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MILK and FOOD TECHNOLOGY

Official Publication

International Association of Milk and Food Sanitarians, Inc.

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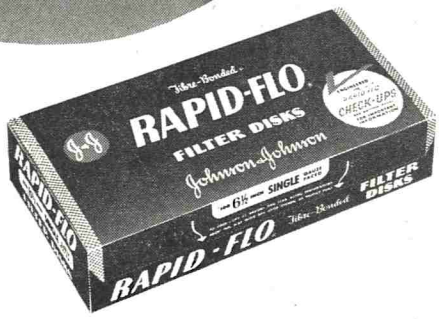

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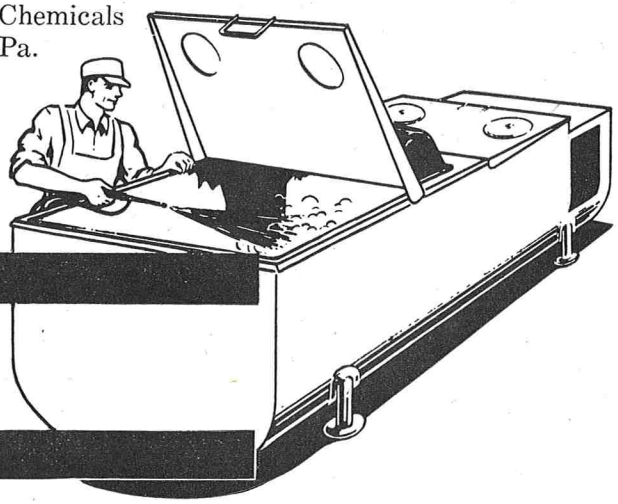

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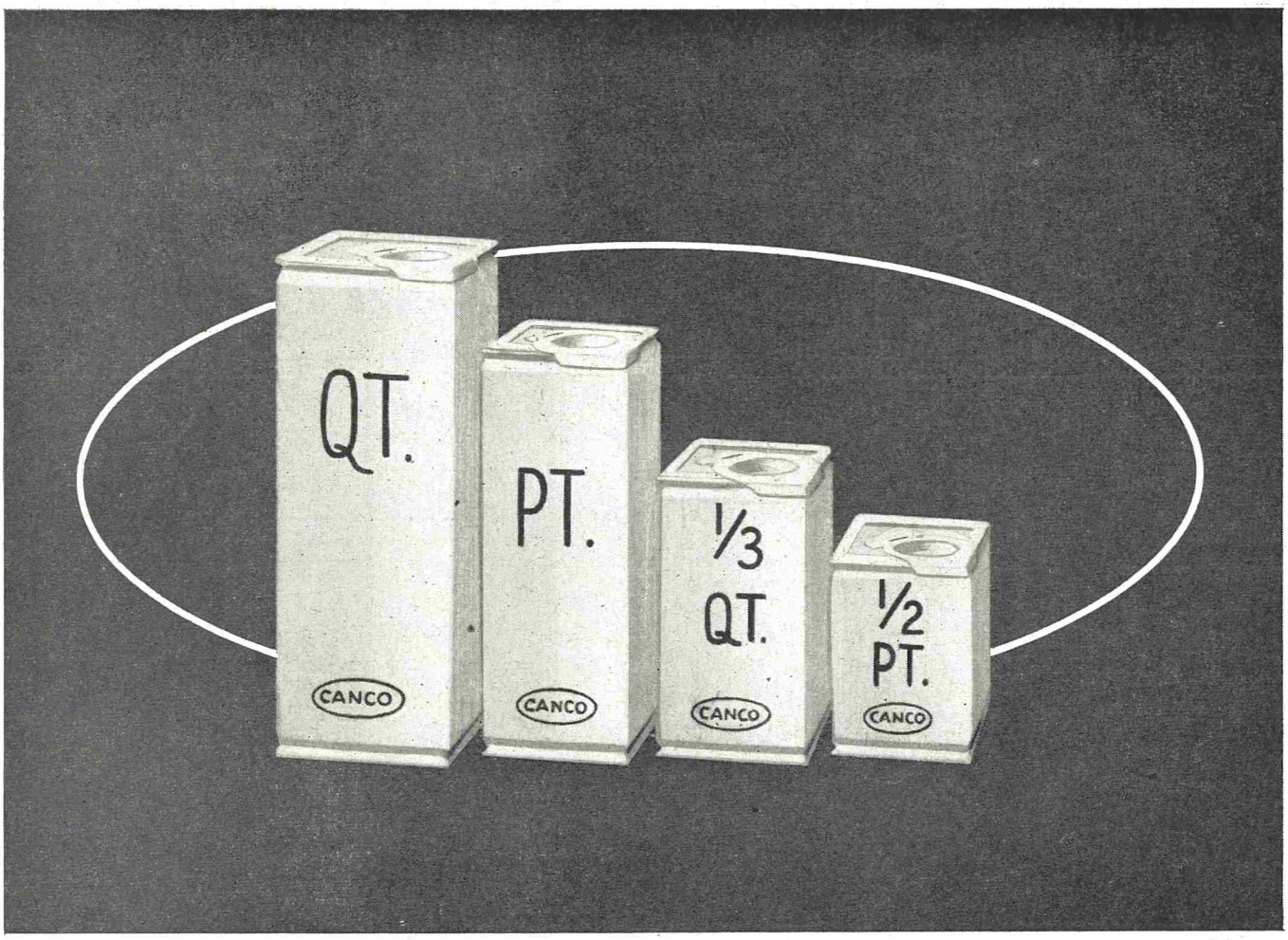

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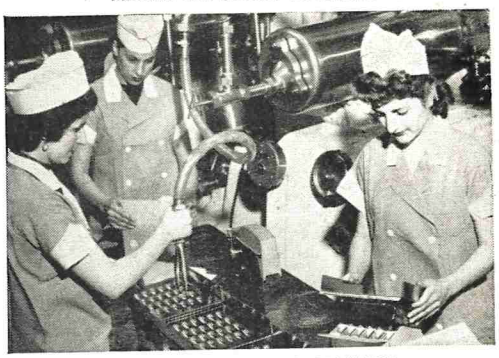

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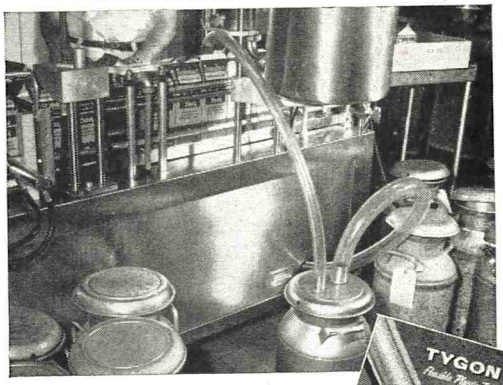

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including the monthly schedule of classes. Almost immediately, however, it became the accepted means of communication between the Health Department and the restaurant industry. When it was discovered that some persons taking the written tests could not read, or perhaps only very poorly, the "Newsletter" invited them to go to classes without taking the examination, if they desired. Not only those who were semi-literate, but many others made nervous by the thought of taking a test accepted this invitation passed on to them by the operator receiving the "Newsletter". When someone inquired if their sister "could just sit in on the second session of the class" because she had enjoyed the first session so much, th "Newsletter" again invited as many as desired to attend and to bring their friends if they wished. Attendance picked up! The reputation of the classes as interesting and something that would be helpful to everyone began to become established.

Since the initial start, the "Newsletter" has also served as a medium for passing on new information from the literature, for introducing new phases of the food sanitation program, and for timely suggestions on sanitation. The local newspaper early had used the "Newsletter" as a source of information to be passed on to the general public as news about this program. Now they began to base feature stories of general interest and information on items appearing in the newsletter. These articles were successful. After all, everyone ate food; everyone was interested in food sanitation! Perhaps work toward a goal of persons valuing and demanding good food service could be carried on successfully with the training program, as had been hoped.

Several areas were explored to help in this direction. Radio and television stations were contacted, and they were encouraging. The Health Department acquired a motion picture camera and short action shots of the classes appeared in the television newscasts, together with an explanation of what they were for and how they operated. Several community groups became interested and asked for adaptations of the material to be presented before them — business women's groups, senior Boy Scouts, nursing groups, Civil Defense wardens, etc. The Health Officers News Digest's folders entitled "Sanitation Follies" were found to be especially useful as the basis of discussion with such groups.

Increased information and awareness of germs and their transmission in our food service personnel group had led to reinstituting routine swabbing of utensils in all establishments as a teaching device. Proper utensil sanitization and use of single service containers was being stressed. Dissatisfaction with the usual inspection report for eating and drinking establishments had led to the development of a check list of *methods* to supplement the regular one covering construction and facilities. When an opportunity to put on a thirty minute television program occurred, we were ready to tell the story of our food sanitation program as it affected the individual. This show was one of a series dealing with medical problems, entitled "House Call", and a good viewer rating had been established. Our presentation included scenes of waitresses using *poor* techniqus followed by the *correct* method of setting tables, clearing tables, serving butter, and serving ice in a water glass; of cooks sneezing on the job and remembering to wash their hands at handwashing facilities conveniently located in the kitchen next to the cooking center; of sanitarians taking swab tests and the laboratory processing the swabs; and of a portion of our training classes using some of the slides utilized in our second session.

We had a good response. Many comments were made indicating we had increased the individual's awareness of food sanitation, of food service methods. To supplement this in our food sanitation program, the check list and accompanying code on food service methods was used at least once in each establishment. Since many of the items required observation at different times of the day (as during preparation, cooking, and then serving a meal) the partially completed check sheet with accompanying code was left with each operator to be completed by the time of the next regular inspection. Thus, for the first time in many cases, we had self-inspection being carried on. Continuation of such self-inspection has been encouraged by the district sanitarians, for it engendered a feeling of cooperation and teamwork between the operator and the sanitarian. Each district sanitarian keeps a small loose leaf notebook containing, on a separate sheet for each establishment, a summary of several previous monthly inspections and utensil swab counts. Most operators are anxious to see how their record stands, whether they have corrected violations noted on previous inspection, and what will go into the notebook as comments from the present inspection.

Currently, the food service training program has been operating in the City of Tulsa two years. Because of a high rate of turnover in food service personnel, the proportion of persons not passing the test

has remained about the same - one out of five. The number of persons attending classes, however, is closer to two out of five. Special sessions of the classes are given, on request, at larger restaurants, school cafeterias, church kitchens, hospital kitchens, and private club kitchens. The manager of the establishment guarantees a minimum of ten in attendance and usually sees that all of his employees attend. Food processors, such as bakeries, and food manufacturers have been included in the training. A second, continuing class has been set up for workers' convenience in a district health center in the negro district. In three outlying county towns, classes are being held in the new health center auditoriums and kitchens. These classes include *all* food service personnel, including grocery store workers, for at least part of the instruction. A fourth county town is presently considering a similar suggested ordinance establishing food service training.

And so, today, the Food Service Training Program has served to stimulate an awareness and a concern for proper food service in a substantial segment of the population of this community. It is hoped that through continued community-wide contacts in the newspaper, television and through the school curriculum this awareness and concern will grow. For it has been truthfully said that a successful enforcement program cannot long exist without the understanding and the support of the community.

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THE RESPONSIBILITY OF THE DAIRY INDUSTRY TO THE CONSUMER[1]

J. C. Flake

Evaporated Milk Association, Chicago, Illinois

Serving the best interests of the consumer is the responsibility of industry and of regulatory officials. This requires that both be adaptable to change; have a long-range point of view; and concentrate on problems of the future rather than those of the past. Emphasis is needed on fundamentals in milk quality and sanitation; increasing consumer appeal; and continual increase in efficiency of dairy production.

