of the traveling public.

There are tremendous opportunities for sanitarians in airport sanitation programs. Inspection in the field by U. S. Public Health personnel is nominal. The nation wide scope of such a program on their part is prevented by lack of personnel and sufficient financial appropriations. Sanitary observations at some airports would leave you wondering who is in charge. However, without public health service cooperation through your regional office, such a program will never leave the ground.

The legal authority for conducting that area of an airport sanitation program dealing with interstate and foreign quarantine regulations, as they apply to catering points and airline servicing areas, is vested in the Surgeon General of the United States Public Health Service. He, in turn, delegates this authority to representatives of the State Health Departments, and depends on their recommendations in determining the acceptability of a given catering point or servicing area.

If you plan conducting an airport sanitation program, keep in mind that the airline industry, business wise, are tough people to deal with. It is important that you sell yourself first. If you can prove to them that you know what you are talking about, earn their confidence, express a genuine interest in their problems, prove that you have a better or more economical solution to their problems, and if in addition to being accepted in an administrative capacity, you find you are in demand as a consultant, you will then have a sense of pride in being associated with the most progressive industry in the nation.

We are in the Jet Age. Travel wise, that means newer planes, more speed, and more people. In the administration of any public health program, accomplishments can be measured by the number of people you have helped. If your locality has the possibility of supporting an Airport Sanitation program, and you are not active in this area of sanitation, investigation could be enlightening as to the number of people you are neglecting.



Whatever degree of success the Miami International Sanitation program has attained, can be attributed to the cooperation the Dade County Health Department has received from industry in general, the Dade County Port Authority, the Region IV Office of the U. S. Public Health Service, the Airline Transport Association, and to the excellent working relationship existing between the County and State Health Officers.

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## NATIONAL SURVEY OF SANITARIANS

### A PRELIMINARY REPORT<sup>1 2</sup>

ISRAEL LIGHT AND FRANK A. BUTRICO

*Office of Resource Development, Public Health Service,*

*U. S. Department of Health, Education, and Welfare*

*Washington, D. C.*

We are very grateful for this opportunity to share with you some initial data and critical observations from the first national survey of sanitarians. This project was undertaken by the U. S. Public Health Service with the initial cooperation of the three national sanitarian societies.

Please remember that at this time we are doing little more than opening the door and peeking into the pile of data and series of tables, all of which will be published within a reasonable time as a formal document by the Public Health Service. This will be issued with a maximum of explanation and a minimum of interpretation for the very good reason that the results and implications of the data will mean one thing to the sanitarian, may mean something else to the employer of sanitarians, and could mean still something else to the educator of sanitarians.

We wish to pay open and full respects to the presidents and executive secretaries of the three national sanitarian societies who were with us from the beginning and who rendered every possible assistance to the successful conduct of this project. We

personally and the Public Health Service professionally are indebted to them for their complete support. We feel ethically bound to report the names of the three key people—"Red" Thomasson of your own group, Nick Pohlit of the National Association of Sanitarians, and Hardy Watson of the National Association of Professional Sanitarians.

To begin with, you all know that no definition of a sanitarian was applied in this project. Anyone who claimed himself or herself to be one was welcome to be included, if the survey form was filled out and returned. Well, then, how did we locate you? Our office started off with national sanitarian society membership lists. Then we wrote to State, county, and local departments of health. Then we added State departments of agriculture. An original list of more than 20,000 names was shaken down to approximately 16,000. A number of you were not shaken down sufficiently, and so you received two or even three forms.

I will digress for a moment at this point long enough to give you one example of the headaches involved in a national survey. We began a random spot check of some of the first returned forms. Upon matching some salaries with society membership, we noted that many sanitarians with unfortunately low salaries were apparently watching every penny, yet wished to affiliate with their colleagues, and therefore joined their State group rather than a national group. So we scrambled madly to get

<sup>1</sup>A project undertaken by the Office of Resource Development, Public Health Service, to obtain information relative to the training, utilization, description of activities and compensation of sanitarians in the United States.

<sup>2</sup>Presented at the 49th Annual Meeting of the INTERNATIONAL ASSOCIATION OF MILK AND FOOD SANITARIANS, INC., in Philadelphia, Pa., October 24-27, 1962.

some State sanitarian society membership lists. Still, thousands of forms were already out, were coming back in, and a cut-off date for processing had been established. Frankly, we could not afford the time to unduplicate each new list of names received against the previously developed list.

We wish to emphasize again a basic observation and warning: the following data describe some outstanding characteristics of several thousand persons who *claim* that they are sanitarians. No definition was applied. No respondents were denied inclusion. To this extent we have an inconglomerate mass. If analysis and interpretation of the data result in some even vague but useful profile of the sanitarian, the survey will surely have served a major purpose. At the same time, should certain "head-scratchers" or frankly puzzling relationships arise—and we will introduce a few shortly—then you are to determine collectively if the particular state of affairs correctly identifies and describes bona fide sanitarians or just describes the condition of the group of people who elected to participate in *this* survey and the results must therefore be accepted with caution and reservation.

Now to the actual data. Approximately 16,000 forms were mailed, and about 9,700 were returned, or 60%. Of these, some 8,000 (50% of the total mailed) were usable. Of these 8,000, 7,300 represented sanitarians employed full-time, and so all our data were based on the analyses of returns from these 7,300. The following 10 States, in order named accounted for about one-half of the respondents: California, New York, Florida, Pennsylvania, Ohio, Texas, Wisconsin, Virginia, Washington, and Illinois. Either or both of two reasons account for this concentration. First, the more populous States employ more sanitarians. Second, individuals or groups in these States "beat the drums" more aggressively and thereby "got out the vote" for this survey.

The median age of the respondents was just over 41 years. Remember that this is not an average age. This figure means that half are under 41 and half are 41 or over. But we must confess that about 20% did *not* answer this question. We don't know why. Only 67 of you were women! Perhaps if the other 1,500 respondents had given us their year of birth, the figures might be different. (We are suggesting here still another reason why, if you decide to cooperate with *any* survey, such cooperation should be wholehearted and complete, on the assumption that there is a good reason for every question.)

When it comes to years of experience, the single largest group reported 9 years, or about 20% of the total. But the second largest group—15%—reported 30 or more years of experience. Actually, the two extremes account for about a third of the respondents.

About 20% had less than five years of experience, but then you have the 15% with 30 or more years. It would seem that your field is not recruiting as rapidly as it should. With this kind of evidence, there is the possibility of sanitarians becoming fewer in number in proportion to their need and therefore being made up increasingly of old-timers. Now, age and wisdom should go together. But in terms of the changing physical environment, the infusion of new blood would seem absolutely essential for the best interests of the Nation, the public health movement, and the occupation of sanitarians.

Who do sanitarians work for? Some 80% work for government at some level—local, county, State, or Federal. Another 11% were in business or industry. What titles do sanitarians go by? About 60% have "Sanitarian" as their official title. Another 15% have the title "Inspector," but some 21% have a title other than the four listed in the survey form. In other words, thousands of very fine, hard-working people are lost to the occupation because they are operating under "assumed names." We say this facetiously, of course. But in terms of clear-cut identification with a specific occupation, the desire for professional affiliation, need to lobby for salary equity, and setting of standards for training curricula, something can be claimed for uniformity of identification. It ought to be of concern that 40% do *not* have a position designation clearly and immediately recognizable as being part of a particular occupation.

A next important element is that of primary activity or most important function performed. Though no criteria were set up, we can assume that the intent was to identify the activities which took up the largest part of the work week. A full 50% of all respondents indicated that their primary activity involved inspection-testing-quality control. Another fourth reported management or administration as their most important activity, and an additional 10% reported "general" duties.

When asked to indicate the areas of greatest professional competence, we found the following: milk claimed 33%, food was reported by another 30%, 7% marked "sewage and industrial wastes," and 6% selected "water." This accounts for three-fourths of all respondents. You people in the field will have to determine whether or not this is an accurate report of sanitarian specialization. Not being a sanitarian, our inclination is to attribute such emphasis in part to the fact that your own society membership responded and cooperated handsomely with us in the conduct of the survey.

The pronounced tendency to "stick to one's last" is demonstrated by the fact that, when asked to indicate first and second specialties of greatest pro-

fessional competence, most of the respondents identified related fields. This is perfectly natural. Thus, the largest number of milk specialists selected food as their second choice. The vector specialists identified food as their second category of greatest competence. An so on.

Of course, the other side of this coin suggests that the concentration of such related areas is a form of inbreeding. In view of the great variety of substantive areas in which sanitarians find themselves employed, perhaps something can be said for broader training in terms of the acquisition of modest background in two relatively *unrelated* fields.

We left the area of education and training to last because it raises the most questions, and we wish to leave you more with questions than with figures. Roughly two-thirds of the respondents reported having a college education. How much education is involved? Well, about 40% have only the bachelor's degree. Although the final returns have not all been processed yet, perhaps another 20% have a master's degree, and about 3% have a doctorate. Two-thirds of the bachelor degrees are B.S. About 20% are B.A. Considering the science orientation required for your field, it is our cautious observation that there are still too many B.A.'s who have been given the equivalent of the World War II second lieutenant treatment—90-day wonders, they were called. Half of these B.A.'s were awarded in the 1950's.

Let us face it—sanitarians will not raise their salary levels and achieve universally recognized professional status by giving quickie courses in parasitology and entomology to English and music majors and cranking out would-be sanitarians. I realize the difficult time many of you have in latching on to adequately trained people. We know you do the best you can, and we are really impressed by the intensity of some State training programs in this field. No doubt, this observation or warning comes as no surprise. We simply corroborate what many of you already know.

Incidentally, we also know which institutions are training sanitarians. For example, of the more than 700 schools awarding bachelor degrees to young people who went into sanitarian work, about 71 schools—10%—account for a full half of these graduates.

As expected, there is a corresponding relationship between age and degree. Recall that the median age of the entire group was 41.3 years. That of the bachelor's-degree-only group was 39. It was somewhat higher for holders of the master's degree and the doctorate. The median age of those with no degree was an understandably high 46 years.

What "majors" were taken in college? For the bachelor's degree, the agricultural sciences barely nosed out the biological sciences for priority. But,

again, we must warn that the great concentration of undergraduate major in the dairy field could well reflect the great response from you people in this Society. So far, the sanitary science major has yet to establish itself, because only three percent had a bachelor's degree in this field. It was even exceeded by those who majored in the social sciences and who then found their way into the sanitarian field. However, a considerably larger number have the master's degree in sanitary science. This is obviously a graduate program area.

While the possession or lack of at least a bachelor's degree appeared to have little effect on who the sanitarian worked for (with the exception of colleges and universities, of course), it did make a difference in terms of what the sanitarian did. The State, county, and local governments, in descending order, were the largest employers of both those with as well as without a degree. But three times as many were employed in management or administrative positions (the so-called "higher" positions) if they possessed the degree.

We wish to conclude this brief analysis with a few puzzling observations and some direct questions.

If you will recall, the survey form asked the respondent to indicate any areas of *additional* training he would like to have and would prefer to have, if the opportunity for such presented itself. The replies were divided into two groups, those without a degree and those with a degree of some kind.

The analysis of the no-degree group revealed two outstanding observations. First, the great majority voted in approximately equal numbers for more training in the field of administration-supervision-management and in the area of technical knowledge. The field of program planning and evaluation was a poor also-ran. In view of the fact that 50-55% of respondents indicated themselves as being in the field of inspection-testing-quality control, it is surprising that so few registered a preference for additional training in program planning and evaluation. Or is it surprising? Some combination of the following three reasons surely must account for this aversion: first, there are relatively few such programs of planning, and perhaps even fewer of evaluation; second, methodological tools or techniques of evaluation are still too crude to be effective; and third, most program planning and evaluation are performed at supervisory levels, and most of the respondents are not in this category. However, none of these reasons should remain an excuse much longer. More sanitarians should be participating in programs designed to evaluate levels of achievement in their own field.

As a second major observation, we asked those who preferred additional training in a substantively technical field to specify their particular interest.

Without exception, everyone in the 15 major categories of greatest professional competence which were listed, chose more of same! Thus, those specializing in milk selected milk in greatest number for their area of additional training. Those who specialize in vector control selected vector control in greatest number for their area of additional training. And so on.

Now, the amazing observation we must report is that the pattern of response was identical, whether you had a degree or not! Both groups responded in exactly the same manner. This same response was noted in Question 4 of the survey form, where respondents were asked to identify the short-term, specialized courses they may have taken. Again, the specialist listed more of his own specialty.

This raises some disturbing questions. What has happened to the notion of broad and comprehensive exposure to and training in the field of sanitary science or environmental health science? How can we account for what looks like an unmistakable professional inferiority complex that appears to force you to stay within your own narrow specialty? Why are you reluctant, as a milk or food specialist, for example, to pick up some background in housing or air pollution? Is the sanitarians' formal academic training literally subminimal and inadequate for effective on-the-job performance? Remember, the overwhelming number of degree holders held the B.S. and not the B.A? Are the actual jobs so specialized?