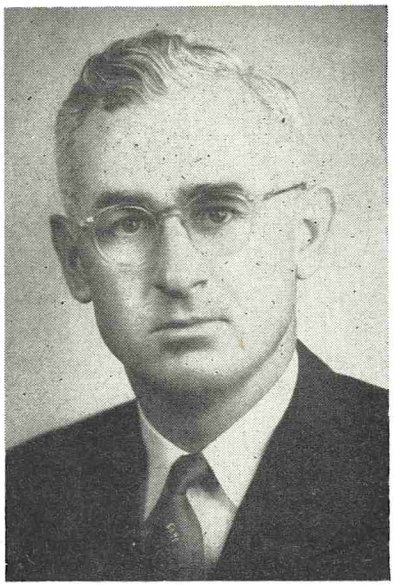
If the responsibility of the processors and distributors of milk and dairy products can be reduced to a single paragraph it might well be expressed somewhat as follows:

The job of the dairy industry is to solve present and future problems in the best interests of the consumer. This means recognizing and evaluating the profound changes that are taking place in the dairy industry, in all agriculture, and throughout the economy. It means developing the capacity to influence as well as to adapt to these changes. Especially it means looking to the future with a long-range point of view.

The dairy industry has come a long way in the United States. Both the industry and regulatory agencies can be proud of the many accomplishments. A great dairy industry has been built that can amply meet the present and foreseeable consumer demands for healthful, high quality milk and dairy products. The great achievements in quality and sanitation have given consumers full confidence in all dairy products. Much credit is due the efforts and foresight of the industry, the medical profession, regulatory officials, and agricultural colleges.

Yet there are still many problems, and the future promises to bring even more. Industry must take the lead in solving these problems. Regulatory agencies must help. The responsibility and objectives of industry and regulatory authorities have a wide area of common ground. This area can be even broader. A key objective of both groups should be to expand their joint efforts to serve the consumer and not merely to conform to rules and regulations.

As a background to discussing a few of the problems and objectives of the dairy industry, perhaps brief consideration should be given to two factors that demand prime attention in today's planning. These are the matter of change and of having a long-range point of view.



Dr. J. C. Flake joined the Sanitary Standards staff of the Evaporated Milk Association upon completion of his graduate work in Dairy Industry at the University of Wisconsin in 1940. He is a graduate of the University of Tennessee, received his M. S. degree from Purdue University and Ph. D. degree from the University of Wisconsin. He did milk sanitation work for USPHS during World War II and at present is Administrator of the Sanitary Standards program of the evaporated milk industry.

There have been many editorial and news references to the tremendous pace and importance of change in recent years. For example, Earl L. Butz, former Assistant Secretary of Agriculture, recently stated (9) that "A scientific explosion is occurring in our midst."

C. F. Huffman, President of American Dairy Science Association, told the 1957 annual meeting of that organization (4) that agricultural colleges have "failed to realize that science and agriculture are changing so rapidly that our concepts of education are having a hard time to keep up with the signs of the times."

A recent editorial in the *American Milk Review* (6) stated "There is a deep, fundamental current of

[1]Presented at the 44th Annual Meeting of the International Association of Milk and Food Sanitarians, Inc., at Louisville, Kentucky, October 7-10, 1957.

change sweeping through the dairy industry. The change is primarily a product of people and the way in which they work. On the one hand are the new markets and the new types of markets that have evolved as the nation has grown. On the other hand are the dislocations and adjustments created by new knowledge and new technology. Fewer cows and fewer farmers are producing more and more milk. Fewer plants are distributing more and more milk over wider areas than ever before."

". . . The status quo cannot be preserved. He who would oppose change because it is change or because it disturbs his own private world must share with the impatient radical the responsibility for the turmoil that results. Time cannot be made to stand still nor can it be made to move faster. The great task facing the industry is to grow with the times, logically, soundly, fairly."

The necessity of bold planning for the future has been ably discussed by Ralph J. Cordiner, President of General Electric Co. Mr. Cordiner said that new imperatives are at work today which give the business leader, and others, no practical alternative except to take a long-range point of view. These imperatives include:

1. Pressures of a changing population. In 10 years U. S. consumers are expected to want 40 per cent more goods and services, to be produced by only 14 per cent more workers. This means productivity must be increased by forward-looking technological improvements.
2. The decision of the American people that steadily rising levels of living, plus economic stability, are both desirable and achievable. (Dairy farmers and their families expect to participate in this increase in the standard of living.)
3. The forceful pace of technological change, and the rise of research and innovation as established techniques of competitive business enterprise. Few substantial businesses today can expect to grow without a dynamic plan for continuous innovations in processes, facilities, methods, organization, leadership, and other phases of the business (*2*).

It is most important for the dairy industry and for regulatory officials to have this long-range point of view and to concentrate on problems of the future rather than those of the past.

In the discussion which follows, consideration will be given to three of the objectives of the dairy industry. It is believed that these objectives should be shared by official sanitarians:

1. Emphasis on fundamentals in milk quality and sanitation.
2. Increasing consumer appeal.
3. Continual increase in efficiency of dairy production.

EMPHASIS ON FUNDAMENTALS

Enforcement of sanitary milk regulations has greatly improved milk quality and safety, and encouraged higher per capita consumption. Official supervision of the production of milk and milk products is in the public interest and is a necessary function of government. The record in this field is too successful to warrant abrupt or drastic changes, and none are suggested here.

However, in recent years many people have questioned the public health significance and necessity of certain sanitary regulatory items (*10*).

It is believed that it is time to re-examine the elaborate structure of milk sanitation regulations and control. The public health must be safeguarded, but this duty should not be pursued with reckless disregard for the consumer's pocketbook. The emphasis should be on specifications for herd health and quality standards as measured by objective tests (*12*).

Milk sanitarians are familiar with the report of the National Research Council on Sanitary Milk Control (*3*). This report indicates the need for only a limited number of basic requirements to insure a wholesome milk supply. The report concludes that more emphasis should be placed on three groups of requirements with respect to facilities and practices which are significant in the production of sanitary milk. "These essential features of sanitary milk production on farms are:

1. "Healthy cows and other factors reducing possibility of presence of pathogenic bacteria, such as fly control, potable water, and sewage disposal."
2. "Clean utensils given proper bactericidal treatment. This condition was associated with clean cows, clean milking barns, and clean milk houses provided with hot water and two-compartment wash vats."
3. "Prompt cooling of milk to 50° F. or below which was always accomplished by electric refrigeration, except that milk to be pasteurized promptly after production need not be cooled."

"Good production practices and essential facilities should be the goal and most particulars of structure and design should be recommendations and not requirements of the sanitary laws. Such emphasis on the important factors of milk sanitation would maintain and improve the measurable quality attributes of

milk while reducing the number of requirements which tend to harass dairymen and to restrict the movement of milk between producing areas and new market areas."

This report also states that "There is no public health reason to increase the severity of satisfactory sanitary milk regulations, making them more detailed and rigid, when the milk industry of any market regularly complies with them. This applies to the regulations affecting milk production, processing, and distribution as well as to the standards for the quality of milk."

After a lengthy investigation, a U. S. Senate Committee reported in 1951 (*1*): "Unfortunately many local health ordinances have been adopted that go beyond the need for protection of the public. The design and operation of some indicate a desire to protect the status quo of producers or distributors as much as, if not more than, the public health. A system of trade barriers has grown up in the milk industry that has retarded the free flow of milk both intrastate and interstate."

Fortunately, much attention has been devoted by industry and regulatory agencies to the fundamentals of milk sanitation and to what can be done to facilitate the free flow of high quality milk. Progress has been made, but a great deal more work is needed in this field by both groups. It should be the objective of industry and regulatory officials to provide consumers with milk and dairy products, having all the characteristics that make them desired as food, at a reasonable price and with a minimum of rules and regulations.

INCREASING CONSUMER APPEAL

The dairy industry and regulatory agencies can be proud of the role they have played in improving the nutrition of the nation. Not only has milk-borne disease been largely eliminated, but there are many positive indications of improved nutritional health of the people. Dairy foods have done more than any other group of foods to improve the nutrition and well-being of the population. These products have been particularly important in increasing the intake of calcium, vitamin D, and high quality protein.

A dramatic example of the value of milk and dairy products was given recently by Dr. A. A. Weech of Children's Hospital, University of Cincinnati (*13*). Dr. Weech discussed the contribution to human welfare of the fortification of milk with vitamin D. He stated that today it is difficult to find a case of rickets, and most graduating medical students have never seen one. He further stated, ". . . It is perhaps brash to attribute the miracle of the disappearance of rickets to any single commodity. I am not alone, however, in holding the belief that the widespread practice of fortifying milk with vitamin D has been *the* most important factor. This viewpoint has been ably supported by the Council on Foods and Nutrition of the American Medical Association . . . at the time of the last tabulation in February, 1955, there were listed 340 different brands of evaporated milk in this country, all of them fortified with vitamin D. The opinion seems justified that this almost universal fortification of evaporated milk has done more than has anything else to eradicate rickets in the very segment of the population least liable to avail themselves of what we may call the newer knowledge of nutrition."

However, it is widely recognized that milk consumption in the United States falls well below the amount recommended by nutritionists. Therefore, a major objective of the dairy industry and of milk sanitarians should be to encourage ways of increasing consumer appeal and expanding consumption to levels more nearly in line with nutritional needs.

Keeping prices as low as possible will help do this. Studies have shown that per capita sales of milk tend to increase with a decrease in price and that people with low and medium incomes tend to make more use of low-priced milk than those in the high income groups (*1*).

Another way to encourage higher consumption of milk and dairy products is for the dairy industry and regulatory agencies to stress the positive attributes of the products and to build these up, rather than the negative aspect of freedom from disease-producing organisms. This means emphasis on food value, cleanliness, flavor, keeping-quality and composition. People drink milk because they like it and for its nutritional value. Attention should be directed to the value of the product itself and to improving the product, rather than appealing to the fear complex by reference to "safety" which implies near escape from some hazard. The dairy industry and sanitarians inform the public that they have escaped illness caused by milk when its safety and protective measures are emphasized (*8*).

Certainly, every practical effort must be made to insure the safety of milk and dairy products. However, this problem has been largely solved through adequate pasteurization and other processes, plus protection of the finished product from contamination.

In this connection it may be well to remind ourselves that pasteurization is still the one positive

safeguard for a milk supply. In spite of all the refinements in regulations and inspection of milk production, it is impossible to depend on the human element. The one dependable safety measure is adequate pasteurization and protection of the pasteurized product (7). This is a strong argument against burdening the price of milk with unnecessary detail and frills in farm production controls, when the maximum in impractical and costly regulations still will not give postitive protection without pasteurization.

However, more can be done to improve the flavor and keeping-quality of milk. The increase that has occurred in the time between production and consumption makes this particularly important for fluid milk. With the farm tank and alternate day pick-up, outer-market sales, and intermittent delivery to stores and consumers, it is not uncommon for well over a week to elapse from the time milk leaves the cow until the pasteurized product is consumed. This necessitates more and more attention to clean production methods, clean milk handling equipment, enzymatic action and other chemical changes, adequate refrigeration on the farm and in the plant, and clean plant equipment. The complete sanitation of all post-pasteurization equipment is of prime importance to keeping-quality as well as to the safety of the milk.

Continual Increase in Efficiency of Dairy Production

Another major objective of the dairy industry is continual increase in efficiency. Sanitarians must help achieve this objective. While the necessity of ever increasing efficiency applies to all phases of production, processing, and distribution, this discussion is directed to dairy farm production.

In considering the importance of increasing efficiency of milk production it is necessary to recognize some of the changes that are taking place, and are expected in the future, in agriculture as a whole, as well as in all of industry. It is no longer news to mention the great increase in industrial productivity in this country. Productivity in the United States has been increasing about 2 per cent a year for nearly a century. However, the editors of *Fortune* have predicted that in the next quarter-century it will probably increase at an average of 3 per cent a year. If this extra percentage point materializes, it will have a profound effect on the economy, for production per man-hour will double in less than 24 years.

Productivity has increased rapidly in recent years in certain branches of agriculture. Efficiency in dairy farming has lagged behind, but fortunately it is beginning to catch up. The means are available for greatly improving the efficiency of dairy production. It is up to the dairy industry to see that they are applied. Regulatory officials and sanitarians must not impede this progress. From here on the economics of the problem must be considered. Will the farmer's and the consumer's pocketbooks stand the recommendation or requirement? While farming is a way of life, it is also a business. It must be a sound business.

During the next 20 years, American agriculture is expected to be called upon to increase its output by some 30 to 40 per cent on approximately the same amount of land as is in use today, and with fewer farm workers. Population is expected to increase about 35 per cent to some 220,000,000. Also economists foresee a doubling of the nation's total economy with an increase in per capita income of some 60 per cent.

The necessity of increasing the efficiency of milk production has been well expressed by Professor Herrell DeGraff of Cornell University (5):

"A small herd of mediocre dairy cows can no longer produce a net income that is appealing to large numbers of families compared to what they can earn at alternative employment. This will be even more true in the future than it is now."

"A hard and fundamental fact that has not been properly recognized in the present politically inspired yapping about agriculture, is that a farm family can produce, from agriculture, a comparable level of living with non-farm families only by steadily increasing their volume of output — per hour, per day, per year."

The following statement from Professor W. E. Petersen of the University of Minnesota is particularly applicable to this problem (*11*):

"Dairying is in for the greatest revolutionary change in its entire history. The objective is an enormous increase in efficiency — the measure of which is to be the pounds of milk per acre and pounds of milk per man-hour. We have the technological and practical knowledge that will enable us, on the average, to double the milk produced per acre and increase by four times the amount of milk produced per man-hour. In addition to this increase in efficiency we shall give more attention to making the job more attractive to the worker and we shall raise some serious questions about control measures now enforced as to whether or not they contribute or hinder advance toward the objective of furnishing consumers with the best quality product to serve their best interests."

"To attain these objectives we must have better cows, make greater use of roughage, mechanize the dairy farm, and above all have an open mind toward new developments."

This discussion is not meant to infer that only large commercial dairy farms can survive. Dairy production is largely a function of the family farm and probably will continue to be so. Small herds are still profitable in some sections of the country where the farm operation is diversified or where the farmer has some outside employment. However, regardless of the size of the herd, more and more efficiency is necessary in the production, storage and feeding of forage; in the housing, feeding, milking and management of the dairy herd; and in the handling of the milk. This efficiency is in the interest of the consumer because it will increase the production of milk; decrease the cost; help promote consumption of milk and dairy products; and will contribute to the nutritional health of the people.

Before concluding, it should be pointed out that sanitarians and industry must plan for the future with full regard to the effect of regulations and control measures, and all of their activities, on the competitive position of the dairy industry. There is a limit to the food intake of the consumer and to his expenditures for food. Numerous other foods compete directly with milk and dairy products. Moreover, every commodity and service in the economy competes for the consumer's dollar.

Butter has lost half of its per capita market in the past 20 years. Vegetable oil products are a significant factor in the frozen desserts picture. Filled milk has made large gains. Vegetable protein products are on the market as dairy substitutes. The early feeding of solid foods, containing no milk or dairy products, to infants has decreased their milk intake. Such foods are also gaining importance in geriatrics and in the feeding of invalids.

The future of the dairy industry is bright but it is not guaranteed. A constructive attitude and cooperative effort by all concerned will bring success.

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REPORT OF COMMITTEE ON APPLIED LABORATORY METHODS — 1957[1]

This year the Applied Laboratory Methods Committee sponsored actual laboratory research on a few selected problems in addition to continuing to review the literature on pertinent subjects. Seven subjects were selected for study and seven subcommittees were appointed to handle the selected problems.

BIOASSAY AND CHEMICAL TESTS FOR FOOD POISONING

This subcommittee consisting of Earl F. McFarren, *Chairman*, and Ralph L. Gostilow, reviewed the work that has been done in testing for stapylococcus food poisoning and paralytic shell fish poisoning .

The subject "Food Poisoning" recently has been brought up to date in the well known book by Dr. G. M. Dack (*1*), which is now in its 3rd Edition (1956). However, there have been some very recent advances in methodology of (*a*) determining the presence of potential food poisoning staphylococci in food (*b*) determining the probable scource of staphylococci in incriminated food, and (*c*) determining the ability of individual strains of *Staphylococcus aureus* to produce enterotoxin.

The sanitarian is constantly searching for more rapid methods for detecting the presence of potential food poisoning organisms. One of the principal drawbacks of the methods commonly used for enumerating microrganisms in food is the long incubation time required in growing the organisms. In many instances, a food item is consumed prior to the time that the results of examination are available. This is particularly true when tests are being conducted for food poisoning organisms such as staphylococci.

The common media and methods which are used to enumerate S. *aureus* in foods are well known and will not be discussed here. Mossel and Vendrig (*2*) have reported much success with the use of a drop plate method of plating on Chapman's medium. They found the surface colonies of S. *aureus* which developed on such plates to be easier to distinguish from the aerobic bacilli which grow on this medium than similar colonies growing in pour plates. Also, the colonies developed may be used directly for coagulase tests.

Wilson *et al.* (*3*) have described a rapid presumptive test for coagulase-positive staphylococci in foods. Briefly, this involved enrichment in mannitol brain heart infusion broth with 5% NaCl. The culture is incubated on a shaker for 5 to 6 hours at 35° C., a gram stain made, and the coagulase test run. This test is reported to detect the presence of staphylococci at populations as low as 5×10^5 per gm. in foods with much higher populations of other organisms, and in populations as low as 5×10^3 when present in pure cultures. The total time involved in running this presumptive test is only 7 to 9 hours and appears to offer a considerable advantage over other common procedures used today for determining the presence of these organisms.

The problem of determining the ability of strains of S. *aureus* to produce enterotoxin is still a difficult one in most laboratories. The "Dolman kitten test" has been reevaluated by Matheson and Thatcher (*4*) with encouraging results. In most instances, definite vomiting was observed after intraperitoneal injection of culture filtrates of enterotoxigenic strains. Only in a few instances, when resistant cats were used or where very small amounts were injected, vomiting did not occur. No "false positive" reactions were obtained with control preparations under normal conditions or with four uninoculated media. Based on 315 animal injections they "---- suggested that for most biological tests such results would be considered to have a high order of positivity."

Further studies by Thatcher and Matheson (*5*) showed that the enterotoxin of S. *aureus* is a separate and distinct entity from the *alpha-, beta-, or delta-*lysins. It was noted that the lysins could be completely removed from culture filtrates by boiling for 15 minutes and then incubating with ascorbic acid (5 mgm. per ml.). This treatment should reduce the chances of "false-positives" in the "Dolman kitten test" for enterotoxin.

Filtrates of 12 food-poisoning strains of S. *aureus* were shown to produce a characteristic response when added to Ringer's solution in which lengths of small intestine from rabbits were suspended (*7*). No response was observed on addition of filtrates from 12 pyogenic strains.

Much work has been reported recently on bacteriophage typing of staphylococci. This could be a useful tool in matching strains isolated from food with those isolated from potential sources infection. How-

[1]Presented at the 44th Annual Meeting of the INTERNATIONAL ASSOCIATION OF MILK AND FOOD SANITARIANS, INC., at Louisville, Kentucky, October 7-10, 1957.

ever, the ability to produce enterotoxin apparently is not restricted to particular phage groups. Thatcher and Simon (6) found wide variations in the ability of strains of staphylococci to produce coagulase, phosphatase, alpha- and beta-hemolysins, and enterotoxin within a phage group. They concluded that coagulase production was the most neearly consistent single indication of toxigenicity among the characteristics tested.

The literature and unpublished research on paralytic shellfish poison has recently been reviewed (8) However, this review has not had wide circulation; as a result, many sanitarians are probably unaware of recent developments in the methods of assay for the poison. Furthermore, some of the recent developments have not as yet been published; this report serves only to review briefly these developments and to indicate where they have been or soon will be published.

For control purposes, the tentative standard procedure (9) for determining the concentration of paralytic shellfish poison has been a mouse bioassay. In the spring of 1955, the U.S. Public Health Service sponsored a Canadian-United States Conference on Shellfish Toxicology (*10*) to review the progress made following the use of this tentative procedure as modified in 1950, and to discuss recent developments that might further improve the assay. At that time, the isolation of the poison in pure form by Schantz and associates (*11, 12*) was announced. These papers on the purity and proof of purity of shellfish poison have been accepted for publication and should appear about October of 1957. At the same meeting (*10*), the suggestion was made that the purified poison be used as a reference standard for the bioassay, and the U.S. Army Chemical Corps offered a limited quantity of the purified poison to the U.S. Public Health Service for this purpose. As a result, a study was made of the requirements for preparation, distribution, and use of the standard. On the basis of this study an "interim plan" for utilizing the purified poison to standardize the bioassay was drawn up by the U.S. Public Health Service (*13*). Following the issue of this "interim plan," a collaborative study based on the procedures outlined therein was conducted. The results of these studies will be presented in a paper by Schantz, *et al.* (*14*), at the Association of Official Agriculture Chemists Meeting in October of 1957. These studies indicate the basis for establishing certain standard conditions to determine the micrograms of purified poison equivalent to one mouse unit (CF value), and demonstrate the usefulness of the reference standard in assaying poisonous clams.

Although the bioassay appears quite satisfactory for the assay of high toxicity shellfish (*14*), it may underestimate the poison in low toxicity shellfish by as much as 60 per cent, due to the effect of salt. It also leaves much to be desired in cases where mice are difficult to obtain and keep in condition for assay. A chemical test for the poison would have the advantage of eliminating these difficulties. It is possible, based on the information reported by Schantz, Mold, and Lynch (*15*), that the purified poisons from the Alaskan Butler clam and the California ocean mussel give characteristic colored compounds with 3, 5-dinitrobenzoic acid, or picric acid in alkaline solution. A paper on the "Chemical Determination of Paralytic Shellfish Poison in Clams" will be presented (*16*) also at the A.O.A.C. meeting in October 1957; and it will be proposed that additional collaborative studies on the bioassay and chemical assay be conducted in order to establish whether these methods should be adopted as "official methods" of analysis.

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ANTIBIOTICS IN PRODUCER'S MILK

This subcommittee consisting of R. B. Parker, *Chairman,* and B. M. Barney, conducted a letter survey to determine the importance of the problem of antibiotics in milk. A questionnaire was mailed to a total of 128 academic personnel, regulatory officials, and industry representatives. The questionnaire was concerned with: (*a*) extent of contamination; (*b*) possible analytical methods; (*c*) extent of cooperation of farm groups in emphasizing the antibiotic problem; (d) the awareness of the industry regarding possible sensitization of human consumer; and (*e*) evidences of a deliberate attempt to control bacteria by the addition of anitbiotics to milk.

The surveyed areas were split into four sections and three groups.

Sect. 1 — Eastern States	Group A — Ed. institutions
Sect. 2 — Central States	Group B — Enforcement agencies
Sect. 3 — Western States	Group C — Industry laboratories & associations
Sect. 4 — Canadian Provinces	

The tabulation below indicates the interest shown in the survey. Eighty-two of 128 questionnaries were returned.

	No. Inquiries	Number of replies	Per cent replied
Section 1	36	20	56
Section 2	56	38	68
Section 3	25	17	68
Section 4	11	7	63

In general, response to the questionnaire brought out several points of interest to the sanitarian. Only 21% of the industry group felt that the antibiotics problem was a serious one, whereas, 35% of the regulatory officials and 43% of the educational representatives felt that the problem was, indeed, a serious one. These results are somewhat surprising because a large portion of the information appearing in the literature has indicated that the problem was very serious as far as industrial groups were concerned. Although a number of those answering the question indicated that their assumptions were based on a definite analytical method, only a few indicated the use of a routine control program. Much of their information, therefore, appears to be the result of very tenuous evidences or of simply blaming all starter failures on antibiotics.