Perhaps the answer to this last question is: "Yes, these separate jobs are specialized, and with newer technological developments more and more time must be devoted to their mastery." Yet this answer does not match my question of what a generalist is and who needs him. We can understand the need for something approaching a Jack-of-all-trades for an overseas assignment, but we are puzzled to account for the domestic picture. If, from the employer's point of view, there is need for a sanitarian generalist, what is the source of this need? Is it the result of his feeling that the occupation's substantive areas

are not too deep and that therefore he can afford to ask for someone comprehensively trained? Or is it the employer's recognition of an actual manpower shortage and therefore sanitarians are being forced into a generalist role and have become Jacks-of-all-trades and master of none, perhaps? Or is this generalist category the result of pressures exerted by sanitarians themselves in their search for professional status by aggressively claiming more and more as being within their bailiwick of job duties? Of course, there is always the possibility that the sanitarian sees little vertical mobility upward in the public health field as a generalist sanitarian and therefore prefers to count on his specialization to take him as far as is possible. We raise these questions without having any preconceived notions, we can assure you. Obviously, as in any occupation, a certain number of generalists are desirable and necessary. The question is how many—enough to be needed or enough to be characteristic of the occupation?

As we stated in our opening comments, our office is pounding down the home stretch in organizing the considerable statistical data which all of you assisted in furnishing us. Most conceivable major relationships you can think of have been anticipated. In looking ahead to what your national and State sanitarian societies might want to know and act upon, we have worked up some special and detailed relationships.

The salary data are representative of what the final U. S. Public Health Service publication will contain. We have matched salary with age, with extent of education, with type of employer, with your most important duties, with your area of special competence, and then we linked up some of these factors with the State in which you work, all to provide a variety of comparisons.

We have already overburdened you with data. Only a few points and questions have been raised. The full report will bring to the surface even more questions and problems. This is good, because only good can come from this first nation-wide survey of sanitarians.

# HYGIENIC ASPECTS OF MILK AND PAYMENT FOR QUALITY<sup>1</sup>

JOSEPH C. OLSON, JR.

*Department of Dairy Industries, University of Minnesota, St. Paul*

Each of the characteristics that denotes quality in milk may be influenced by the hygienic or sanitary practices used in the production, processing and distribution of milk. Furthermore, each bears a relationship to either the presence or growth of microorganisms in milk.

Maintenance of the consumer's high regard for milk is essential. High standards of cleanliness within the industry will minimize the hazard of disease transmission through milk and will enhance its esthetic attractiveness. Milk of high sanitary quality and of unimpaired nutritive value will tend to encourage consumption and thereby be to the best interest of the consumer and to the dairy industry as well.

The availability of high quality milk supplies will depend largely upon the operation of effective sanitary control programs. Essential elements of such programs are (a) standards or requirements which must be satisfied, (b) enforcement, (c) education, and (d) compulsory pasteurization. Likewise, proper knowledge of the sources of microorganisms in milk and their control as well as the effect of other milk handling practices, such as developments in refrigeration and transportation, on milk quality are necessary.

Some distinction may be made between the bacteriological quality of raw milk as an indicator of sanitary practices used in its production, and bacteriological quality as an indicator of the suitability of milk for processing. It is clear, however, that production of milk of high sanitary quality and which is suitable for any use can best be accomplished by the application of good sanitary practices throughout all stages of production and transport to point of processing.

Important in the procurement of quality milk is an incentive on the part of producers to produce such milk. A meaningful standard of quality should be set, compliance with which is indicative of significant accomplishment. Recognition of achievement in some tangible form and large enough to be worthwhile must be provided to those who qualify.

Desire for volume of milk on the part of processor, cooperative or independent, at the expense of quality is certain to be a demoralizing influence on the operation of incentive programs.

Consumers have great confidence in the wholesomeness of milk. In this regard, it enjoys an enviable position among food products. There is good reason for this. In the first place, probably no food

product is subjected to greater surveillance by government regulatory agencies whose primary responsibility is to protect the public health. This has occurred through recognition of the fact that milk improperly handled provides a ready medium for the transmission of disease. In many areas, milk, like water, is almost a universal beverage and is consumed by almost every person in some form almost every day. Furthermore, a great many people may be served by a single supply. Consequently, a contaminated supply may endanger the health of a great many individuals. Milkborne disease epidemics of the past stand as monuments ever reminding of the probable consequence of inadequate sanitary control of milk supplies. The dairy industry and government regulatory agencies recognize joint responsibility in providing safe milk. The many excellent and safe milk supplies available to consumers attest to the manner in which this responsibility is met.

It is widely recognized that of all foods, none is more important to the health of the individual than milk. This is evident from the numerous dietary patterns recommended by various government agencies and nutrition councils. In these dietary patterns, milk is prominent as an item which is recommended for inclusion in the diet of individuals of all ages.

It is extremely important, therefore, that high quality milk supplies readily be available. Anything that might happen to milk which would result in its being less desirable to consume, such as an unfavorable appearance, an objectionable flavor, or a lack of confidence in its public health safety, will tend to discourage consumption. This would not be in the best interest of the public. High standards of cleanliness within the industry will minimize the hazard of disease transmission through milk and will enhance its esthetic attractiveness. Milk of high sanitary quality and of unimpaired nutritive value will tend to encourage consumption and thereby be to the best interests of the consumer and to the dairy industry as well.

## ESSENTIAL ELEMENTS OF EFFECTIVE SANITARY CONTROL OF MILK SUPPLIES

Perhaps at this point it would be well to consider those elements which are essential to effective sanitary milk control. Consideration of these is germane to any discussion dealing with the broader aspects of milk sanitation.

<sup>1</sup>Presented at the North Atlantic Treaty Organization (NATO) Third Summer Course on "Organization and Evaluation of Animal Production in Larger Areas", organized by the International Agricultural Center with the support of the Ministry of Agriculture and Fisheries and the Department of Animal Husbandry of the State Agricultural University, August 27-September 1, 1962 at Wageningen, The Netherlands.

### Standards

The first essential is the establishment of standards—the requirements which must be satisfied in producing, processing and distributing milk. These relate to (a) cows, their care and management; (b) use and construction of physical facilities; (c) milking methods; (d) handling and processing methods, including equipment construction, use and cleanliness; and (e) distribution practices. Standards should be reasonable of attainment and be related to milk quality. Past experience has shown that sanitary standards or regulations often have been used as economic trade barriers to the free movement of high quality milk supplies from one location to another. Thus, such standards, under the guise of serving to protect the public health, have served primarily to maintain exclusive markets for those producers and distributors which are located in close proximity to the city or urban area of consumption. Unnecessary requirements increase costs of production and processing. The net result ultimately is reflected in higher cost of milk to the consumer. A brief glance into the history of regulatory control of milk supplies in the United States provides ample evidence of the occurrence of such practices.

The establishment of milk ordinances in the United States began at about the turn of the century in recognition of the role that milk may play in the spread of disease. Also, it is interesting that one of the major objectives of the early ordinances was to control adulteration of milk by adding water.

The scope of milk regulation by municipalities and state governments expanded rapidly. Many principal features of early ordinances were copied by other municipalities and states, but generally, each new ordinance included special requirements applicable to the particular area involved. This resulted in the creation of a large number of laws and regulations governing the dairy industry and in requirements that differed from one jurisdiction to another. Certain clauses that appeared in ordinances were restrictive; they became effective trade barriers masquerading under the guise of public health safeguards. Thus, numerous standards of quality were established, some of which had little or no relationship to quality and frequently were costly and confusing to the public producers and processors as well.

The situation today, however, is vastly different, largely because of early recognition of the problems which inevitably would be created by overlapping authority and the lack of uniformity in the structure and application of sanitary milk regulations. Particularly significant in this regard was the publication, in 1924, by the U. S. Public Health Service of the first edition of a milk ordinance covering items

of milk sanitation on farms and in processing plants. States and municipalities were urged to adopt this ordinance in the interest of providing a more uniform system of effective milk control. The recognition of this ordinance, now known as the Milk Ordinance and Code (5), has steadily increased and today it has been adopted by many states and municipalities.

More recently a voluntary cooperative State-Federal program for certification of interstate milk shippers (6) was developed. Through this program, uniform administrative practices have led to the development of a high degree of reciprocity between states on acceptance of inspection and laboratory results.

Coupled with the above has been the development of standards for the sanitary design of milk production and processing equipment. These are known as 3-A Sanitary Standards for Dairy Equipment (3), the "3-A" being symbolic of the three organizations that formulate these standards.<sup>2</sup> Wide acceptance by regulation agencies and by industry of equipment bearing the 3-A symbol has been achieved. This has greatly reduced the number of dissimilar design specifications required by regulatory agencies throughout the country.

The most recent effort toward uniformity has been the development of a system of certifying milk laboratories. This is coordinated by the U. S. Public Health Service through the individual state milk sanitation control authorities. Periodic surveys of laboratories and personnel concerned with bacteriological and chemical analyses are made and deviations from standard methods are noted and corrected.

While the above efforts have led to greater uniformity in sanitary milk control regulatory practices, we still have a few areas which recognize no reciprocity; hence, major impediments to interstate and even intrastate milk shipment still exist through the imposition or arbitrary and unrealistic sanitary requirements which cannot be justified on the grounds of providing protection to the public health. There is need elsewhere in this world too, I am sure, for realistic appraisal of requirements which are imposed or may be proposed in the avowed interest of providing a sanitary or hygienic milk supply.

<sup>2</sup>The 3-A Sanitary Standards are formulated by the 3-A Sanitary Standards Committees which consist of the following: (a) The Committee on Sanitary Procedure of the International Association of Milk and Food Sanitarians; (b) The Sanitary Standards Sub-Committee of the Dairy Industry Committee—representing dairy trade associations; and (c) Representation from the Milk and Food Program, Division of Environmental Engineering and Food Protection, Public Health Service, U. S. Department of Health, Education and Welfare.

### Enforcement

The second essential in an effective milk control program is enforcement. Standards are meaningless without their enforcement. This may be accomplished in several ways. Permits or licenses previously granted to producers or processors may be suspended or revoked for non-compliance with standards. Downgrading or revoking the privilege of using a grade label denoting a certain level of quality may be resorted to. This might, in the case of raw milk, place the milk in a lower price category; or, in the case of pasteurized or final consumer products, necessitate a change of label by the processor to that of a lower grade. Consumers react quickly in their refusal to accept milk bearing the label of a lower grade. This creates economic pressure and is an effective enforcement procedure, although it may drastically impair the business of the violator. Prosecution under penalty clauses of statutes or ordinances is another effective means of enforcement which may be used in instances of non-compliance with standards.

A long standing principle of good public health milk control practice is that the bulk of enforcement work should be done at the municipal or local level of government. This is based on the premise that control then will be done by those who have the greatest interest in providing good quality milk to the community and who can provide direct supervision over milk production and processing. It appears that in many areas there is need for reevaluation of this premise. Today milk may be produced within a relatively small geographic area and be processed in a single large processing plant. Its distribution, however, may cover the area of a whole state, province or other major geographic area. Economies borne of large centralized processing have eliminated many small or local milk processing plants. The traversing of jurisdictional boundaries inevitably involves milk control agencies at higher governmental levels (county, state or provincial) than those of villages or cities. For this reason there is need for strengthening such agencies and for eliminating needless overlapping local jurisdictions. The pioneering efforts of cities in the development of sanitary control of milk supplies should be recognized, but steadfast adherence to the principle that municipal or local control is inviolate is not consistent with today's system of milk production, processing and distribution in many areas.

### Education

The third principle of effective milk control is education. Education must be directed at producers, processors and consumers alike. Consumers must be well enough informed so that their demands

are in keeping with what can be supplied. Consumers have the right to expect milk of such quality as can reasonably be attained. The industry should be fully knowledgeable relative to the methods of providing a sanitary and safe product and they should be given the reasons for various requirements imposed upon them.

### Compulsory pasteurization

The fourth principle of effective milk control is compulsory pasteurization. The assumption that raw milk of low bacterial count and from tuberculosis and brucellosis accredited herds is necessarily safe milk cannot be justified. Likewise, reliance on environmental conditions designed to prevent all possible contamination of raw milk with pathogens as a means of providing safe milk is not economically feasible even if possible. Pasteurization plus the application of rigid control over the sanitary handling of milk and pasteurization must be provided if safe milk supplies are to be assured.

### THE MEANING OF QUALITY

The term "quality" in reference to milk has been described or defined in many ways. Perhaps Dahlberg *et al.* (1) have best indicated the attributes or characteristics which denote quality in milk as follows: freedom from disease-producing bacteria and toxic substances; freedom from foreign material; low bacterial count; good flavor; satisfactory keeping quality; and high nutritive value. Obviously the attainment (in the literal sense) of each of these attributes would be somewhat less than complete. Nevertheless, most would agree that every reasonable effort should be made to attain them. It is also evident that each of the above attributes may be influenced, in greater or lesser degree, by the hygienic or sanitary practices used in the production of milk and during its processing and distribution as well. Furthermore, each bears a relationship to either the presence or the growth of microorganisms in milk.

### FACTORS AFFECTING THE BACTERIOLOGICAL QUALITY OF MILK

Since the bacteriological quality of milk is so closely related to the overall quality of milk, the sources of microorganisms in milk and the influence of certain handling practices on bacteriological quality of milk deserve mention at this point.