The response to the question on the cooperation of farm groups in emphasizing the importance of discarding milk after a cow has received antibiotic therapy indicated that definite efforts are being made by some producer groups. The University of Wisconsin Extension Service has done a particularly good job in this regard. However, much more work apparently needs to be done on the part of farm groups and extension officials in emphasizing not only the economic but the public health hazard of including antibiotics, particularly penicillin, in the milk supply. Several procedures, including the starter activity test, the Neal and Calbert Wisconsin test, and the disc method, were reported to be used as possible criteria for rejecting milk containing antibiotics. However, only 12 of the 82 responding to the questionnaire indicated that such a procedure had been used in their organization. Most responses indicated simply that if a starter failure occurred it was assumed that the milk contained an antibiotic.

Only five of the individuals responding to the questionnaire felt that there was any evidence of attempts to control the bacteria count in milk by the deliberate addition of antibiotics. On the other hand, responses to the question indicated that only a limited number of people appreciated the possibility that the ingestion of antibiotics, particularly penicillin, could serve to sensitize the human consumer. This would suggest that education, both of the producer and the milk

manufacturer, is a prime factor in the elimination of antibiotic contamination of the milk supply.

The responses from eight manufacturers of antibiotics surveyed indicated that they also are concerned with the problem of antibiotics in milk, but from a slightly different standpoint. Specifically, the manufacturers were asked if they had any information which might contribute toward the development of a worthwhile rapid test for antibiotics in milk. One manufacturer replied that since sensitization reactions occurred primarily among those persons ingesting milk containing penicillin, the assay of penicillin in market milk was the only problem involved. Another manufacturer submitted the very detailed tentative method apparently in use at the Division of Antibiotics, Department of Health, Education, and Welfare.

In summary, it may be stated that the development of a satisfactory analytical tool for the detection of antibiotics in milk at the plant level, remains to be accomplished. It is also apparent that milk producers are not now using those analytical tools available to them, and that much of the difficulty attributed to the contamination of milk by antibiotics can be traced to this specific situation.

STAINING PROCEDURES FOR THE DIRECT MICROSCOPIC EXAMINATION OF DAIRY PROCDUCTS

The subcommittee composed of D. I. Thompson, *Chairman,* and G. W. Shadwick studied the application of two widely used staining procedures to the examination of reconstituted non-fat dry milk. They also compared the Levowitz and Weber stain (L-W) with the Acid and Water Free Stain (AWF) when used for staining films of raw milk.

Staining Films of Reconstituted Non-fat Dry Milk

The aniline oil staining solution must be compounded very carefully to avoid precipitation of dye during storage. Stain showing a considerable separation of dye has poor staining qualities and should be discarded. The staining time (about one-half minute) required to produce the best contrast may be determined by the use of smears of reconstituted powders of predetermined count. The aniline oil stain characteristically stains non-fat milk films with poor uniformity. Nevertheless, under ideal conditions experienced technicians have found it to be very effective in staining heat killed bacteria in non-fat dry milk films.

The Levowitz and Weber Stain is very volatile and must be kept in a tightly sealed container during storage and preferably while being used. Stain left in an open staining dish becomes unusable very rapidly. An eight ounce wide mouth jar with plastic screw cap and liner is satisfactory for staining 1″ x 3″ or 2″ x 2″ slides. The L-W stain has the advantage of being simpler to use under field conditions. Experience in industry laboratories has been in favor of the L-W stain in staining heat killed bacteria. It is important to follow the procedure for drying the slides rapidly after staining[1] and washing the stained slides in warm water as described by Levowitz and Weber (*1*).

The accurate counting of non-fat dry milk films requires much more time than counting raw milk films. The heat killed bacteria usually stain less intensely. Therefore, the films must be examained more critically with continuous focusing up and down through the film. Often the bacterial cells have to be in very sharp focus in order to be visible. Raw milk films, on the other hand, with more intensely stained bacteria will often be visible even when not in sharp focus. A microscope with a flat field having the entire area of the field in focus at one time is very desirable for this work. However, this effect can be obtained with other microscopes by using an ocular disc with an inscribed circle. Only the bacterial clumps within the circle should be counted. It is necessary to count more fields with this procedure, but the advantage of having the bacteria in sharper focus makes the use of the ocular disc worthwhile. Also, the quadrants provide guide lines which aid in counting high-count samples.

The prevention of eye fatigue is very important in the examination of non-fat dry milk films. Glare may be reduced and excellent resolving power obtained by using Kohler illumination as described by Richards (2). Focusing type research lamps or specially designed built-in base illuminators may be used for this purpose. Binocular microscopes are less fatiguing than monocular types. Also, it is more restful to have the position of the microscope adjusted to the eye level of the seated microscopist. Powder samples of known direct microscopic counts (as determined by the official laboratory for instance) can be used to determine the efficiency of the microscope and illumination as well as the staining procedures.

Powder samples of known direct microscopic counts (as determined by the official laboratory for instance) can be used to determine the efficiency of this micro-

[1]A small fan such as the TV tube cooling fan sold by Allied Radio Corp., Chicago 80, Illinois, is effective in drying stained slides rapidly.

scope and illumination as well as the staining procedures. Powder samples having large numbers of faintly staining dead bacteria are particularly helpful in this regard. Such samples may be used to check stains that have been used and refiltered.

Studies have been conducted or are being conducted by the American Dry Milk Institute, the University of Minnesota, and the U.S.D.A. Laboratory in Chicago. These studies are being made in an attempt to determine the relative effectiveness of the two staining procedures and to determine the degree of variability between laboratories. The publication of these results is awaited with interest.

Comparison of the L-W Stain with the Acid and Water Free (AWF) Stain Applied to Raw Milk Samples

A preliminary trial of 112 samples of raw milk from Grade "A" farms showed somewhat higher counts when stained with the L-W stain. The L-W stain stained the bacteria more intensely and produced better contrast with the background than the AWF stain. The L-W films had the disadvantage, however, of showing more precipitated dye then the AWF stain. This did not appear to be a serious handicap, however.

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TEST PROCEDURES FOR EVALUATING BACTERICIDAL COMPOUNDS

This section was prepared by Dr. W. S. Mueller, *Chairman* of the subcommittee for this subject.

Two test procedures for evaluating bactericidal agents have been developed and used for some time in the University of Massachusetts dairy research laboratory. The macro test is described briefly in *Soap and Sanitary Chemicals*, September, 1947, and the mirco test is described in *Modern Sanitation*, June 1950.

The present report deals chiefly with modifications which have been made on the two methods since their publication. The macro method may be used to determine bactericidal kill from zero to 99.9999 per cent, inclusive; the micro method is suitable for determining 100 per cent kill and also for rapid screening tests.

The chief advantage for the Massachusetts methods is that they are less laborious than the Weber and Black test and the Chambers modification of the Weber and Black test, without sacrificing accuracy. In the Massachusetts methods the mixing of test organisms and test solution by swirling test tubes or flasks is eliminated by the use of a magnetic stirrer submerged in a temperature bath. Also, in the Massachusetts macro method the test organism is added with a syringe in a fixed position which assures greater uniformity for each test. When the micro test is used as a rapid screening test, transfers of inoculated test solution at the end of the contact period are made with a wire loop to broth, similar to transfers used in the phenol coefficient test. However, a major limitation of the phenol coefficient test, namely the frequent occurrence of skips and false positives, has practically been eliminated in the Massachusetts method by the use of newer techniques.

TEST PROCEDURES USED BY HEALTH DEPARTMENTS FOR THE EVALUATION OF GASKETS AND FITTINGS IN C. I. P. INSTALLATIONS

This report consists of a summary of information obtained by a letter survey conducted by the subcommittee consisting of F. W. Barber, *Chairman*, and H. H. Weiser.

The increased use of bulk tanks on the dairy farm and C.I.P. installations in the dairy plant has indicated the need for greater uniformity in procedures for the evaluation of the sanitary condition of lines and equipment cleaned in place. Although the 1953 Milk Ordinance and Code of the United States Public Health Service recommends procedures and standards for C.I.P. *lines* there are no uniform procedures or standards given for the evaluation of *gaskets* and *fittings* in C.I.P. installations. The literature was reviewed and discussions held with various individuals concerned with the evaluation of C.I.P. installations. Numerous methods for the bacteriological examination of gaskets and fittings were reported but no one suggested possible bacterial standards for these items.

In order to determine what action is being taken by regulatory officials on the subject of the evaluation of gaskets and fittings in C.I.P. installations this letter survey of various health departments was undertaken. A questionnaire was prepared which listed several methods for the evaluation of gaskets and fittings and also included a section on evaluation of C.I.P. lines. The questionnaire and a letter explaining the survey were sent to officials of the Departments of Health of the 48 states, Hawaii, Alaska, the District of Columbia, Puerto Rico and the Virgin Islands and to fifteen state universities. Replies were received from 34 health departments and nine universities.

Briefly summarized, the survey indicated that about 80% of the states reporting relied upon visual examination or a combination of visual examination and swab tests, rinse tests or product counts for the evaluation of gaskets, fittings and pipelines in C.I.P. installations. However, only 30% of the replies indicated any standards for gaskets or fittings and 50% gave standards for C.I.P. lines. The bacterial standards reported for gaskets, fittings and lines were those recommended in the Milk Ordinance and Code (1953) for pipelines cleaned in place, namely, 100 per 8 sq. in. or 2 per sq. cm. Eleven states in reporting made specific reference to the Milk Ordinance and Code.

For the examination of gaskets, six states reported a swab test on the surface of the gasket exposed to the product; three states reported a swab test on all gasket surfaces; and one state reported a rinse test on the entire gasket. For the examination of fittings, nine states reported using swab tests on surfaces expoesd to the product (swabbing of 1-2 inches of the inner pipe surface at joints) and two states reported using swab tests on joining surfaces.

The replies from the nine universities substantiated those from the states in which the universities are located. The importance of proper installation, proper cleaning and sanitization and visual inspection were stressed by several reports. Product counts apparently are used in the evaluation of some university farm installations. The bacterial standard of 100 per 8 sq. in. or 2 per sq. cm. was considered as lenient.

It would appear from the survey, literature review and discussions with those concerned with the evaluation of C.I.P. installations that more information is needed concerning the best method for evaluation and possible realistic bacterial standards for gaskets and fittings. Experience is indicating that the most satisfactory methods for the evaluation of C.I.P. installations are a combination of visual inspection, the pressure cotton swab technique of Holland *et al.* (Food Eng. May 1953), rinse tests of the entire gasket, and swab tests on the inner pipe surfaces at the joints. At present sufficient data is not available to even suggest suitable bacterial standards.

COMPARISON OF THE "MALLMANN" SURFACE PLATING TECHNIC WITH THE STANDARD PLATE COUNT

This subcommittee consisting of J. J. Jezeski, *Chairman,* W. C. Lawton, W. E. Glenn, H. B. Richie, and W. B. Moseley, compared the "Mallmann" surface plating procedure with the standard plate count utilizing results obtained in two different laboratories from raw, laboratory pasteurized, and commercially pasteurized milk samples. One laboratory reported results using this procedure for examining ground meat samples. The Mallmann procedure consists of placing a suitable dilution of a sample on the surface of a previously poured and dried nutrient agar plate and incubating the plate in the usual manner. Standard plating procedures where applicable and the Mallmann technic were followed closely. In testing the meat samples, the entire surface of the agar plate was inoculated by smearing the drop over the surface with a previously sterilized bent glass rod.

In attempting to determine which of the two methods gave a significantly higher count in these comparisons, it was found that averages of certain groups of samples had very little significance because of large variations between the populations of samples tested. Therefore, it appeared that a comparison of the two methods on individual samples as to which one resulted in a signficantly higher count or whether the two methods produced essentially equivalent results was a logical approach. In determining which method produced the higher count, therefore, or whether the two methods were equivalent in a paired comparison of a single sample, it was decided that if the lower count observed (by either method) was 80% or more of the higher count, the two methods would be considered to give equal results. If the lower count was less than 80% of the higher count, then the method giving the higher count was considered to be significantly better. In other words, there was considered to be no difference between the two methods unless the lower one was less than the higher by more than 20% of the higher count.

Laboratory No. 1 examined 35 samples of raw milk. The standard plate count for 20 of these was significantly higher, while the drop plate count was significantly higher in 5 samples. Fifty-nine samples of laboratory pasteurized milk examined and for 23 of these the drop plate results were significantly higher, while the standard plate count was significantly higher in only 11 samples. Of 48 samples of retailed bottle milk, 14 were higher by the drop plate and 10 were higher by the standard plate count.

Laboratory No. 2 ran 48 samples of raw milk. The standard plate count was significantly higher for 32 of these while the drop plate was significantly higher for 5 sample. Of 26 samples of laboratory pasteurized milk, 11 were higher by the standard plate count, while 7 were higher by the drop plate method. Of 28 samples of retailed bottled milk, 17 were higher

by the standard plate count, and 6 were higher by the drop plate method.

Laboratory No. 3 ran 16 samples of ground meat using 8 samples which had no cure added and 8 samples which had a cure added. Six samples which had no cure added were higher by the standard plate count and 2 gave the same result by either method. Two samples with the cure added were higher by the standard plate count while one sample was higher by the surface plate method.

It is evident from the above minimum number of experiments that the standard plate count yeilded higher count for raw milk samples than did the drop plate method. This was true for both laboratories, each of which was situated in a different section of the country. The reason for this difference was not determined but a logical explanation maybe that it was due to the presence of the surface active agent in the drop plate dilution water which might serve to inhibit certain types of bacteria. The difference in counts, and difficulty with spreader types noted in both laboratories indicated that the drop plate method may be unsuitable for use on raw milk supplies. It would seem, however, that there is greater possibility of using the drop plate method on Laboratory pasteurized samples as evidenced by the better agreement obtained in both laboratories for these samples.

For retail bottled samples, the results from laboratory No. 1 indicated that the drop plate method and the standard plate count were equally satisfactory. However, the results from laboratory No. 2 were in agreement with this indication. There was no apparent reason for the disagreement between the laboratories.

It is evident that further investigation is necessary before the Mallmann surface plating technic can be accepted as an official or provisional method for the bacteriological examination of milk supplies.

A COMPARISON OF OTHER PROPOSED PLATING TECHNICS WITH THE STANDARD PLATE COUNT

This subcommittee consisting of J. C. McCaffrey, *Chairman*, and C. K. Johns, made a limited comparison between the Astell Toll Tube technic and the standard plate count, and the Bacto Strip technic and the standard plate count.

The Bacto or paper-strip process developed by Forg in 1955 has received wide acceptance in European countries but is still somewhat of a curiosity on our continent. The basic principle of this process is the use of a dry paper strip which has been impregnated with a specific medium, sterilized, and kept in a sterile plastic envelope. The paper strips are so standardized that when inserted into a container of milk they will absorb a certain definite quantity of fluid. The inoculated strips are incubated for either 8 to 10 hours or 12 to 15 hours, depending upon the type of medium used.

Twenty-nine samples of bottled pasteurized milks were examined for the presence of coliform organisms using the standard violet red bile agar procedure and paper strips impregnated with violet red bile broth. Seven of these samples showed higher coliform results with the paper strip method while 6 showed higher results with the standard violet red bile agar plate method. The remaining 16 samples showed identical results.

While it is realized that 29 samples do not constitute a satisfactory criterion for determining the suitability of a method, the results indicated that the paper strip method compares favorably with the accepted standard pocedures. It has several advantages in that pipettes, Petri dishes, and other glassware are eliminated. The paper strips, protected from light, can be carried in the inspector's pocket and can be used to conduct ambulant tests in dairy plants. An apparent disadvantage is the incubation time, which in many instances does not fit in with the normal laboratory routine.

The Astell Roll Tube Technic, which originated in England and has been widely used on the European continent for many years, but has, up to the present time, received very little acceptance in this country, was applied to 58 pasteurized fluid milk and cream products along with the standard plate count procedure. The Astell Roll Tube Technic consists of adding 0.5 ml. of the liquid to be tested to a small bottle containing 4.5 ml. of melted agar. The bottle is placed on a spinning apparatus which allows a spray of water to impinge on the surface of the bottle as it spins. The agar solidifies in an exceedingly thin film over the internal surface of the bottle. The bottles are incubated for 48 hours in an upright position and the resultant colonies are counted on a special type of a colony counter.

To determine which of two methods yielded the higher count it was decided that if the lower count observed (by either method) was 80% or more of the higher count, then the two methods would be con-

sidered to give equivalent results. If the lower count, on the other hand, was less than 80% of the higher count, then the method giving the higher count was considered to be significantly better. In other words, there was considered to be no difference between the methods unless the lower one was less than the higher by more than 20% of the higher count.

Twenty-seven samples of pasteurized "cream-top" Grade A milk were examined. The standard plate count for 6 of these samples were significantly higher than the roll tube count, while the Astell Roll Tube count was significantly higher for only 1 sample. Counts were identical for 20 samples.

Sixteen samples of pasteurized homogenized milk were examined. Four of these yielded standard plate counts higher than the roll tube counts and 12 gave the same count by both methods. Eight samples of pasteurized coffee cream were examined. Two of these gave standard plate counts higher than tube counts, and 6 gave the same count by both methods. Of seven samples of pasteurized half and half, 1 yielded a standard plate count higher than the roll tube count, while 6 samples gave the same count by both methods.

In view of the fact that 44 of the 58 samples examined yielded identical results by both methods, it would seem that the Astell Roll Tube technic is worthy of further consideration by this committee since several advantages over the standard plate count have been claimed for it. The Roll Tube Method is said to be much more economical since it is claimed that laboratory and media costs are reduced and that less incubator space is needed. Also, the risk of contamination should be materially reduced.

For the next year the Applied Laboratory Methods Committee plans to carry out additional laboratory research on the Astell Roll Tube Technique and the Bacto Strip process as well as other problems suggested by members of the Association.

J. C. McCaffrey, Chairman, Illinois Association
F. W. Barber, New York State Association
B. M. Barney, Memphis, Tenn.
R. N. Costilow, Michigan Association
W. E. Glenn, Tri-City Milk and Food Sanitarians, Louisville, Kentucky
J. J. Jezeski, Minnesota Association
C. K. Johns, New York State Association
W. C. Lawton, Minnesota Association
E. W. McFarren, New York State Association
W. K. Moseley, Indiana Association
W. S. Mueller, Rhode Island Association
R. B. Parker, California Association
H. B. Richie, Illinois Association
G. W. Shadwick, Illinois Association
D. I. Thompson, Wisconsin Association of Milk and Food Sanitarians
H. H. Weiser, Ohio Association

NEWS AND EVENTS

ANNOUNCEMENT

A course in Epidemiology and Control of Food Borne Disease will be offered at the Communicable Diseae Center, Public Health Service, Atlanta, Georgia, May 19-23, 1958.

Designed to provide public health workers with current information on prevention and control of food borne disease, the course is offered for physicians, veterinarians, laboratory workers and enivronmental health personnel and others who work in the general field of food control. Preference will be given to persons whose professional duties involve the application of epidemiological technique in the field. Information and application forms may be obtained from, Chief, Communicable Disease Center, 50 7th St., N. E. Atlanta 23, Georgia.

ANNOUNCEMENT

The Seventh Southern Municipal and Industrial Waste Conference will be held at Duke University, Durham, N.C., on May 1 and 2. The course is under the auspices of the College of Engineering. The general theme of the Conference will be, responsibilities and challenges in the field of sanitary waste control. Persons interested in obtaining more detailed information should correspond with Professor J. W. Williams of the Duke University College of Engineering.

IDAHO ASSOCIATION APPOINTS 3-A STANDARDS LAISON COMMITTEE

The Idaho Association of Sanitarians, at their annual meeting, held on March 6, 1958, appointed a committee to cooperate with the Committee on Sanitary Procedure of this Association and in turn give laison assistance to the 3-A Sanitary Standards Committee.

The purpose of the Idaho committee is threefold. First, to present material, pose questions and call attention to any irregularities encountered which may not be in accord with established 3-A Standards. Secondly, to report to the membership of the Idaho Association, recommendations, actions and procedures resulting from actions taken by the parent 3-A group, and, third, to cooperate in the promotion of 3-A standards in Idaho and assist in acquainting industry with the advantages of using equipment which meets construction and sanitary requirements as promulgated and publihed by the parent 3-A Committee.

President Jack Jelke then appointed a 3-A Standards committee consisting of the following Idaho members: Keith Harvey, chairman, Ken Poole and Rulon Tueller.

ARTHUR S. DICK, JR., PASSES AWAY

Arthur S. Dick, Jr., of Evansville, Indiana died March 22, following surgery. Mr. Dick was supervisor of the food control section of the Vanderburgh- Evansville Department of Public Health. He had been associated with the Evansville Department for some ten years and had served as supervisor of food control during the past four years. He was well known among the members of the Indiana Association and took an active part in its affairs. Both the Indiana Association and International have lost a staunch friend and active member, and it is with regret that his death is reported.

CLARENCE J. BABCOCK DIES

Clarence J. Babcock, long time leader in milk marketing, died in Washington, D.C. on February 25. Mr. Babcock, at the time of his death was Director of the Foreign Agricultural Service's Dairy and Poultry Division, U.S. Department of Agriculture. He joined the Department in 1917 serving continuously until the time of his death. A native of Medina County, Ohio, he graduated from Ohio State University in 1916 with a B.S. degree in agriculture. During World War II he was commissioned as a Lieutenant Colonel in the U.S. Army Sanitary Corp and was in charge of milk supply sanitation.

Mr. Babcock was a member of the American Dairy Science Association, the International Association of Milk and Food Sanitarians, and the Dairy Technology Society of Washington, D.C., and Maryland. As a member of International he served a number of years on the Association's Committee on Ordinances and Regulations. "C. J." was well know and respected by his fellow members of our Association and it is with deep regret that we note his passing.

LACK OF ADEQUATE DIET CALLED NATIONAL HEALTH PROBLEM

Speakers at the National Food Conference held recently in New York stated that food fads, freak diets and a lack of knowledge of good nutrition are creating one of the nation's major health problems. Charles B. Shuman, president of the American Farm Bureau Federation stated that, "The fact that the United States is the best fed nation in the world should not blind us to well supported evidence that hundreds of thousands of Americans are failing to eat balanced, nutritious meals." He reported that 29 percent of American household are not obtaining the amount of calcium recommended by the National Research Council; 25 percent do not get enough vitamin C and 19 percent not enough riboflavin.

Leaders in education, industry, nutrition, medicine, labor, family living and from other fields attending the conference reviewed research findings about the nation's eating habits to discuss means of focusing public attention on defeciencies and to devise ways of improving nutritional habits.

While the press does a good job of reporting the wealth of information developed through colleges, universities, research foundations and the food industry, there is still an urgent need for a continuing drive to get the facts about food and the importance of good nutrition to the attention of the nation's families.

The Conference was sponsored by the major food industries and farm groups as a public service.

AMERICAN DAIRY ASSOCIATION ANNOUNCES THREE NEW RESEARCH PROJECTS

Three new research projects — two to study feed flavor in milk and one to study the effect of moderate and low-fat weight control diets on persons between the ages of 40 and 60 — are getting under way through sponsorship of the American Dairy Association.

One of the milk-flavor studies will test the effectiveness of vacuum processing for eliminating weed and feed flavors from milk. It is being conducted by A. W. Rudnick, Jr., and T. R. Freeman at the University of Kentucky.

The other milk-flavor study will examine the chemical and physical properties of compounds responsible for feed flavors in milk, in an effort to find a means to eliminate these flavors. It is being conducted by Dr. W. M. Robert of the University of North Carolina.