#### *Sources of microorganisms in milk*

*Interior of the udder.* With rare exception, milk drawn aseptically from a healthy udder will contain bacteria. On exclusion of the first ounce or two of milk drawn, the microflora generally will consist of species of *Micrococcus*, *Streptococcus* and *Coryne-*

*bacterium*. The total number present will be low, usually ranging from 100-1000 per milliliter but occasionally exceeding these limits. The presence of disease in the cow and particularly udder infections, of course, may serve to greatly alter the bacterial flora qualitatively or quantitatively.

The "normal" udder microflora generally is less active in respect to growth or reproduction and metabolic activity than are organisms which subsequently gain access to milk. Furthermore, their activity is markedly retarded as temperature is lowered; their growth practically ceases at 45°F (7°C) or below.

*The exterior of the animal.* The surface of the animal represents an abundant reservoir from which microorganisms may gain access to milk. The surfaces of the udder and teats and the rear quarters of the animal particularly are significant in this regard. Organisms of enteric origin, i.e. enterococci and coliforms; gram negative rods of soil and water origin; sporeformers; and molds are common contaminants from this general source. Psychrophilic species among the gram negative types may be especially significant in areas where rather extensive periods of low temperature storage of raw milk occur. Likewise, certain anaerobic sporeformers important in gassy defects of cheese may be found abundantly in the barn environment where silage is fed. These may find their way to the surface of the udder and teats, into the air or to milking equipment and thence into milk. In some areas this has led to a ban on the feeding of silage to cows whose milk is used in making Swiss and other types of cheese. Thus, the numbers of microorganisms likely to be contributed from the exterior surfaces of the cow may be important quantitatively and qualitatively.

Cleanliness of the animal will reduce the numbers from this source to well below 1000 per milliliter, especially if the animals are housed and milked in a barn or area which is kept free of accumulations of manure and soiled bedding. Contamination from this source may be greatly reduced through machine milking, providing the udder and teat surfaces are effectively cleaned. With hand milking, cleanliness of the udder and flanks is perhaps even more important; also, smalltop milk pails and avoidance of "wet hand" milking are effective control measures.

*The atmosphere or air.* This is the third general source of microorganisms in milk. Brushing or feeding of animals just prior to milking may result in air laden with diverse types of microorganisms. Even under extremely dusty conditions, the total number contributed per milliliter of milk will be only a few (less than 50); however, they are likely to be the more resistant forms such as sporeformers, micro-

cocci and mold spores. These are better able to withstand drying without harm and do predominate in dried material dispersed in the atmosphere.

*Milking equipment.* The most important source of microorganisms in milk is the equipment used for milking and subsequent handling of milk prior to distribution or processing. Milk residues left on milk contact surfaces through failure to adequately clean and sanitize them provide a source of readily available nutrients to support microbial growth. Such equipment, when wet and during storage at moderate temperatures, will permit the development of great numbers of various types. Subsequent use of such equipment may be responsible for the presence of hundreds of thousands of bacteria per milliliter of milk. Thorough cleaning of equipment after each use is the only means for effective control of this most important source. The development and almost universal availability of good cleaning chemicals greatly facilitates the ease of accomplishing this.

*Milk handling personnel.* Personnel involved in the production and handling of milk may contribute to the microflora of milk. Total numbers of microorganisms contributed usually will be small but human pathogens may be among them. Raw milk available for consumption may serve as a vehicle for the transmission of several diseases, especially enteric and respiratory types. Pasteurization provides an effective safeguard; however, in much of the world, raw milk still is consumed in large quantities.

Milk handling personnel are important is another respect. One or more such individuals directly affect the extent to which the other sources of microorganisms in milk are controlled. The level of microbial population in milk will be dependent largely on the extent to which the efforts of personnel will contribute to clean cows in a clean milking environment and to the use of clean milk handling equipment and methods.

In view of the mechanisms available for the control of the above sources, no hardship is attendant to the production of milk with an initial bacterial count of only a few thousand per milliliter as measured by agar plate methods. This is evident by the examination of records of producers in numerous markets. It is not uncommon to find fifty percent of the producers consistently producing milk below 10,000 per milliliter and ninety percent or more below 50,000 per milliliter.

#### *Influence of cooling practices*

If milk must be held for any appreciable time before processing or consumption, refrigeration is the only acceptable means available for controlling the growth of microorganisms therein. For many years, milk production and handling procedures have made



extensive use of mechanical refrigeration. The relatively recent advent and now extensive use of the refrigerated farm bulk milk tank has constituted a major advance in this regard. Their use makes it possible to cool milk rapidly to well below 40°F (4.4°C) immediately after production and to hold it at that temperature as long as desired. Bacterial growth is effectively prevented. Every other day pickup of milk from farms is possible, thus effecting economy of procurement. Stainless steel tanks mounted on trucks which transport milk from farm to plant and from plant to plant are constructed in such manner so as to prevent milk from increasing in temperature more than two or three degrees during a period of 24 hours. Consequently, movement of milk over long distances without impairment of quality is possible and is commonplace in many areas.

Effective refrigeration coupled with the use of equipment of sanitary design and the advances which have been made in materials and methods for cleaning and sanitizing milk handling equipment make possible the production and maintenance of milk of high bacteriological quality with relative ease. However, all is not well in this regard. Producers, and others as well, have become accustomed to measure the sanitary quality of milk largely in terms of standards based upon bacterial counts of milk or the bacterial activity therein. Generally such standards as were established were commensurate or in accordance with what reasonably could be attained. It might be expected that as advances took place in refrigeration, sanitary design of equipment and in cleaning materials and methods, there would be an accompanying lowering of acceptable bacterial count limits. This has occurred but not to the extent that might logically be expected if we are sincere in professing our belief that milk should be produced and handled in a sanitary manner. Unfortunately, effective cooling may mask insanitary practices. Bacteriological standards commonly in effect may be met with little or only sporadic attention being given to good sanitary practices. A simple illustration may be cited. Each year my class in Dairy Microbiology conducts a simple exercise consisting of adding 500 milliliters of sterile water to each of two 10-gallon milk cans, one properly cleaned and the other improperly cleaned but both held at room temperature for 12 hours prior to the addition of the sterile water. Invariably, approximately 100-150 bacterial colonies appear on agar plates prepared from a 10<sup>5</sup> dilution of the rinse water in the improperly cleaned can. Less than 10 appear on plates prepared from a direct plating of 1 milliliter of rinse water from the clean can. Assuming the number of colonies from the unclean can was 100, this would indicate the

presence of 5 billion per can (100x10<sup>5</sup>x500). Assuming the volume of the can to be 40 liters (approximately 10 gallons) and that this amount of milk was added to such a can, the resulting count of the milk would be 125,000 per milliliter (5 billion ÷ 40,000) even if the milk added were sterile! Yet, this milk would be considered to be of acceptable sanitary quality if measured by many existing standards based upon bacterial activity or count limits. Obviously, any bacteriological standard which would not discriminate against milk handling practices exemplified by the above cannot be considered realistic.

#### BACTERIOLOGICAL QUALITY OF RAW MILK IN RELATION TO ITS UTILIZATION

A distinction may be drawn between the bacteriological quality of raw milk as an indicator of sanitary practices used in its production and the bacteriological quality as an indicator of the suitability of milk for processing.

The number of bacteria required to alter raw milk detectably is considerably greater than the number which might indicate insanitary production practices. The early work of Hammer and Hix (3) and others has shown that the growth of pure cultures of various bacteria may reach levels ranging from approximately one or two million to several hundreds of millions per milliliter before any change in milk may be detected by flavor, chemical or physical examinations. Variations are affected by several factors including type of organism, temperature of growth and availability of oxygen. Recent studies in our laboratories (4) using pure cultures of psychrophilic types have shown that even with the most active types, approximately 2 to 10 million per milliliter must develop from an initial population of a few hundred before physical or flavor change may be detected in milk.

It is not uncommon to find bacterial counts considerably in excess of 5 to 20 million per milliliter in raw milk supplies from individual producers without observing any detectable defect. It is difficult, if not impossible, to know whether the presence of such numbers is the result of growth originating from a few bacterial cells or is the result of a massive inoculum from unclean equipment used in handling the milk. In the first instance, it might be expected that if active, defect-producing species grow to a level of a few million, an undesirable change may occur. In the second instance, rapid cooling of milk with high initial populations present would result in such populations remaining dormant; and millions of undesirable organisms may be present without detectable change occurring, provided that low temperature is maintained.

Viewed solely from the standpoint of the probability of deleterious change likely to occur in raw milk, there is little justification for bacterial count limits less than one or two million per milliliter. Even such population levels would seem to provide sufficient safety factor from that standpoint. There are other factors to consider, however. Previous discussion has emphasized the relationship between bacteriological quality and sanitary production practices. Bacterial count limits must be relatively low to be of significance in this regard.

Of major importance also are the types of microorganisms rather than mere numbers that might be present. Excessive numbers of thermodurics, coliforms and certain sporeforming types in raw milk may have significant effects on the quality of final or finished products.

The shelf life or keeping quality of properly refrigerated pasteurized milk (below 45°F or 7°C) is not materially affected by thermoduric bacteria; however, certain of the thermodurics are quite capable of altering milk held above this temperature. Pasteurized milk may not always be kept properly refrigerated, for example, in wholesale or retail outlets and in the home. The importance of excessive numbers of thermoduric bacteria in raw milk supplies thus assumes some importance.

The problems arising from the presence of an excessive number of coliform bacteria in milk used in the manufacture of raw milk cheese, particularly Cheddar cheese, are well known. The common practice in many areas of applying sub-pasteurization heat treatments to cheese milk is done primarily for the purpose of reducing the coliform population to tolerable levels, thus minimizing the occurrence of gassy defects as well as flavor defects caused by other bacterial types of similar heat resistance.

The method of manufacture of much of the volume of nonfat milk solids is dependent upon the manner of ultimate use of this product. For example, nonfat milk solids containing excessive numbers of sporeformers is discriminated against by purchasers of this product for use in preparation of baby foods and other canned and sterilized products. With excessive numbers present in raw milk, normal heat processing treatments given to such products may not be sufficient to attain sterility. Consequently, excessive numbers in raw milk supplies may contribute significantly to spoilage of the finished product. Furthermore, excessive numbers of sporeformers may be traced to their "build-up" during long periods of plant operation. Likewise, certain sporeformers important in the "bitty" defect of pasteurized or "sterilized" milk are more likely to be troublesome if raw milk supplies contain large numbers of them. Also, as was mentioned previously,

certain silage anaerobes if present in excessive number may cause serious gassy and flavor defects of Swiss type cheese.

More recently the presence of excessive numbers of staphylococci in cheese milk has received attention as a result of several extensive outbreaks of food poisoning traced to cheese. Studies have shown that mild heat treatments sufficient to reduce the staphylococcal population to a few per milliliter or less will result in little or no danger of their increasing to significant number during cheese making. Just what minimum level in milk for *raw milk cheese* is necessary to avoid possible build-up to hazardous levels is not clear.

It seems evident, therefore, that some distinction must be made between the bacteriological quality of raw milk as an indicator of sanitary practices used in its production, and bacteriological quality as an indicator of the suitability of milk for processing. The sharpness of this distinction, however, is clouded on the one hand by the relative importance of various sources of microorganisms in contributing certain undesirable specific types as well as gross numbers; and on the other hand by the effectiveness of modern cooling facilities in masking insanitary production and handling practices. It is clear, however, that the production of milk of high sanitary quality suitable for any use can best be accomplished by the application of good sanitary practices throughout all stages of production and transport to point of processing.

#### INCENTIVE FOR QUALITY

Perhaps one of the most important adjuncts to the procurement of quality milk is providing producers with an incentive to produce such milk. Where this has been done, the response has been dramatic. It is human nature to strive for a goal which promises a reward on its attainment. Incentive programs must be carefully organized. First consideration should be given to the establishment of a meaningful standard, compliance with which is indicative of significant accomplishment. Next, consideration should be given to what form of recognition should be given to those who qualify. Several possibilities may be suggested. Perhaps the most common form is the payment of an additional amount of money per unit weight of milk for meeting the standards imposed.

What should be the amount of the incentive payment? It must be large enough to be worthwhile of achievement. Generally, such payments range from 2.5 to 10 per cent of the average price per weight or volume of milk delivered. In the case of cooperative producer associations, a fixed amount of money

is available for distribution to member producers after necessary expenses have been deducted from gross receipts. Suppose this amounts to an average of \$4.00 per hundredweight of milk for each producer. Using a differential of 5% the incentive payment would be 20 cents per hundredweight. If 50% of the producers involved qualified and 50% did not qualify, one-half of them would receive \$4.10 per hundred and the other half \$3.90 per hundred. For a producer whose production averages 200 gallons per day (approximately 1700 pounds) his return would be \$3.40 per day in excess of that available to him if he did not qualify. In a month's time this would amount to approximately \$100. There are few producers who would ignore the opportunity to increase their return by this amount or an amount of the same relative magnitude under a different price structure.