The low-fat diet study, being carried out by Dr. Robert E. Olson at the University of Pittsburgh, is part of a larger project on weight control diet and the association also voted to continue twelve other projects on cholesterol levels when dairy products make up a significant part of the diet.

All of the new projects were adopted by the American Dairy Association at its recent Executive Committee meeting in Tulsa. At the same meeting, the association also voted to continue twelve other product and nutrition research projects. These cover a wide range of nutritive studies, including several on the relationship of fats to heart disease. Four of the twelve renewed projects ar being administered by the National Dairy Council.

PYROCERAM — NEW DEVELOPMENT IN GLASS LIKE MATERIAL

The Corning Glass Works has reported the development of a versatile new substance, Pyroceram, that is harder than steel and lighter than aluminum. The first practical use of Pyoceram will be in radomes, the nose cones that protect the directional instruments in guided missiles.

Pyroceram starts out as glass and is melted and fashioned in the same way. But each batch of raw material includes chemical ingredients that contain a nucleating agent, which, under heat treatment, forms crystals. Glass is noncrystalline, whereas, Pyroceram is crystalline.

The new material can be cast like metal in a foundry, thus allowing the fabrication of large and complex shapes. The substance is extremely hard and fine grained. It can be made transparent or opaque and, by controlling the chemical composition and growth of the Pyroceram crystals, material of widely differing properties can be produced. Pyroceram was invented and developed by S. Donald Stookey, manager of Corning's chemical research department.

APHA RECEIVES FINANCIAL GRANT FROM FOUNDATIONS

Grants of $150,00 each have been made to the American Public Health Association by the Rockefeller Foundation and the W. K. Kellogg Foundation. The announcement was made by Dr. Berwyn F. Mattison, executive secretary of the Association. The grants will aid the Association to step up its technical assistance services to health agencies and also its program of applied research in public health methods. APHA plans a $750,000, three year expansion program, and, with the two grants, half the needed sum has been raised.

AUTHORIZATION TO USE THE 3-A SYMBOL

Following is a list of concerns to which 3-A Symbol Council authorizations to use the 3-A symbol have been issued since publication of the list in the February 1958 number of the Journal. Those identified thus (*) are recipients of newly-issued authorizations. The other concerns listed have had their authorization certificates amended because of change of firm name, change of address, or addition of model numbers.

This list supplements other listings published in earlier issues of the Journal.

AUTHORIZATION NUMBER	CONCERN AND ADDRESS	MODEL NUMBER
	FITTINGS-SANITARY	
89	*Universal Machining Co., Inc. 6615-28th Avenue Kenosha, Wis.	63-GT-1½ 63-FT-1½
	HEAT EXCHANGERS — PLATE TYPE	
14	Chester-Jensen Co., Inc. 5th and Tilghman Sts., Chester, Pa. Transferred from: York Division — Borg Warner Corporation York, Pa.	No change in model numbers
	TANKS, FARM HOLDING AND/OR COOLING	
94	*Esco Cabinet Company West Chester, Pa.	BW: 150, 200, 240, 300, 350, 425, 475, 500, 650, 800, 1000
55	Haverly Equipment Div. — John Wood Co., First Street Royersford, Pa. Address changed from: 208 South Geddes St., Syracuse 4, N.Y.	No change in model numbers
57	The Pfaudler Co. — A Division of Pfaudler Permutit, Inc. 1000 West Avenue, Rochester 3, N.Y. Title changed from: The Pfaudler Co.	Model numbers: J DS: 15, 18, and 20 discontinued. DS: 25, 180, 250, and 400 added.
	TANKS, AUTOMOTIVE TRANSPORT OR PICK-UP	
93	*Pennsylvania Furnace and Iron Co. 316 Pine Street, Warren, Pa. *Errata* — L. C. Thomsen Sons, Inc., should have been No. 73 rather than 78 Damrow Brothers Co., No. 76 was for storage tanks, not automotive transport tanks	List of model numbers on file.

These corrections should be made to list published on pages 55 and 56, February 1958 issue of Journal.

dairyman's best friend... LO-BAX

CHLORINE BACTERICIDES

Bigger profits depend on high-quality milk, and both depend on Lo-Bax, the dairyman's best friend. Public Health authorities everywhere have long recognized that a chlorine bactericide like Lo-Bax provides dependable, fast, efficient bactericidal action so necessary to meet the vital needs of the dairy plant operator.

Lo-Bax is dry, granular and free-flowing, rinses quickly and freely, and imparts no color, taste or odor to milk. It is available in two forms—Lo-Bax Special and LoBax-W (with a wetting agent). And, for added convenience, a handy measuring spoon is included in each bottle.

Dairy plant operators know they can rely on Lo-Bax to provide positive protection in all phases of milk production. They use it in their plants—and recommend it to their suppliers—and find they get higher quality milk and bigger milk profits. Write today for complete information and samples.

Lo-Bax® is a trademark

OLIN MATHIESON CHEMICAL CORPORATION
LO-BAX

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OLIN MATHIESON CHEMICAL CORPORATION
INDUSTRIAL CHEMICALS DIVISION • BALTIMORE 3, MD.

he trusts...

HEIL-DELIVERED MILK

Chances are Heil helped deliver this child's milk ... because more milk is delivered in Heil tanks than all others combined.

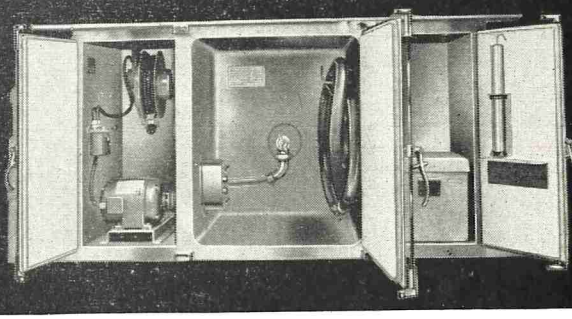
You can count on the milk being fresh and pure. For more than 25 years, Heil has led the way in sanitary design of milk transport tanks. Heil "firsts" include —

- removable snap-on door gaskets for easier cleaning
- 3-compartment cabinet for sanitation by isolation
- FRIGID-LITE* plastic tanks, newest and most advanced design in the industry

Other improved features for better sanitation include a wall-mounted pump to simplify cleaning of compartment floor, clamp-type valve that's easy to remove for daily cleaning, and single gasket and locking device to seal the manhole and dust cover.

Heil takes pride in doing its part to help sanitarians keep milk pure all the way to the consumer.

Sanitary 3-compartment cabinet is handy to use and keep clean. Plastic doors are hermetically sealed providing superior insulating efficiency, have snap-on gaskets, are warp-proof and dust-tight.

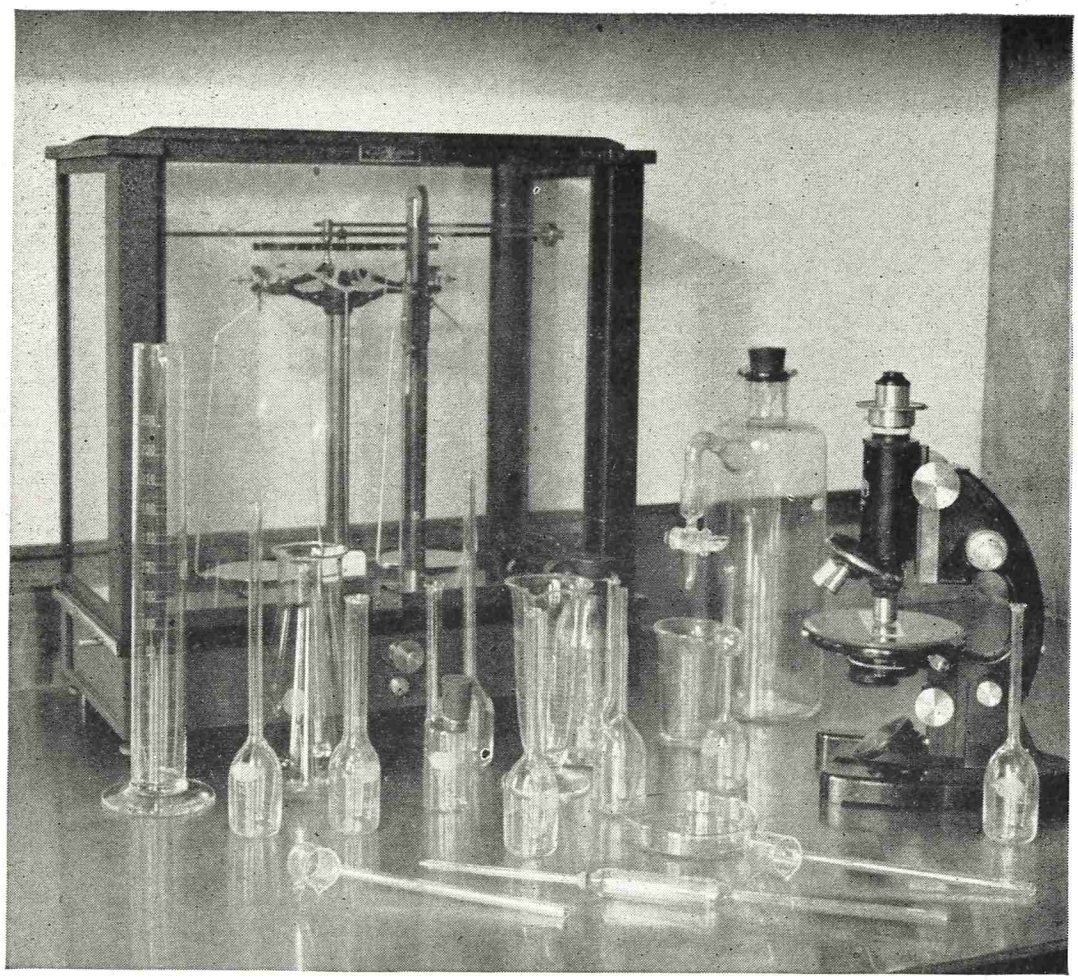


THE HEIL CO.

3000 W. Montana St., Milwaukee 1, Wisconsin
Factories: Milwaukee, Wis., Hillside, N. J., Lancaster, Pa.

Heil products for the dairy industry include pick-up and transport tanks of stainless steel and FRIGID-LITE* plastic, cylindrical and rectangular milk storage and cooling tanks.

*Registered trademark



Everything but the scientist . . .

The surest way to get whatever you need in durable, precision-made glassware is to contact your local Cherry-Burrell Representative. He's in a position to deliver—and promptly—the laboratory supply items you require.

Why not give him a call? And, while you have him on the phone, keep in mind that you save when you buy in carton quantities . . . or maintain a standing order to fill your routine replacement needs.