The question of what is meant by a meaningful standard arises. This will be dependent upon the general quality level which producers are capable of attaining. Obviously the amount of educational assistance which has been provided, the type of facilities possessed by producers, and their level of understanding of sanitary production methods will determine in large measure the standard to be imposed. For example, in one well developed area where milk is produced primarily for fluid consumption, a bacterial count standard of 50,000 per milliliter was established by the largest producer cooperative (approximately 2500 producers) supplying this market. The regulatory standard in existence was 200,000 per milliliter. Thus, the standard for incentive payment was set well below that required by the municipal regulatory agency. All producers recently had acquired refrigerated farm bulk tanks. The situation attendant to rapid and effective cooling facilities, whereby insanitary practices may be masked, developed. This was a major factor which led to the implementation of the incentive payment program. It was decided that a standard be set which initially would permit approximately 60% of the producers to qualify for the incentive payment. This would leave sufficient room for improvement. Examination of past records permitted the prediction that a standard of 50,000 per milliliter would suffice. The first month, 62% of the producers qualified! The program has been in effect two years. During the past year this percentage has generally ranged between 85 and 90%, occasionally exceeding the latter. The improvement achieved by the introduction of this plan is self-evident.

The success of incentive payment plans is dependent in large measure upon uniformity of application. Situations whereby quality of milk produced becomes secondary in importance to volume

obtained can be demoralizing to incentive payment plans. If the desire of a processor, cooperative or independent, to increase the volume of milk available for processing is so great that quality factors are largely ignored in the price structure, there is little incentive other than personal pride for a producer to put forth the effort to produce milk of high sanitary quality. Consequently, if the marketing structure permits, certain producers will shift from one plant to another depending upon which is more lenient in grading his product. The number of such producers that may be lost to a plant for this reason may be sufficiently large to seriously affect the volume of milk processed and thereby the economy of operation. Under such conditions, quality improvement programs and incentive payment systems, if they existed at all, soon disappear or degenerate to one supported only by lip service.

In conclusion, it should be emphasized that the availability of ample supplies of wholesome milk is essential to the best interests of the consumer and the dairy industry as well. The dietary importance of milk is such that consumption should be encouraged. Necessary precautions must be taken, however, to prevent milk from becoming a vehicle in the transmission of disease. Bacteriological quality, which is so closely related to the over-all quality of milk, must be maintained at a high level for reasons of public health protection and to prevent flavor, chemical or physical deterioration through microbial activity. This can best be achieved by surrounding the production, processing and distribution of milk with influences which encourage the application of sanitary practices.

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## Forty-Ninth Annual Meeting

OCTOBER 24-27, 1962, BENJAMIN  
FRANKLIN HOTEL, PHILADELPHIA, PA.

International Association of Milk and Food Sanitarians, Inc.

### Pennsylvania Affiliate Hosts Excellent Annual Meeting

"These are challenging days for the health professions — the responsibilities are great, but the rewards are even greater." This was the statement of Dr. Leroy E. Burney, vice-president of Health Sciences, Temple University, Philadelphia, Pennsylvania, as he keynoted the opening of the 49th Annual Meeting of the IAMFS last month in Philadelphia.

Dr. Burney, former Surgeon General of the United States Public Health Service, emphasized that changes affecting the health professions are closely related to increasing population, urbanization, industrialization, age, character and mobility of the population. In the face of ever increasing complexities, he pointed out that society does adapt continuously to change. Such adaption, however, can only occur through advances in research and technology in all the health sciences according to Dr. Burney.

A total attendance at the meeting this year of slightly over 300 was less than expected, especially in view of the rather high concentration of sanitarians in the middle and northeastern areas; although, 36 states, Canada and Australia were represented. On the other hand, attendance at the various sessions was exceptionally good. As was the case in Des Moines last year, the meeting rooms at the Ben Franklin Hotel were conveniently located, roomy and well ventilated. Furthermore, the program subjects were timely and speakers, for the most part, had their material well organized.

The local arrangements committee, under the direction of IAMFS Past-president, Ivan E. Parkin, efficiently and cooperatively provided pleasant and convenient facilities for the meeting.

President Charles E. Walton, in his presidential address, reviewed the past year's activities of the IAMFS. Emphatically, he called attention to the Association's efforts in spearheading several broad programs, and its efforts to enhance the professional

status of sanitarians. Several activities were cited, including: the 3-A Sanitary Standards program in which the Committee on Sanitary Procedures plays a vital part; the proposed model of a Sanitarians' Registration Law which was prepared by the Committee on Educational and Professional Development and which has been endorsed by the IAMFS; the National Committee on Uniform Labeling of Milk and Dairy Products which came into existence through the Association's Committee on Ordinances and Regulations; the National Mastitis Council which grew out of efforts of the IAMFS Committee on Dairy Farm Methods; and cooperation with other Associations having interests in common such as the National Association of Frozen Food Packers whose 9th Seminar was held in conjunction with the 49th Annual Meeting of IAMFS. Mr. Walton, in concluding his address, called for renewed efforts on the part of the Association and its membership, toward the fulfillment of the Association's objectives.

At the business meeting, significant action was taken. By majority vote, the Secretary was authorized to submit to the membership at large a mail



Out-going president, Charles Walton, (right) presents the new president, Ray Belknap, (left) Public Health Service, with the official gavel of authority.

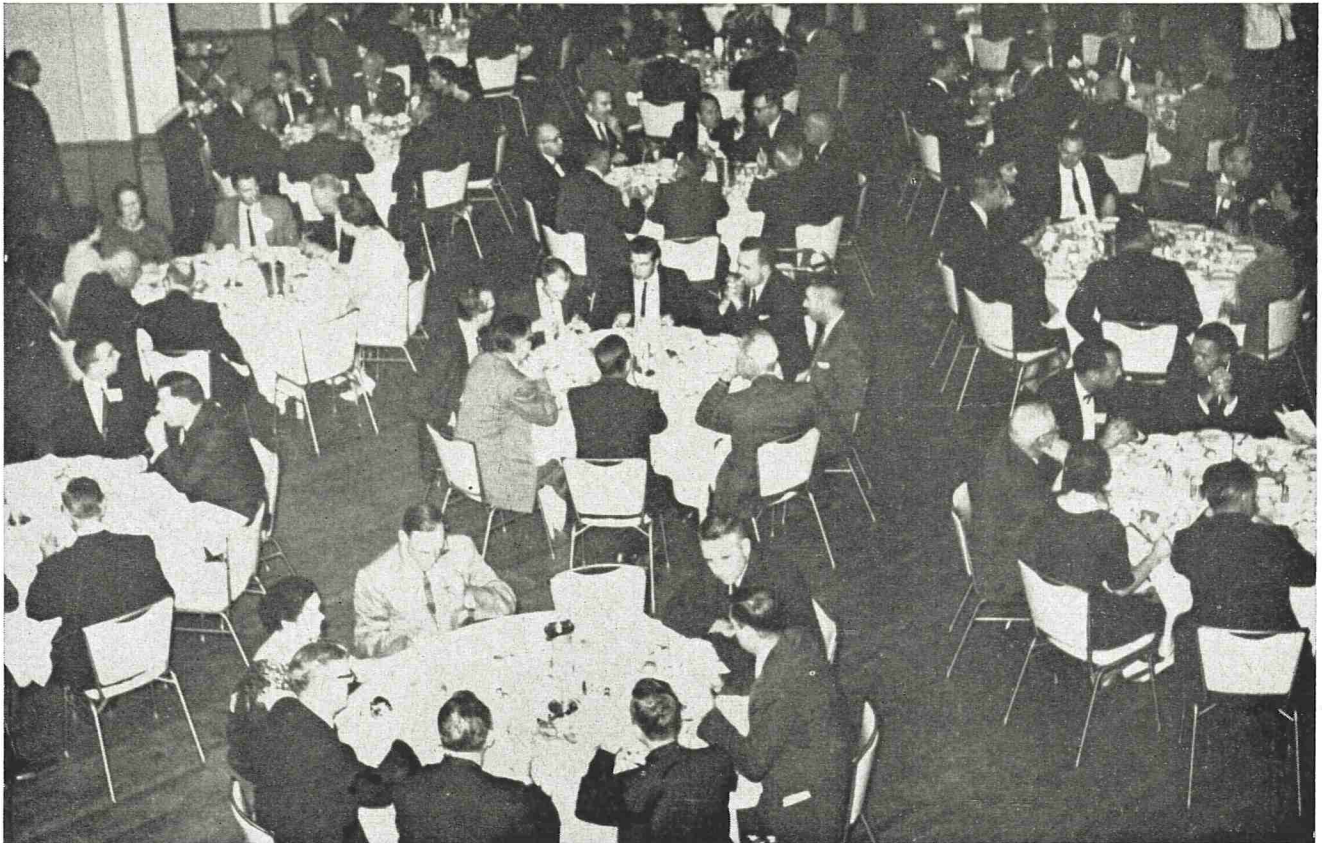
ballot whereby they could approve or disapprove a proposed constitutional amendment which advocates a change of the name of the Association to the International Association of Milk, Food and Environmental Sanitarians. Ballots will be mailed soon and members are urged to return them promptly.

In a tightly contested election for *Second Vice-President*, Mr. Fred E. Uetz, The Borden Co., 9 W. 141 St., New York 37, N. Y., won out over Mr. John C. Flake, Evaporated Milk Association, Chicago, and Dr. Richard M. Parry, Dairy Division, Connecticut

*President*, Dr. W. C. Lawton, Director of Laboratories and Quality Control, Twin City Milk Producers Association, St. Paul, Minn.; and Mr. Fred E. Uetz, newly elected *Second Vice-President*.

Mr. William Hickey, Public Health Committee, Paper Cup and Container Institute, New York, N. Y., has retired from the Executive Board after having served the full six-year term.

Concerning the election of Association officers, it was quite apparent from informal discussions taking place in various groups during the meetings that



The Annual Banquet held Friday evening, was well attended and received many favorable comments from the members.

Department of Agriculture, Hartford. Mr. Karl K. Jones, Director, Food and Restaurant Section, Indiana State Board of Health, Indianapolis, was re-elected *Secretary-Treasurer*.

The *President-Elect*, *First Vice-President* and *Second Vice-President* automatically advance to the offices of *President*, *President-Elect* and *First Vice-President*, respectively.

The Executive Officers of the Association now are as follows: *President*, Mr. R. A. Belknap, USPHS, Region V, Chicago, Ill.; *President-Elect*, Mr. John H. Fritz, Milk and Food Branch, Division of Environmental Engineering and Food Protection, Public Health Service, U. S. Department of Health, Education, and Welfare, Washington, D. C.; *First Vice-*

there is a growing dissatisfaction with the election procedures. The most common complaint heard was that a system which provides an opportunity for less than 10% of the membership (300 of 4200) to elect can hardly be considered fair and equitable. More and more sentiment appears to be developing in favor of a mail ballot for election of officers with publication in the *Journal* beforehand of the background and qualifications of nominees.

The Affiliate Council which met Wednesday, October 24, with Dr. R. M. Parry presiding, discussed at length ways and means of increasing membership in the Association and in providing assistance to the Executive Board of IAMFS in the election of members of the various Association committees. Richard



Here Mr. Bill Hickey (left), Paper Cup and Container Institute, is shown awarding the Past President's certificate to John J. Sheuring, University of Georgia.

March, professor, Dairy Industry, Cornell University, was elected president of the Council for 1963 and Sam Noles, Jacksonville, Florida, will succeed March as Secretary. The complete minutes of the Council meeting will be carried in the next issue of the Journal.

The annual banquet held Friday evening was highlighted by the presentation of the various Association awards. The Sanitarian's Award and accompanying check for one thousand dollars went to Mr. Larry Gordon, Director, City-County Health Department, Albuquerque, N. M. In recognition of outstanding service to the Association, the Citation Award was presented to Dr. Franklin W. Barber, National Dairy Products Association, New York. The immediate Past-President, Dr. John J. Sheuring, was the recipient of the Past-President's Certificate.

The 1963 Annual Meeting will be sponsored by the Central Ontario Milk Sanitarians Association in Toronto, Ontario, October 22-25, 1963. Judging from advance preparations already reported it promises to be an outstanding meeting.

Mr. M. W. Jefferson, Virginia Dept. of Agriculture (4th left), is pictured here with the members of the National Labeling Committee as they met on Friday morning. This committee is one of the many active groups in which IAMFS participates.



## ANNUAL MEETING

### NAFFP Seminar Features Discussion Of Frozen Food Industry Practices

The ninth seminar of the National Association of Frozen Food Packers was held October 24 in conjunction with the International Association of Milk and Food Sanitarians' Annual Meeting in Philadelphia. This session was arranged for the purpose of acquainting industrial, educational and governmental personnel with some of the latest important information about the frozen food industry.

For all those in attendance, the NAFFP made available a registration packet containing reprints of research reports plus other pertinent bulletins concerning frozen food technology and sanitation.

The booklet entitled "Five Steps to Sanitary Quality of Frozen Foods," NAFFP's manual, is of particular significance and was given attention by H. P. Schmitt, research director of NAFFP. Schmitt pointed out that on-the-job surveillance could be more easily and effectively undertaken with the (1) sanitary control equation (2) a watch and (3) a thermometer — all of which are explained in the bulletin.

The morning sessions were followed by discussions concerning sanitary practices in freezing fruits and

### I A M F S Recognizes Franklin Barber



Citation Award was presented to Mr. Franklin Barber, Dairy Products Inc., at the Annual Banquet on Friday evening by Mr. William Hickey. The complete citation will be carried in the December issue of the Journal.