CHERRY-BURRELL
CORPORATION

427 W. Randolph Street, Chicago 6, Ill.

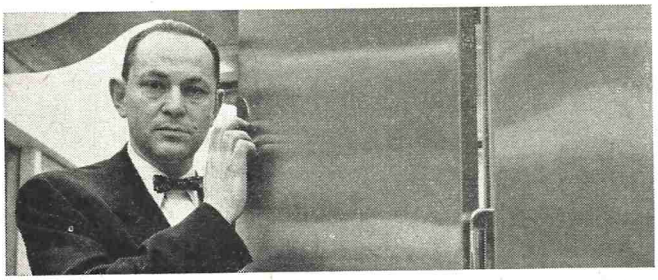
SALES AND SERVICE IN 58 CITIES — U. S. AND CANADA

Dairy • Food • Farm • Beverage • Brewing • Chemical • Equipment and Supplies

Leading sanitary consultant reports on bulk milk dispensing

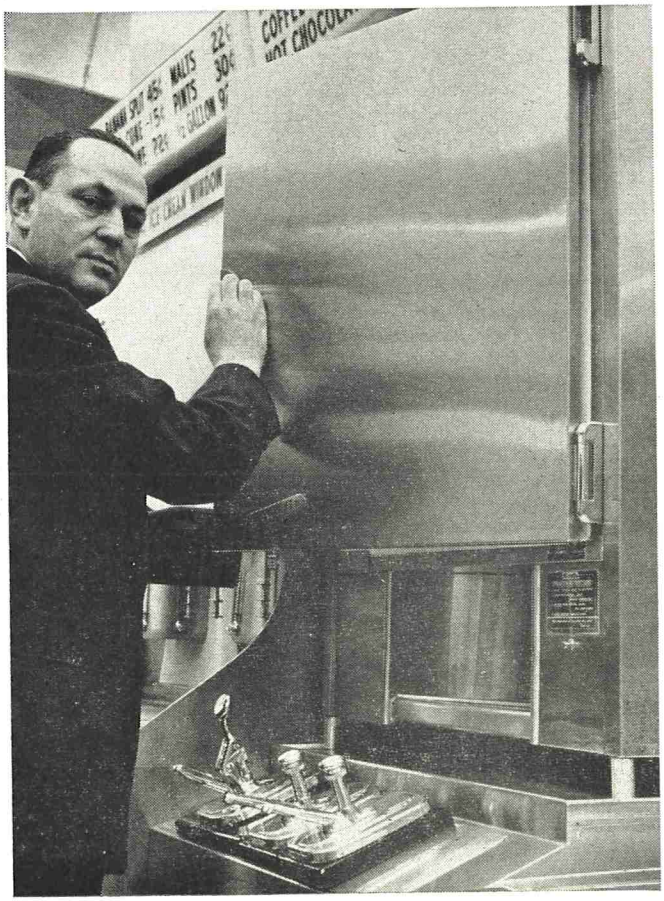
Harold Wainess knows milk. With a Master's degree in Dairy Bacteriology, he is a former dairy plant manager. After many years as Regional Milk and Food Consultant with the U. S. Public Health Service, he later served as Chief Sanitary Officer of Chicago. Now, with 16 years' experience in the field, he has his own consulting firm. He loves to talk business. He predicts . . .

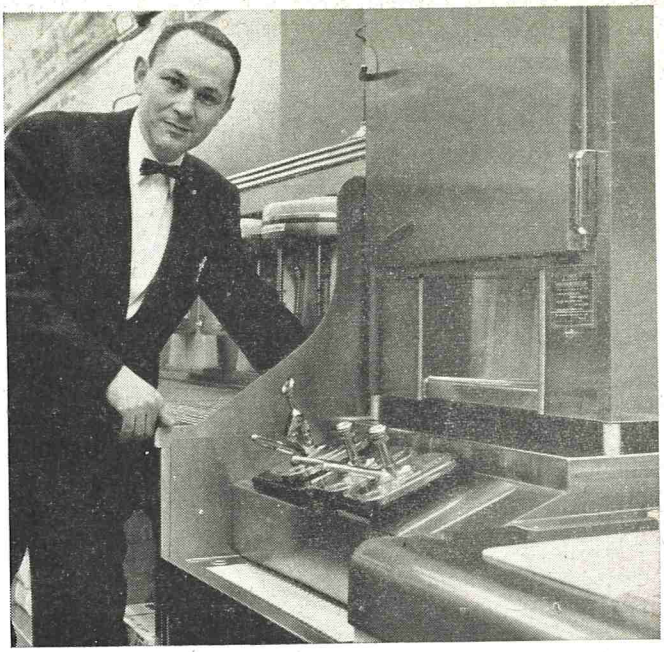
"Through the dissemination of proper advice and information by sanitarians, Public Health



Officials, and the customer's own resistance to insanitary methods, there is coming a change over to Stainless Steel in bulk milk dispensing.

"The reasons are that with Stainless Steel there is an ever-present incentive to keep it clean and, furthermore, it is *easy* to clean. The hard, smooth finish resists corrosion from food acids.





"You'll see Stainless Steel bulk milk dispensers become more and more popular in eating places, because the simple fact is that these places *sell more milk* when they use the dispensers. One sur-

vey of more than 200 restaurants using Stainless dispensers revealed an average increase in milk sales of 51%.

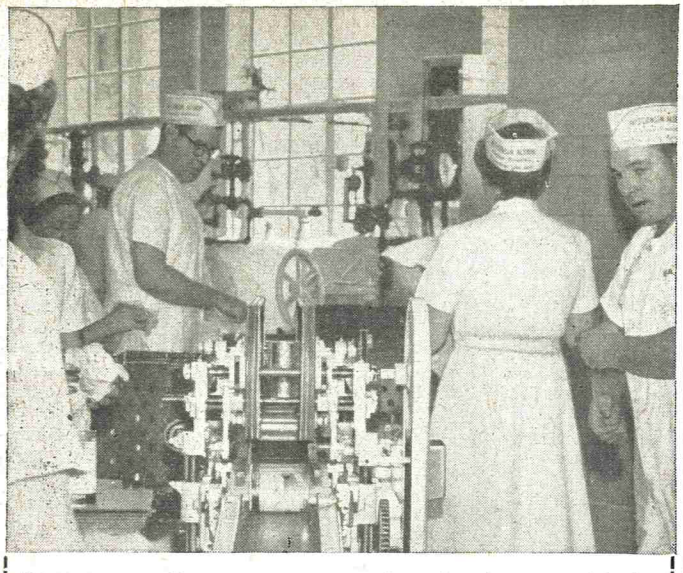
"In the long run, the bulk system is less expensive. It makes for easier handling, faster service, less spillage, and better sanitation. The initial price of Stainless Steel is a little higher, but due to the lasting qualities of this durable metal, the actual cost may prove to be less when distributed over the expected years of useful sanitary life."

If you would like to have more information about Stainless Steel and the bulk milk dispensing system, write United States Steel, 525 William Penn Place, Pittsburgh 30, Pa.

USS TRADEMARK

United States Steel Corporation—Pittsburgh
American Steel & Wire—Cleveland
National Tube—Pittsburgh
Columbia-Geneva Steel—San Francisco
Tennessee Coal & Iron—Fairfield, Alabama
United States Steel Supply—Warehouse Distributors
United States Steel Export Company

United States Steel



To ensure a quality concentrate, every piece of equipment used in the canning line is made of stainless steel. And complete sterilization is maintained from the start and until the concentrate is sealed in the sanitary open-top type of container.

Sanitarians Know These 8 Facts!

1. Pure milk demands pure vitamin additives, and Vitex vitamin concentrates are the highest in quality!
2. It is fundamental that in the modification of milk (or in the addition of any modifiers to milk) only ingredients having the same sanitary quality be used.
3. The dairy ingredients in Vitex vitamin D milk concentrates are derived only from Grade A milk.
4. The dairy ingredients used in Vitex vitamin D concentrates are processed only in Grade A dairy plants.
5. Each lot of dairy ingredients used in Vitex vitamin D concentrates is evaluated for sanitary quality by stringent methods of bacteriological procedures.
6. Vitex vitamin milk concentrates are processed in a modern, regularly inspected plant designed especially for the product. It is given regular multiple sanitary inspection.
7. Equipment used in processing Vitex vitamin D milk concentrates complies with the 3A Sanitary Standards for dairy equipment.
8. Vitex vitamin milk concentrates represent the highest of standards in dairy products processing techniques. They are used in America's outstanding and finest dairies.

VITEX LABORATORIES

NOPCO — A Division of NOPCO CHEMICAL COMPANY
Harrison, N.J. • Richmond, Calif.

Pioneer Producers of a Complete Line of Vitamin Concentrates for the Dairy Industry

SHOO-BAC

A SPECIAL FORMULATION FOR INSPECTORS AND FIELDMAN WHO MUST TRAVEL BETWEEN DAIRY FARMS AFTER HAVING VISITED THE BARNS, PARLORS, AND LOAFING AREAS OF EACH.

Have you ever thought or been asked about the possibility of conveying contagion? Ever noticed show sensitive many dairymen are about cattle traders on premises?

May also be used on thermometer stems, sample dippers, etc.

SHOO-BAC contains Quaternary

Ammonium compound	.1%
U.S.P. alcohol	55.0%
Propellant	44.9%

Quaternary for residual effect.
Alcohol for drying.

Available from BACTI-KIT CO., INC.
Box 101
Eugene, Oregon

Minimum order 6 cans, 12 ounces each $5.40

F. O. B. Eugene, Oregon

IODINE SANITIZERS

OFFER ALL THESE ADVANTAGES

A LONG RECORD OF DEPENDABILITY. Iodine is recognized as a most efficient antiseptic and germicide. It is known to be effective against a wide range of organisms.

SPECIALIZED PRODUCTS. Iodine sanitizers and detergent-sanitizers are offered by leading manufacturers for treatment of milk, food and beverage utensils and equipment. Also available are iodine disinfectant-cleaners for hospitals, schools, institutions, food and beverage plants, and industrial applications.

EFFECTIVE. Iodine preparations are effective in low concentrations . . . economical, too. Their use can contribute to improved public health.

EASY TO TEST. The well-known iodine color is an indication of solution strength. When the color of an iodine sanitizing solution begins to disappear, that is a signal to replenish or replace the solution. There is no reason **ever** to let an iodine solution get too weak to be effective. Test kits are available.

Write us for further information, and names of manufacturers offering iodine sanitizers and disinfectant-cleaners in your area. No obligation, of course.

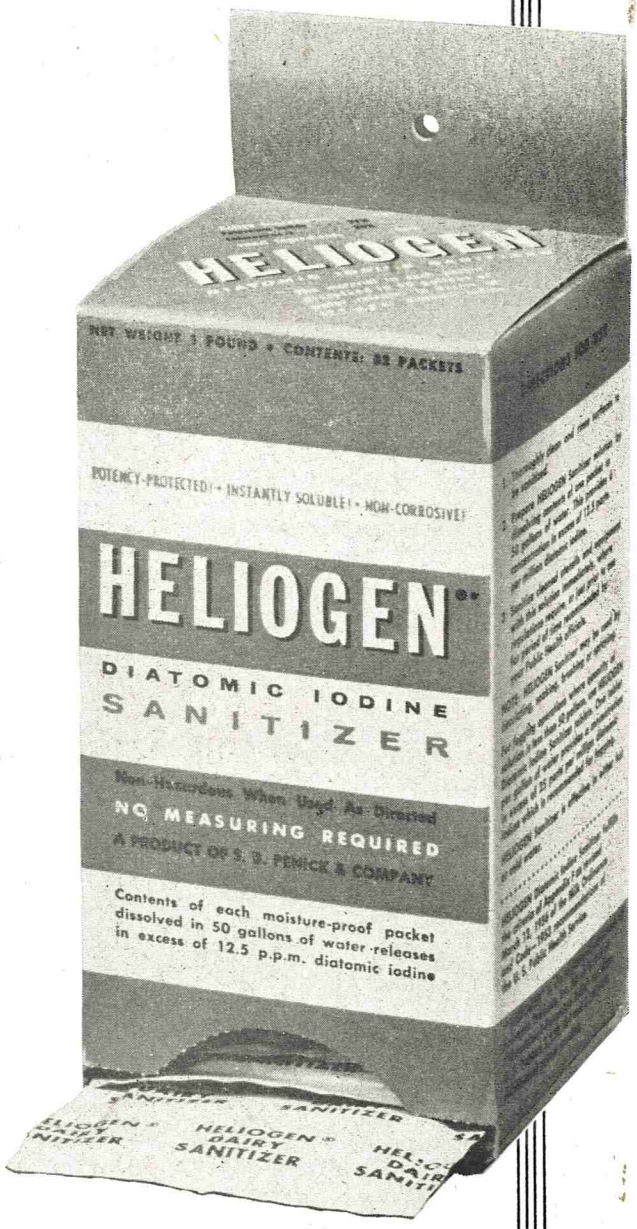
CHILEAN IODINE EDUCATIONAL BUREAU, INC.