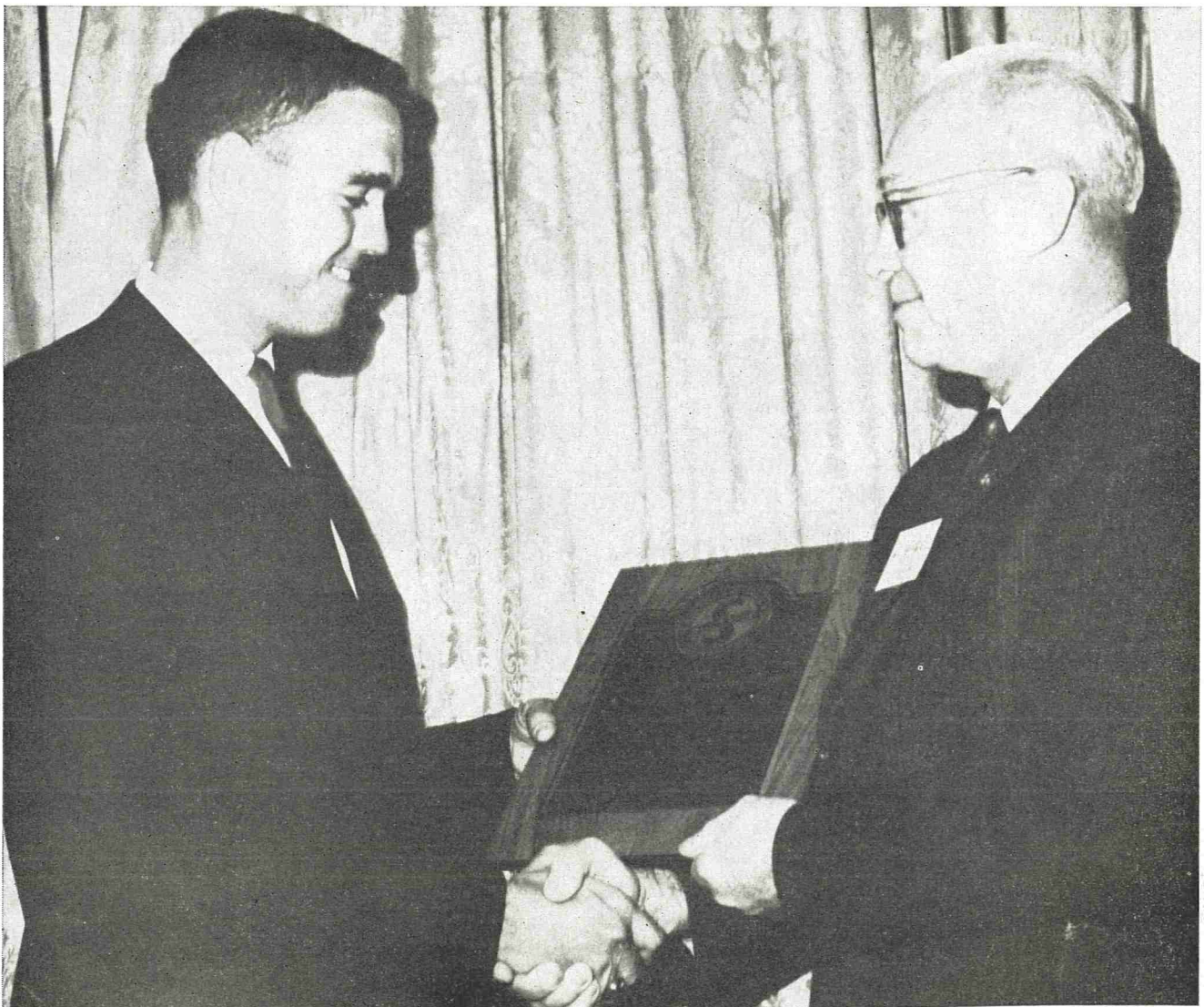
vegetables, prepared foods, poultry and seafoods. The seminar afforded those attending the opportunity to quiz the technical authorities on the many phases of the frozen food industry at the scheduled "Forum on Sanitation."

Among those speaking at the sessions were: Frank E. Fisher, chairman, IAMFS Committee on Frozen Food Sanitation; Ruth W. Engler, Stouffer Corp.; Dr. G. J. Lorant, General Foods Corp.; James Cameron, Morton Frozen Foods; Charles Walton, past-president IAMFS; A. W. Dutcher, Dulany Foods, Inc.; Joseph Barclay, Seabrook Farms Co.; Dr. M. F. Gunderson, Campbell Soup Co.; D. I. Murdock, Minute Maid Co. and H. P. Schmitt, NAFFP.

This seminar was the ninth of a series and was held at the Benjamin Franklin Hotel, Philadelphia, for the Penn-Del-Mar-Va area personnel and guests.



At the close of the 9th Annual Seminar sponsored by NAFFP in conjunction with the Annual Meeting, a luncheon was given by NAFFP for various guests and representatives.



Larry Gordon, left, Director, City-County Health Department, Albuquerque, N. M., receives the coveted Sanitariums Award from W. V. Hickey, chairman, Awards Committee. This prize includes the plaque shown plus a \$1000 gift. It is awarded to the most outstanding man in public health and sanitation. Congratulations to Mr. Gordon! His outstanding record speaks for his worthiness of the Award. In a very short time, Mr. Gordon moved up from a County Sanitarian to his present position of Director of a city-county health department. Under his able direction, nationally recognized programs of food sanitation and environmental health programs have been established. The complete citation will appear in the December Journal.



Mr. V. W. Green, General Mills scientist, is shown here addressing the Saturday morning session at the Annual Meeting. His topic, "Up in the Air," dealt with the relationship of airborne microbiology to environmental sanitation.

#### ANNUAL MEETING

## Floral Arrangement Program Highlights Ladies Schedule

Highlighting the women's entertainment of the Annual Meeting was a special floral arrangement program held on Friday afternoon, October 26th.

Miss Mary Jane Mowrer of Shreiner's Flowers, Paradise, Pennsylvania, was invited to present a demonstration of flower arranging with both artificial and real flowers. Miss Mowrer's presentation received favorable comments due, in part, to her use of artificial pieces.

Guided and unguided tours of many of the great historical sites in Philadelphia were available to the wives who cared to participate. These tours were conducted to Independence Hall, Valley Forge, Supreme Court Building, and many other of the great landmarks of United States history. Time was also allotted for shopping which the ladies were free to do at their convenience.

"Cheese Snacks" in the evening provided the ladies with the opportunity to get together and converse about their day's activities. They divided themselves into two or three groups so they could see more in the short time which was available.

Many of the wives were pleased that the Local Arrangements Committee did not schedule a full slate of activities for each day of the meeting.

#### ANNUAL MEETING

## Local Arrangements Cited For Fine Job

Transportation, registration, finances, entertainment, publicity, banquet, visual aids and ladies entertainment are but a few of the various committees set up by the Pennsylvania Affiliate's Local Arrangements Committee which served as the coordinator for the 49th Annual Meeting.

Much cooperation, effort, patience, time and work goes into planning a successful meeting such as the one held by IAMFS and the Pennsylvania Dairy Sanitarians Association.

The Committees did a superb job in carrying out the administrative as well as the working affairs of the meeting. The Local Arrangements Committee, headed by Ivan E. Parkin, consisted of the following committees and workers:

#### *Registration*

Herbert White\*  
John Muirhead  
Curt Chaffee  
Ray Anderson

#### *Transportation*

Russell Rooks\*

#### *Room Arrangements*

Francis Black\*

#### *Finance Committee*

Earl Cook\*

#### *Banquet*

R. F. Davenport\*  
Percy Collins  
Richard Weaver

#### *Publicity*

Charles Livak\*

#### *Ladies Entertainment*

Clarence Moss\*  
Joe Karsh

#### *Special Events and Milk Breaks*

William Snyder\*  
Henry McKenzie\*

#### *Visual Aids*

Howard Johnston\*

#### *Mixer and Reception*

Frank Ottino\*  
James Eck

#### *Entertainment*

Frank Ottino\*  
Roy Davenport\*

#### *General Greeting*

Lester Pletcher\*  
Joe Pelligrino  
steering committee:

F. Ottino  
C. Moss  
J. Muirhead  
I. Parkin

#### *Door Prizes*

Leonard Deubler\*  
Eaton Smith

#### *Speakers Hospitality*

Robert Keen\*  
Wase White

\*chairman



## ANNUAL MEETING

## Membership Takes Action On Resolutions Presented

During the business sessions of the 49th Annual Meeting several resolutions were presented and considered. Below is the text of those acted upon. Be it known that:

The following resolution was unanimously adopted by the membership:

WHEREAS, Mark D. Howlett, Jr., has served as a member of the Committee on Sanitary Procedures for thirteen years, and

WHEREAS, he has also represented this Association as a member of the Board of Trustees of the 3-A Sanitary Standards Symbol Administrative Council and

WHEREAS, he has now found it impossible to continue thus to serve the Association,

BE IT THEREFORE RESOLVED, that the Secretary of the International Association of Milk and Food Sanitarians in accepting this resignation, express to Mark Howlett the appreciation of the Association for his services and further express the wish and hope for his early return to good health.

Karl K. Jones  
Secretary-Treasurer

The following resolution was unanimously adopted by the membership:

WHEREAS, the Pennsylvania Dairy Sanitarians Association, has sponsored the 49th Annual Meeting of the International Association of Milk and Food Sanitarians, Ben Franklin Hotel, Philadelphia, Pennsylvania, October 24th to 27th, 1962.

BE IT RESOLVED, that we the members of the IAMFS express our sincere thanks for the cooperation and efforts made by the Pennsylvania Dairy Sanitarians Association, its officers, and friends who have worked so diligently to make this annual meeting a success.

BE IT FURTHER RESOLVED, that a copy of this resolution be sent to the President of the Pennsylvania Dairy Sanitarians Association, and it also be incorporated in the permanent minutes of the IAMFS.

Karl K. Jones  
Secretary-Treasurer

The following resolution was adopted by the membership:

WHEREAS, the Committee on Ordinances and Regulations at the request of the Executive Board, has completed a study of its stated objectives and scope of activities and,

WHEREAS, this study revealed that the area of activities in which this Committee might participate is unnecessarily limited by its stated objectives, and

WHEREAS, it will increase the effectiveness of the Committee and the services of the Association to the Membership if the objective is broadened;

THEREFORE, BE IT RESOLVED, that the stated objective and title of the present Advisory Committee on Ordinances and Regulations be expanded to permit the Committee to participate in activities related to other foods in addition to milk, milk products and frozen desserts.

John J. Sheuring, chairman

The following resolution was *not* adopted by the membership:

WHEREAS, it is the considered opinion of the 1961-1962 Presidential Advisory Committee on Constitution, By Laws and Resolutions that it would be in the best interests of the Association to carefully and fully evaluate, and make recommendations relative to suggestions concerning Constitution, By Laws and Resolutions which may be submitted to the Executive Board during the ensuing year, rather than hastily review each suggestion at the next Annual Meeting.

BE IT RESOLVED, that the President, at the Annual Meeting, appoint a Committee on Constitution, By Laws and Resolutions, consisting of five (5) members to review during the ensuing year, those recommended changes in the Constitution and By Laws, and those resolutions which may have been received by the Executive Board and Staff during the year.

BE IT FURTHER RESOLVED, that the Committee report to the Executive Board of its deliberations prior to the next Annual Meeting.

John J. Sheuring, chairman



Mr. James White, Cornell University, (right) was one of the lucky winners of the many door prizes given at the opening of each session. Here, Mr. L. Wayne Brown presents the Wisconsin Affiliate prize—a collection of Wisconsin cheese samples, what else?

# Abstracts Of Papers Given At The 49th Annual Meeting, International Association Of Milk & Food Sanitarians

The complete text of most papers which were presented at the Annual Meeting will be published in subsequent issues of the Journal.

*Responsibilities and Challenges of Change*, L. E. BURNEY, Director of Health Services, Temple University, Philadelphia, Pennsylvania. In a small health center in the heart of Ethiopia, there was a large poster with the following slogan, "Sanitation is a way of life." The way of life in this and other developing countries is different from ours, but there is one principle common to all of us: we are adapting continuously to change. You have heard the expression that nothing is certain except death and taxes; to this must be added 'change'. The health professions are affected by these changes in our society and environment—political, social and economic changes. We have helped to create some of these changes and to guide others. Our research, training and programs must be sensitive to change. Some of the changes affecting your profession and mine are related to an increasing population, urbanization, industrialization, age, character and mobility of the population. Health is now considered a right, not just a privilege.

Advances in research and technology in all the health science fields have been dramatic. The public demands this new knowledge be put to work. You and I are faced with magnified problems in a complex society requiring a variety of highly specialized skills. None of our professions can stand alone. There must be closer ties between operation in the field and the research in our universities—a two-way flow of ideas and problems. Our greatest hurdle is to learn to work together—to recognize our interdependence and be more concerned with what each of us can contribute than with what our isolated, professional role may be. The public demands this of us and, in the final analysis, whether we work for a university, an industrial organization or a governmental agency, the public is the ultimate consumer and our master.

These are challenging days for the health professions—the responsibilities are great, but the rewards are even greater. *Guiding Principles That Formulate Public Relations Theory*; by MALCOLM P. GROVER, Manager, Public Relations Department, Safeway Stores, Incorporated, Oakland, California — Addressing remarks on the subject presupposes the decision that public relations is a desirable activity for the food sanitarian.

To present properly the policies and activities of an organization, public relations must be an over-all activity. It is an operating philosophy which management must seek to apply in everything it says and does. It is the very essence of any organization.

Elements in public relations theory are: (a) consideration of fundamental matters, (b) organization involvement in decision, (c) evaluation of public interest.

Decisions on fundamental matters concerning the sanitarian or his organization must always be based upon the various publics involved, as their acceptance will determine the success of the action. Viewing the matters in the light of their relations effect is not to reduce the sanitarian values nor lessen carrying out the trust implied in the sanitarian

function. Public relations serves not only as an essential ingredient, but also as a major asset in accomplishing good sanitarian practices.

The element of involvement of all those affecting or affected by the decision is necessary to make the theory of public relations work. Decisions should be in the public interest, above and beyond the persuasive special interests. Decisions made in public interest will increase understanding and acceptance and will be an aid to enforcement of the decision.

Public relations theory is the foundation for relations practices which management uses to accrue maximum benefits to all functions of an organization.

*Public Relations in Practice*, NORMAN MYRICK, Milk Industry Foundation, Washington, D. C. — The massive criticism of dairy products and the dairy industry in the last five years offers a striking example of the baffling nature of public relations in practice. Few products have been subjected to such a barrage of unfavorable publicity as milk and milk products. Milk has been implicated in everything from heart disease and radioactive fallout to the farm problem and conspiracies in restraint of trade. The full power of the modern media of communication, newspapers, magazines, books, radio and television, has been marshaled to the attack. By any ordinary measure, milk long since should have been consigned to the realm of things that once were. But the facts are quite to the contrary. Four recent studies on consumer attitudes toward milk and dairy products show that there has been little change, if any, in consumption patterns because of cholesterol or fallout. Indeed, the principal change appears to be in butter consumption, and price is clearly the major factor in the shift to margarine.

The public relation lesson is obvious; mass coverage does not mean that communication has taken place, nor does it mean that if communication does take place that the communication has been accepted. Perhaps most significant is the indication this experience gives of the enormous difficulty that is involved in altering public attitudes. A final lesson suggests that the reaction to criticism of those who are associated with a given field is no indication of the reaction of those outside the field. People engaged in the dairy industry have reacted sharply to the criticism while people not directly associated with the dairy industry have reacted hardly at all.

*Specialized In-Service Training for the Sanitarian*, RICHARD E. CLAPP, Sanitarian Director, Community Services Training Section, Training Branch, Communicable Disease Center, Public Health Service, Atlanta, Georgia. Because a commonly understood or accepted definition of "In-Service Training" does not exist, for the purposes of this presentation the term is limited to training requiring a prepared instruction plan and learning situation, structured and formalized in teaching methods identified as a short course of instruction, and usually spanning a period of one day to three months. Fourteen goals of in-service training relating to the continuing education objectives of individuals, and sponsoring organizations are listed.

Specific areas of training of interest to sanitarians that are presented by the Public Health Service through the Robert A. Taft Sanitary Engineering Center, the Communicable Disease Center, and the Division of Health Mobilization are described and sanitarians attendance at these courses during the last fiscal year are indicated. A more general description of a large number of other training opportunities and facilities are given, including additional Public Health Service organizations, the Armed Forces, and other Federal agencies, colleges and universities, junior colleges and technical schools, state and local health departments, business and industrial organizations, and professional organizations.

A concluding statement points out that virtually any type of training desired is available, that the individual should develop his own plan of continuing education, that this training should be supported and encouraged by the individual's agency, and that training should not be concerned only with present needs but should prepare the individual for future growth in this field.

*Progress Report On The Activity Of The National Labeling Committee*, M. W. JEFFERSON, *Chairman*, Virginia State Department of Agriculture, Richmond, Virginia — The National Labeling Committee is an outgrowth of the Committee on Ordinances and Regulations of the International Association of Milk and Food Sanitarians which began in 1958. In October, 1960, a national meeting was called by the International Association, and invitations were sent to approximately 20 national organizations involved with the labeling of dairy products. It was the feeling at this meeting that such a national committee was needed and that industry would give its support. A temporary chairman and secretary were elected. A Subcommittee on Organization of the national committee was appointed. This organizational subcommittee met on three occasions drafting By-laws and developing functions of the national committee. A Finance Committee was appointed to explore means of financing. The objectives and working of the committee were considered by all committees and subcommittees involved with the formation of our National Labeling Committee.

On June 15, 1962, the National Labeling Committee held its first meeting in Atlanta, Georgia. Officers and executive committee members were elected, By-laws adopted and objectives projected. Representatives of 14 national and international professional and dairy industry associations have named representatives to the Committee. Information concerning the work of the National Labeling Committee has been directed to all regulatory agencies informing them of the purposes, objectives and structure of the Committee and requesting information concerning their thinking and suggestions. The services which the National Labeling Committee can provide on a national basis are outlined.

*The Curd-O-Matic System of Cottage Cheese Production—Its Purpose and Function*, W. F. MUELLER, *Stainless, Inc.*, VanNuys, California, — Automation in industry is essential. The ever increasing cottage cheese market is bringing about specialization and consolidation of production. This creates a need for practical and economical methods to produce a quality product in quantity. The Curd-O-Matic is completely automatic. The labor required is that used before and after the machine. The water usage is 500 gallons of city water to facilitate pumping and 600 gallons of refrigerated water for washing and cooling for each 1500-gallon vat. The time required to process a 1500-gallon vat is 12 minutes. This can be slowed down or speeded up, depending on plant requirements. The operator can double and triple-set vats when needed.

To insure quality, the machine is manufactured according to 3-A Standards and is completely covered to keep out plant heat and yeasts and molds which might be present.

Every vat of curd gets consistent treatment, a thorough washing and immediate cooling to 40°F. Desired moisture content remains constant. Creaming is done by a screw conveyor which gathers and mixes the curd while a calibrated amount of cream is sprayed on it, eliminating the need for violent agitation. All fines are recovered in usable condition. The Curd-O-Matic makes possible the production of large quantities of uniform quality cottage cheese at a minimum cost.

*Cottage Cheese Quality Control Problems*, L. G. HARMON, Department of Food Science, Michigan State University, East Lansing, Michigan — The organisms usually identified with spoilage of cottage cheese do not survive cooking at 130°F for 20 min. Most of the spoilage is caused by post-cooking psychrophilic contaminants which may enter from the wash water, equipment, air or creaming mixture. The coliform, psychrophile and yeast and mold counts in fresh cream vary over an extremely wide range indicating much variation in the sanitary conditions under which cheese is manufactured and packaged. Minimum contamination and adequate refrigeration are the most important factors in extending shelf-life. Incubation tests for shelf-life at temperatures above 55°F are unsatisfactory because they usually permit the development of lactic organisms and high acidity which represents a typical spoilage.

*Development of Microbiological Standards for Foods*, MORRIS SHIFFMAN, Chief, Milk and Food Section, City Health Department, Philadelphia, Pennsylvania — The arguments for and against microbiological standards for foods are reviewed. The arguments, pro and con, are classified into four groups: scientific, technical, administrative and legal. A general discussion of standards in environmental health and their purposes is presented. Several basic questions relative to the establishment of standards in environmental health are presented. The most difficult technical problem is found to be the establishment of standards for indicators of fecal contamination. Administrative considerations of microbiological standards are discussed and it is pointed out that standards can be a help and a hindrance to the program administrator. Whether the standards are upheld in courts will most likely depend on the manner in which they are applied by the regulatory agency. The standards should be related to the sanitary conditions under which the food was processed. The nature of the food chain requires close inter-governmental cooperation. A suggestion is advanced that a clearing-house for information on microbiological standards be established. A plea is also made for more reciprocal arrangements among food protection agencies.

*Planning and Operation of the Total Sanitation Program*, WALTER PURDOM, Director, Division of Environmental Health, City Health Department, Philadelphia, Pennsylvania — Program planning is not a decorative sophistication to be practiced when the demands of program operations slacken momentarily and allow a few idle moments for thought. To the contrary, planning is an essential element in sound program for which sufficient time must be made available. Those who feel that planning is a superficial chore requiring only the manipulation of a few generalized formulas and mathematical factors will be disillusioned. Planning is a tough, demanding task requiring the full imagination and energy of even the most gifted administrator. Even when new proposals face opposition or rejection, the administrator

must renew his planning efforts with persistence and determination. The opportunity to better meet the environmental needs of the community through improved program planning presents a real challenge to all of us engaged in the field of environmental health.

*Control of Physical, Chemical and Bacteriological Quality of Swimming Pool Water*, JAMES AULT, Director, Sanitation Division, Knox County Health Department, Knoxville, Tennessee — Water which is safe to swim in should be safe to drink. The process used to control the quality of water in artificially constructed swimming pools is very similar to the process used in treating drinking water supplies with the exception of settling. Certain physical, chemical and bacteriological qualities should be maintained in swimming pool water. In order to maintain safe swimming pool water the pool must be properly operated and maintained, and certain tests must be conducted on the water to indicate the quality being provided.

*Sanitation In The Space Age*, V. W. GREENE, Aerospace Research, General Mills, Inc., Minneapolis, Minnesota — The classic concepts of environmental sanitation have become an integral part of our way of life in this age. The advent of the space age requires an expansion of these concepts.

We are faced today with phenomenal advances in transportation and communication. Are our sanitary surveillance techniques and regulations, basically geared for parochial communities, adequate to maintain the public health in a world served by supersonic carriers? Is our knowledge and training sufficient to meet the demands for ultraclean environments imposed by advances in medicine and industrial technology?

We must be ready to consider such new problems as cleaning and disinfecting the hardware and materials being

developed for space travel and exploration. We must gain a perspective of the environmental health problems of people confined in sealed capsules for long time periods. We must start thinking about the control of exotic and as yet undiscovered agents from other planets, the control of microbial dissemination from our world to others, the logistics of interplanetary quarantine.

In addition to all of this, we must continue to provide the inhabitants of this world with a safe, clean and healthy environment.

*The Sanitarian in Public Health—A National Survey*, ISRAEL, LIGHT, U. S. Public Health Service, Washington, D. C. — Some 16,000 survey forms were mailed. The data from 7,300 respondents were processed. No definition of "Sanitarian" was used. The median age of the total group was 41.3 years. The two extremes of "under 5 years" and "30 years and over" of experience accounted for one-third of the total group. Eighty per cent worked for some level of government. About 40 per cent had a title other than "Sanitarian." Fifty per cent of the total group said that their primary activity was inspection-testing-quality control and related work. About 75 per cent of the group reported their area of greatest professional competence as follows: milk, 33%; food, 30%; sewage and industrial waste, 7%; and water, 6%. About 60 per cent of the respondents have a college degree or better. Twenty per cent of Bachelor degrees are B.A.

There was a marked tendency to specialize in training, in education, and in desire to pick up additional knowledge, at the expense of the "Generalist" category. A final statistical report will include these and other features in considerable detail.

# News and Events

## President Kennedy Praises Dairy Industry In Message

The ribbon-cutting ceremonies opening the Dairy Exposition on October 28, were highlighted by a message from President John F. Kennedy.

In his message to Joseph S. Cunningham, executive vice-president of Dairy Industries Supply Association, President Kennedy said:

"I am pleased to extend my greetings and best wishes to the members of the dairy industry and the organizations taking part in the 23rd Dairy Industries Exposition.

"The dairy industry plays a vital role in building and maintaining our national health and well-being. Milk and dairy products are among our most important foods nutritionally, furnishing many of the essential ingredients to good health, particularly among our children and young people.

"The dairy industry also ranks as one of our major industries, including dairy farms in every state of our nation and the many firms that process and handle milk and dairy products as they move from farmer to the consumer. Our efficiency in the production and distribution of food is one of the major factors contributing to the greatness of this nation. We have abundant food, not only for our own people, but for distribution to millions of peoples in other lands. The dairy industry has played a large part in the success and I hope this Exposition, with the opportunity it presents for exchange of new and better ideas, will contribute to even greater success for your industry and our nation in the future."

The President's message was read by DISA President Paul Girton, of the Girton Manufacturing Company, at opening ceremonies, featuring Miss Sandra Tibeau, American Dairy Princess, before several thousand delegates and guests.

## ANNUAL GOURMET DELIGHT IS HELD BY JOHNSON & JOHNSON

Once again the Cheese Cupboard, a traditional gourmet event sponsored by Johnson and Johnson's Filter Products Division, scored a hit at the Dairy Industry Supply Association convention.

Some 2000 delegates attended this year's exhibition of cheese, held from 6 to 8:30 p.m. at the Marlborough-Blenheim Hotel in Atlantic City, October 29 through November 1.

Nearly 150 choice cheeses from 34 states were brought together in a colorful display, each cheese decorated with a flag identifying the state in which it was made. Cheeses ranged in size from a 185-pound Swiss wheel to midget cheddars weighing only a few ounces.

Among distinguished cheese tasters on opening night was newly crowned American Dairy Princess, Sandra Tibeau of Auburn, Washington. Several guests from other countries—France, Mexico, Switzerland and India—added to the international flavor of the occasion. While all of the cheeses were manufactured in the United States, many of them originated in Europe and other countries.

Included in the mouth-watering collection of cheeses were these varied types: Edam, Swiss, Brick, Gorgonzola, Brie, Bleu, Trappist, Stilton, Cream, garlic, sage, Longhorn, Frankenmuth and a host of others.

This was the seventh Cheese Cupboard to be given by J & J's Filter Products Division for members of the dairy industry. What started out as a small hospitality suite has become an immensely popular tradition that promises continued taste delights for cheese lovers in the years ahead.

### Message From Celebreeze Given To Guests Of FDA-FDI Session

The Sixth Annual Conference of the Food and Drug Administration and The Food Law Institute held November 26, in Washington, D. C., was highlighted by a dinner in honor of the FDA. Mr. Boisfeuillet Jones, Special Assistant to the Secretary, Health and Medical Affairs, addressed guests and gave them a message from the Honorable Anthony J. Celebreeze, Secretary of Health, Education and Welfare.

These Annual Conferences bring together leading representatives of government, industry, and consumers to discuss areas of mutual interest arising from food, drug and cosmetic legislation. This year's



**A ROYAL VIEW OF CHEESE:** At the Cheese Cupboard in Atlantic City, N. J., hosted by Johnson & Johnson's Filter Products Division, newly crowned American Dairy Princess Sandra Tibeau holds up two of the more than 100 champion American cheeses on display.

program was devoted to looking ahead and anticipating problems which may arise in the future.

Executives from various companies representing several industries were present to address the session about where each of their industries now stands in regard to fulfilling its obligation to supply the consumer with safe and wholesome products. A projection of their views to the conferees as to what developments may be expected in their industries during the next ten years and the type of regulation, particularly self-regulation, which may be expected in the future were also given. Among those present to speak for industry were: Mr. C. W. Cook, General Foods Corp.; Mr. Francis C. Brown, Schering Corporation, and Mr. Paul J. Cupp, Acme Markets, Inc.

The Conference closed with a question and answer panel made up of representatives of the FDA. The panel discussed problems addressed to it by consumer and industry representatives in the area of food and drug law.

# Attendance Record Set At Exposition

## ILLINOIS TEAM CAPTURES CONTEST FOR FOURTH TIME

With the strains of "Auld Lang Syne" from the world's largest organ filling Convention Hall in Atlantic City, N. J., on the afternoon of November 2, the 23rd Dairy Industries Exposition closed after a week in which more than 20,000 dairy industrialists and guests visited the seaside resort.

The six-day show covered seven acres in Convention Hall and featured 350 exhibits by the world's major suppliers and manufacturers of dairy and food processing machinery, supplies and services.

At ceremonies closing the show, George L. Huffman, Ex-Cell-O Corporation, chairman of the Exposition Committee, said: "Aisle traffic has been heavy all week and exhibitors report it has been an exceptionally good sales week."

Joseph S. Cunningham, executive vice-president of Dairy Industries Supply Association, sponsor of the Exposition, reported that exhibitors were gratified by the large attendance which was an increase of nearly 2000 persons above the attendance figure for the show held two years ago in Chicago. The Dairy Industries Exposition, a biennial event, is the largest regularly scheduled trade exposition in the world.

The attendance was by no means restricted to only persons in the United States. Almost 400 visitors from countries from all parts of the world attended the show. They came from 40 countries in Europe, Latin America, Africa, Australia and the Near and Far East.

These visitors' comments registered unanimous enthusiasm, ranging from an awestruck reaction to the large size of the equipment to an appreciation of the interested helpfulness of the exhibitors.

A young man from Haiti observed that exhibitors in the 350 booths at the show were not as preoccupied with getting business as he expected "but were anxious to cooperate by giving full and detailed information." The Haitian, Mr. Jean Sterlin, representative of an Alliance for Progress cooperator, l'Institute de Developpment Agricole et Industriel, called the show "fantastic." This 23rd Exposition was Mr. Sterlin's first. He said, "I had heard the American Dairy Show was the greatest. Now I know it."

According to Mr. C. J. Macdermott, Brisbane, Australia, the 1962 Show surpassed the previous years'. Macdermott, who heads Pauls Ltd., an integrated dairy processing operation in Australia, found much larger and better finished units, as well

as a greater range of packaging at this year's Exposition than at earlier shows.

"This is a tremendous exhibit which you would never see anywhere else in the world," declared Macdermott.

Conversation among the guests from abroad was not limited to dairy talk. Visitors were very interested to hear several of the Latin Americans talk about the recent Cuban crisis. Several planned tours to the Exposition from Latin America had been cancelled because of the crisis, but many Latin visitors made the trip anyway and were guests of the U. S. during the time of the hemispheric crisis.

### 28 Colleges Compete

An aspect of the Exposition which creates widespread attention and attracts many viewers is the Collegiate Students' International Contest in Judging Dairy Products.

The University of Illinois captured the All Products Bowl and a graduate fellowship of \$2300 in the 1962 Judging Contest held Monday, October 29, the second day of the Exposition. Teams from 28 colleges and universities from all parts of the United States competed.

It was the fourth straight year that the three-man team of dairy products judges from Urbana, coached by Professor Joseph Tobias, had won the top honors in the annual competition co-sponsored by Dairy Industries Supply Association and American Dairy Science Association.

Second-ranking team in the All Products judging and winner of a \$2150 graduate fellowship was the team from Michigan State University, coached by Professor J. M. Jensen.

The University of Connecticut's team, coached by Professors Leonard R. Dowd and Lynn Glazier, took third place in the All Products judging and received a \$2000 fellowship. Connecticut's team was composed of two girls and a boy—the girls invading what has been almost exclusively a male function.

The top individual in judging All Products was Thomas Perry of Michigan State University. A 21-year old senior from Akron, N. Y., Perry received a 25-jewel watch for his achievement.

Second-ranking individual was George L. Schaufelberger, 21-year old University of Illinois senior from Greenville, Illinois. He received a silver medal mounted on a desk set. The third-place winner of the judging was Jon Stanwick, Brookings, S. D. He is also a senior and attends South Dakota State College. His prize was a bronze medal mounted on a desk set.

## OFFICIAL URGES STRICT CONTROL OF ADDITIVES

An official of the government's Meat Inspection Division recently urged strict control of new chemicals and drugs which, if not used properly, could leave harmful residues in animal meats.

These drugs and chemicals are safe when prescribed by properly trained veterinarians and physicians, K. E. Taylor, D.V.M., reported in the November issue of the *Journal of the American Veterinary Medical Association*.

Some of these same products added to animal feeds by a feed manufacturer without academic training, or misused by a farmer, are potentially harmful, he warned in his article, "Control of Chemical, Drug, and Biological Residues in Meats."

He strongly urged that effective labeling be provided and strictly adhered to. He pointed out that the Meat Inspection Division, USDA, has the responsibility for assuring safe and wholesome meats for the American public.

Approximately 20 insecticides, 11 feed additives, and 7 therapeutic agents have already been approved by the Meat Inspection Division, Dr. Taylor said. However, if they are not used properly, even they leave a residue in the meat derived from cattle, sheep, calves, swine, and goats. It is the job of the Meat Inspection Division to detect at what level these residues cause the meat to be unfit for consumption.

## Alvie Claxton Elected DSI President Other Officers and Directors Chosen

At its Sixteenth Annual Meeting in Atlantic City, October 28, Dairy Society International elected as president Alvie J. Claxton of Pinehurst, N. C. Mr. Claxton is national trade director for Beatrice Foods Company.

Vice-Presidents named were: D. G. Colony, Manton-Gaulin Mfg. Company, Mass.; Owen K. Hallberg, Dairy Maid Products Cooperative, Wis.; Maurice Macari, Paris, France; Mitsugi Sato, Sapporo, Japan, Snow Brand Milk Products.

Re-elected treasurer was Roy E. Cairns, Waukesha Foundry Company, Wisconsin, and secretary, Gordon T. Jeffers, Carnation Company, California. George W. Weigold was reappointed as managing director.

Chosen by the new Board of Directors as chairman was Peter P. Weidenbruch of Fond du Lac, Wiscon-

sin, president of Damrow Brothers Company, with outgoing president Lyman D. McKee, dairy farmer of Madison, Wisconsin, as vice-chairman. Norman E. Quible was renamed assistant treasurer and Gertrude C. Kalec as assistant secretary.

Claxton, the new president, has been with Beatrice Foods Company since 1919, working up from a plant employee to hold many important posts in the company and in the dairy industry. He has served as vice-president and eastern manager, and is currently a member of the Board of the parent company, and has been president of Meadow Gold Dairies of Pennsylvania.

## John Taylor, Indiana Head Of Dairy Division, Retires

Effective October 1, 1962. Retirement ended over 30 years of faithful service and notable achievement for Mr. John Taylor, Director, Division of Dairy Products, Indiana State Board of Health.

Beginning employment with the Indiana State Board of Health in 1931, Mr. Taylor served as a field milk inspector until 1933 when he was appointed head of the Division of Dairy Products. He attended Purdue University where he earned his degree in Dairy Science followed by a masters degree from Michigan State University. After his formal education, he turned to teaching at an Agricultural College in Fargo, North Dakota. Following this, he returned to Indiana to work with industry and later as a County Agent in Southern Indiana.

Mr. Taylor has left behind many milestones in the field of milk production and sanitation. At the time he was named head of the Division of Dairy Products, pasteurization was merely a term with few practical implications. Through a devotion of many years of unprecedented service, Mr. Taylor's direction resulted in almost revolutionary accomplishments for the Division. During his period of directorship, the Grade "A" Milk Program was established and a foundation was set to provide the milk products industry with further advancements which are still being attained today. Mr. Taylor was also instrumental in formulating the Interstate Milk Shipper's Agreement.

Indicative of his devotion to and interest in his work, are the many professional activities engaged in by Mr. Taylor. He has remained an active member of the IAS, IPHA, APHA, American Dairy Association, Central States Association of Food and Drug Officials and the International Association of Milk and Food Sanitarians for many years. His member-

ship in these associations has been felt by all who worked with him.

Mr. Taylor and his wife are making their home in Evansville, Indiana, which is close to the town in which Mr. Taylor's boyhood was spent. Of immediate interest to them is the extensive travel which they have planned for the retirement years.

As Mr. Taylor is the holder of the longest IAMFS membership in Indiana, may we take this opportunity to extend to him sincerest wishes for a well-deserved retirement and to compliment him for his contribution to the public's health.

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## ENOS HUFFER NAMED CHIEF OF ILLINOIS MILK CONTROL

Announcement was made October 29 by Illinois State Health Director, Dr. Franklin Yoder, of the appointment of Enos G. Huffer to the position of chief of the milk control division.

Huffer has been employed with the health department in Illinois for 32 years. He is a former head of the bureau of survey and has accepted special emergency assignments with two other governmental health agencies during the past.

Holder of a bachelor's degree from the University of Illinois' College of Agriculture with concentrated training in milk sanitation, Huffer has been concerned with developing Oriental markets for dairy products.

He is an active member of the International Association of Milk and Food Sanitarians and past president of the Illinois Milk Sanitarians.

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## CDC OFFERS COURSE IN EPIDEMIOLOGY

A multidiscipline course in Principles of Epidemiology will be offered at the U. S. Public Health Service's Communicable Disease Center, Atlanta, Georgia, January 14-18, 1963, as a part of the continuing program of the Center's Training Branch.

Designed to provide public health workers with a basic understanding of how epidemiological techniques can be used in an approach to the solution of problems in the preventable disease field, the course is offered for the following categories of public health personnel: physicians, dentists, veterinarians, nurses, laboratory workers, environmental health personnel and other members of the public health team.

Further information and application forms may be obtained from: Communicable Disease Center, Atlanta 22, Georgia, Attention: Chief, Training Branch.

## US Health Service Dubious Of LSU Fluoride Studies

A study of the feasibility and effectiveness of fluoridating milk for the reduction of dental caries is being carried on by Louisiana State University. Some press reports have indicated that the research is revealing that significantly fewer cavities occur in the teeth of children who drink one-half pint of milk each day to which one milligram of fluoride has been added.

The United States Public Health Service and the Food and Drug Administration are giving this development interested attention. From the public health standpoint, there are many practical problems connected with any milk fluoridation program. For example, if fluoride is added to milk in areas where there is already a water fluoridation program, serious results might ensue. While it is indicated that water fluoridation is effective in reducing cavities, it is known that too much fluoride can have most deleterious effects on teeth enamel.

Public Health authorities also envision myriad problems in connection with plant control of application of fluoride to milk.

The Public Health Service is guided, in connection with any fortification of milk, by the Council on Food and Nutrition of the American Medical Association and by the Food and Nutrition Board of the National Research Council. PHS would defer to these bodies as to whether it would be in the public interest to fluoridate milk. However, as of now, PHS feels that the fluoridation of water provides the best method of consumer protection in this area.

<sup>1</sup>Reprinted from *Dairy Industry Newsletter*, Vol 8, No. 20.

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### CLASSIFIED AD

Assistant Professor in Dairy and Food Microbiology

Applications are invited for the above post in the Department of Dairy Science. The salary is in the range of \$7000-\$8700 with excellent prospects for advancement.

Candidates should preferably hold the Ph. D. or equivalent degree, experience in research and/or teaching would be advantageous. Duties will include research, teaching, assistance with the direction of graduate students and extension work with the dairy and food industries. Duties to commence April 1, 1963, or as soon thereafter as convenient.

Applications providing personal data, academic qualifications and experience, and a list of published work, together with transcripts, names of four references, and a recent photograph, should be sent to the Head, Department of Dairy Science, University of Alberta, Edmonton, Alberta, Canada.

This post was previously advertised in the Spring of 1962 but because of the small number of applications received, possibly because of the lateness of the advertisement, no appointment was made.

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## UNEXPECTED ATTENDANCE

# Successful First Meeting Held By Newest Affiliate

Congratulations to Mississippi, the newest IAMFS affiliate, for a very successful First Annual Meeting!

Attendance far exceeded all expectations for the First Annual Meeting of the Mississippi Association of Sanitarians held at Jackson, Mississippi, November 5 and 6.

The Association has 101 members and of these, 77 were present at the meeting. According to A. R. Russell, Secretary-Treasurer, "the interest and enthusiasm was especially good" and the members took the opportunity to express their sincere gratitude to each of the speakers for his contribution to their "successful" meeting.

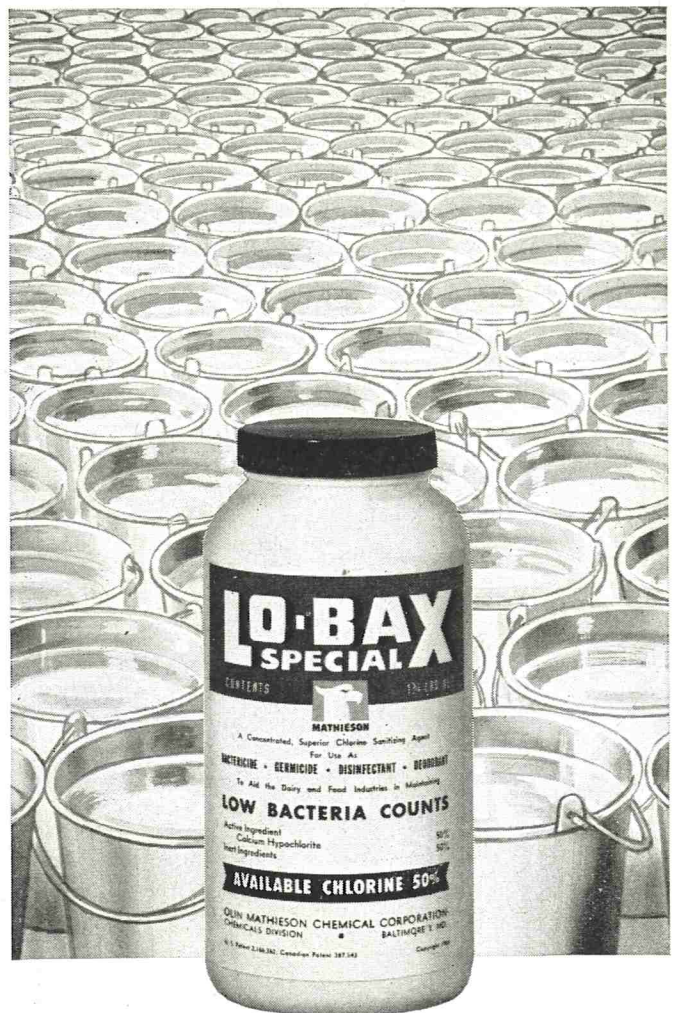
Opening remarks were given by Dr. A. L. Gray, Mississippi Health Officer, who praised the Association for its accomplishments in the field of public health and extended his sincerest wishes for continued success.

As Mississippi is a recent affiliate of the International Association of Milk and Food Sanitarians, H. L. "Red" Thomasson, Executive Secretary of IAMFS, was on hand to welcome the membership and to address them on "Your International Association."

The program agenda was very timely and well diversified. It included sessions on "Problems In Food Handling" by Dr. J. A. Milne and Mrs. Margaret Love; "Safety Standards for Coin-Operated Self-Service Dry Cleaning Equipment" by E. C. Handorf; "The Community Merit Program" by Lyle Carroll; "Rural Water and Sewage" by S. S. Haffley; "Some Aspects of the Milk Control Program" by D. W. Taylor; and "New Problems In Environmental Sanitation" by Joe Boyer.

The meeting was concluded with a business session at which the Association's new officers were elected. They are: A. K. Monroe, *President*; J. L. Lary, *President-Elect*; J. L. Knight, *First Vice-President*; J. T. Watts, *Second Vice-President*; A. R. Russell, *Secretary-Treasurer*; and two *Auditors*, James Martin and Hemby Davis.

During the business meeting, Drs. A. L. Gray and J. A. Milne were named honorary members.



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## EVENTS IN DECEMBER

December 2-4: Western States Dairy Convention, Cosmopolitan Hotel, Denver, Colorado. Write: C. E. Dunlap, 955 11th St., Denver, Colorado.

6: Evaporated Milk Association, bi-monthly meeting of the Industry, Builders Club, Chicago, Illinois. Write: E. H. Parfitt, 228 N. LaSalle St., Chicago, Illinois.

10-12: Illinois Dairy Products Association, Annual Convention, Conrad Hilton Hotel, Chicago, Illinois. Write: M. G. Van Buskirk, 309 W. Jackson Blvd., Chicago 6, Illinois.

12-14: Wisconsin Dairy Foods Association, Inc., Annual Convention, Schroeder Hotel, Milwaukee, Wisconsin. Write: A. E. Van Thullenar, 222 S. Hamilton St., Madison, Wisconsin.

13: Evaporated Milk Association, Industry Meeting, Sherman House, Chicago, Illinois. Write: E. H. Parfitt, 228 N. LaSalle St., Chicago 1, Illinois.

26-29: American Association for the Advancement of Science, Symposium, Section O, Philadelphia, Pennsylvania. Write: George W. Irving, Jr., chairman, Section O, United States Department of Agriculture, Ag. Research Service, Washington 25, D. C.

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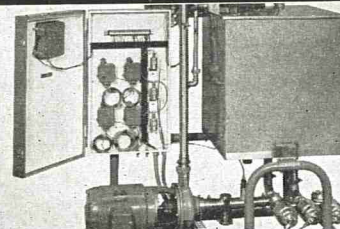
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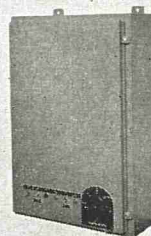
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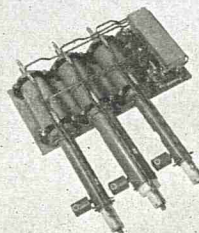
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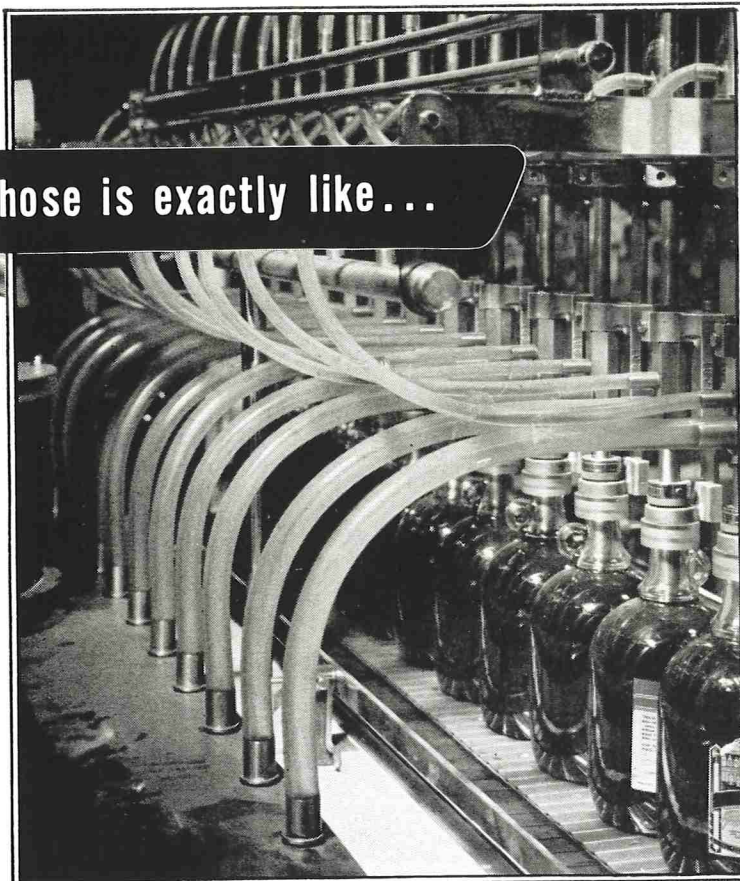
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**FLEXIBLE** — Retained throughout the full range of normal operating temperatures, Tygon's rubber-like flexibility speeds set-ups, requires a minimum of couplings and fittings, simplifies revisions in the system as needs change.

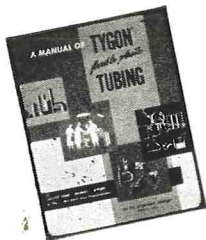
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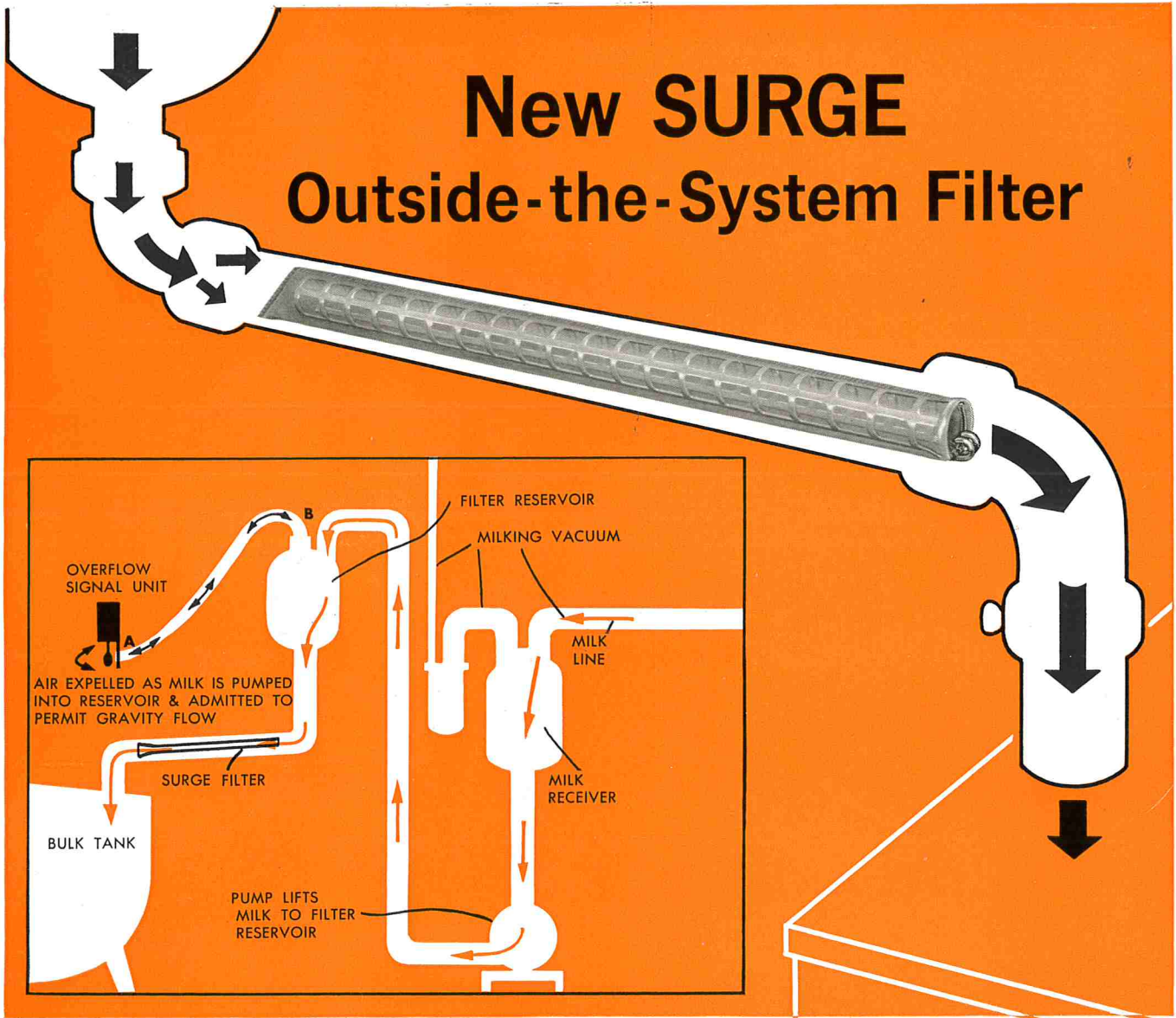
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