This 6" x 3" x 3½" Carton Contains 1600 Gallons of HELIOGEN(R)

DIATOMIC

IODINE

SANITIZER



This handy dispenser contains 32 half-ounce packets of HELIOGEN Diatomic Iodine Sanitizer.

Each sealed packet makes 50 gallons of sanitizing solution containing over 12.5 p.p.m. diatomic iodine . . . more than is needed to fulfill the criteria of Appendix F of the Milk Ordinance and Code, revised March 12, 1956.

Developed by S. B. Penick & Company, HELIOGEN takes much of the work and all the guess-work out of sanitizing, substantially reducing time and labor.

The clear solution leaves no odor, taste or film on utensils and equipment. It can be used with equal effectiveness by circulating, soaking, brushing or spraying. Visual color checks assure effectiveness.

SAFE . . . NON-CORROSIVE

HELIOGEN won't corrode utensils and equipment. Doesn't chap and dry operators' hands.

ALSO IN TABLET FORM

Hermetically sealed in foil, *effervescent* HELIOGEN tablets release more than adequate dosage (1 tablet per 10 quart pail) for use on dairy farms.

AVAILABLE FROM

Cherry-Burrell Corporation • Kennedy & Parsons Co.
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PENICK

Sanitizing Products Division

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CURRENT STATUS OF 3-A SYMBOL UTILIZATION

C. A. Abele

The Diversey Corporation, Chicago, Illinois

The composition and organization of the 3-A Sanitary Standards Symbol Administrative Council have been described in such detail in the 1955 and 1956 Annual Reports of the Committee on Sanitary Procedure, that it may be assumed that those who hear or read this 1957 Report are already acquainted with the nature and functions of the Council.

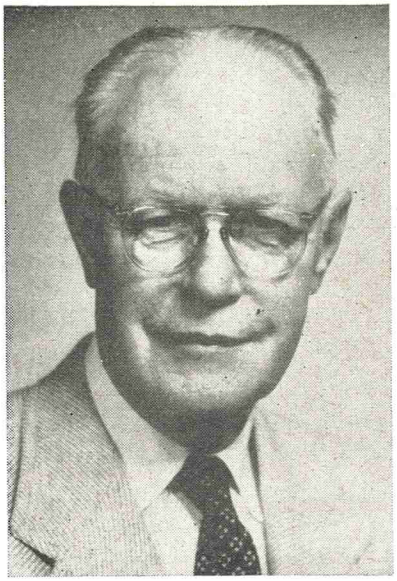
Within a few weeks of the 1956 Annual Meeting of this Association, the 3-A Sanitary Standards Symbol Administrative Council was incorporated, under the laws of Delaware. And the By-Laws of the Council were amended, so terms would coincide with those used in the charter issued to the Council.

It has been necessary to hold only one meeting of the Council during the recently-past twelve months - in conjunction with the Excelsior Springs meeting of the 3-A Sanitary Standards Committees. At that meeting the Council received two charges of non-conformance of farm tanks with 3-A Sanitary Standards for Holding and/or Cooling Tanks. One charge was followed up by the Council; the other was referred to the Chairman of the Technical Committee of D.I.S.A., who referred it to the Task Committee on Holding and/or Cooling Tanks.

The first charge pertained to failure of the cooling capacities of tanks tested by a State Agricultural Experiment Station, on off-peak-load electrical service. It was ascertained, however, that these tests were conducted prior to the date on which the first authorization to use the 3-A Symbol was issued to a fabricator of farm tanks, and that, as a result of the tests, compressor capacities or refrigeration area, or both, had been increased by the fabricators of tanks which had failed to meet 3-A Sanitary Standards for Holding and/or Cooling Tanks cooling requirements, even on continuous electric service.

The second charge pertained to the visibility of the underside of the bridge of tanks of one fabricator, the location and manner of connection of the joint in the shaft of the removable agitator, and the rate at which strained milk flows into the trough which distributes it over the ice-bank cooling surface. As previously stated, these charges were referred to the appropriate Task Committee, as set forth in the By-Laws of the 3-A Symbol Council.

The Task Committee rendered a decision that, technically, the underside of the bridge of the tank in question *is* visible from the exterior of the tank, that the joint of the agitator shaft *is* above the bridge, and of a design which does not violate provisions of the Sanitary Standards. The Task Committee obtained assurance from the fabricator that the rate of the flow of strained milk into the distributor trough would be adjusted so that half the capacities of tanks would be strained within 90 minutes. A statement to this effect from the fabricator is on file.



Mr. C. A. Abele has had a long and distinguished carreer in the field of public health. This began with the U. S. Public Health Service in 1917 and continued through various affiliations including the Alabama State Health Department, the Chicago Board of Health, and his present position as Director of Public Health Research for the Diversey Corporation, Chicago, Illinois. Mr. Abele is an active member in numerous Dairy and public health professional societies. He is a Past-President of the International, Chairman of its Committee on Sanitary Procedure, and was the recepient of its Award of Merit in 1952.

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[1]Presented at the 44th Annual Meeting of the International Association of Milk and Food Sanitarian, Inc., at Louisville, Kentucky, October 7-10, 1957.

This was the initial reference of a charge to a Task Committee, and procedure had not been pre-established. The complainant was not heard by the Task Committee. No member of the 3-A Symbol Council was present at the hearing. It is not to be inferred from these observations that the 3-A Symbol Council is dissatisfied with the verdict rendered by the Task Committee in this instance. It is obvious that, in future hearings of this nature, (a) the complainant should be heard, if he so wishes; and (b) a representative of the 3-A Symbol Council should be present, so that aspects of the charge in which the Council is particularly interested may be fully considered.

Rules for the conduct of Task Committee hearings will no doubt be considered at the coming meeting of the 3-A Symbol Council.

A year ago, at Seattle, it was stated that the Council was indebted to the Association to the extent of $400.00. That obligation was fully liquidated in April, and the Council takes this occasion to make known its gratitude to the Executive Board of this Association for the financial assistance extended at a time when Council Assets were non-existent. It is with a sense of pride and accomplishment that the announcement is also made that all other indebtedness of the Council has also been paid, and that the bank balance on this date is a comfortable one.

The names of concerns to which authorizations to use the 3-A Symbol have been issued have appeared in the April, June, July, and August, 1957, numbers of the Journal. It is recognized that those lists, appearing in segments in various numbers of the Journal, are of comparatively slight ready reference value. The Council is, therefore, giving thought to the advisability of printing a complete list to date, and supplements from time to time, to be published in the Journal, with reprints available for transfer to folders or binders of 3-A Sanitary Standards.

Between May 1, 1956, and September 30, 1957, a total of 75 authorizations to use the 3-A Symbol had been issued by the 3-A Symbol Council. The categories of types of equipment, and numbers of authorizations in each, are tabulated below:

Authorizations Issued — 5/1/56 to 9/30/57

0101	Storage Tanks	10
0201	Rotary Pumps	8
0400	Homogenizers	2
0501	Automotive Tanks	11
0805	Piping Fittings	3
0901	Thermometer Fittings	1
1000	Filters	1
1100	Plate Heat Exchanges	7
1300	Farm Cooling Tanks	26
1400	Leak Protector Valves	2
1500	Bulk Milk Dispensers	4
	TOTAL	75

All authorizations which expired prior to October 1, and most of those which expire this month, have been renewed for another twelve months.

Opportunity is again taken to reiterate that authorizations to use the 3-A Symbol are *not* predicated upon the findings of inspections, made at the fabricating plants, of prototypes of the various types of equipment. They are, instead, predicated upon declarations by a representative of the applicant concern, of knowledge of the pertinent 3-A Sanitary Standards, initialling of each paragraph of every section of the reprint of the Sanitary Standard to which the equipment conforms, and signing of the reprint, and assurance that an organized inspection of finished units will be maintained for the duration of the authorization. In addition, descriptive literature, photographs, and drawings, if necessary, are submitted to support the application. These documents are carefully reviewed by the Secretary of the 3-A Symbol Council. In event of uncertainty relative to conformance, the question is submitted to the other seven members of the 3-A Symbol Council for group decision.

Making due allowance for the human element, this system of declarations, and reviews of submitted data concerning the material, design, and construction of equipment has limitations as a basis for the issuance of an authorization the justification for which is beyond question. It must be borne in mind that a specimen of the equipment is not available for determination of prescribed functioning; but that a decision must be reached on the basis of one or more photographs, published statements, and written assurances. It must be apparent that, despite the moral certainty of a fabricator that the equipment covered by an application fully conforms, and despite the exactitude with which the review scrutinizes the application and corollary material, there are potentialities for overlooking a condition which should not exist, or of assuming the existence of a detail which has not really been incorporated into the design. Furthermore, there is always the potentiality for structural defects and functional shortcomings, unobserved during the final inspection at the fabricating plant.

Emphasis upon this aspect of the 3-A Symbol Program may appear to subject the program to question. This realistic attitude has been taken, however, because there is no point — actually there may be a hazard — in being unrealistic and utopian.

In nearly a year-and-a-half of operation of the 3-A Symbol Program, the only complaints of unwarranted use of the symbol to be filed with the 3-A Symbol Council are those herein discussed. Hundreds of pieces and units of equipment, bearing the 3-A Symbol, have been placed in service during this interval. Is it to be presumed, by members of the Council, that the program has brought about the millenium in fabrication, finish, functioning, etc? Or, is it to be deduced that sanitarians have ceased to inspect equipment bearing the 3-A Symbol, because they rely completely upon the appearance of the Symbol? Or do they note instances of non-conformance by equipment bearing the 3-A Symbol, but fail (for unknown reasons) to report such instances to the 3-A Symbol Administrative Council?

Members of the Council are not inclined to the belief that the 3-A Symbol Program is, at this stage in its development, functioning perfectly. They are concerned, moreover, that regulatory sanitarians may be delegating to the Council a function which it cannot, alone, discharge. Unless there is some degree of checking of symbol-bearing equipment when installed, final inspection by fabricators may become perfunctory. No one receives remuneration of any nature for service on or for the 3-A Symbol Council. There is too much time and effort involved in unremunerated membership on the Council to warrant continuation of the program should it show signs of degenerating into a sham.

Without further belaboring this aspect of the subject, the 3-A Symbol Council wishes it to be understood that it does not yearn for and solicit charges of misuse of the 3-A Symbol, in order that it may exercise its investigative authority and punitive powers, and dramatize its existence. Conversely, however, it wishes to assure all that every charge of symbol misapplication will receive prompt attention. In the interest of economy in correspondence and elapsed time, charges should be specific with respect to the nature and degree of non-conformance noted, and should identify the equipment by name of manufacturer; type; and model and serial numbers; by whom and when purchased; and by whom, when, and where installed.

The representatives of this Association on the 3-A Symbol Council include three Past-Presidents, who are fully cognizant of their responsibility and obligation to the Association membership. The other members of the Council are equally dedicated to the interests of users of equipment, and to all manufacturers whose equipment conforms to 3-A Sanitary Standards in all respects. But, the program which has been so promisingly inaugurated was launched with the sponsorship of this Association; and its ultimate success, to the full satisfaction of all concerned, demands the continued personal interest of every member of this Association. That interest is sincerely solicited.

USEFUL TECHNIQUES IN THE DEVELOPMENT OF A FOOD SANITATION PROGRAM[1]

CLYDE B. ELLER

Tulsa, Oklahoma, City County Health Department

In discussing the objectives of the National Council on Food Protection, Dr. Henry F. Vaughan, Dean of the School of Public Health at the University of Michigan, summed up for this and probably all groups or agencies interested in food sanitation, when he said, "The ultimate objective is to encourage people to realize the value and demand quality food, well prepared, served in a clean and sanitary manner in clean, pleasant surroundings, whether at home or any other place where food and beverages are served" (*1*).

Using this objective as an overall goal and a measuring stick, the Division of Sanitation of the Tulsa City-County Health Department reviewed its accomplishments in the field of sanitation in the fall of 1954. The results of this review left much to be desired if the goal was to be even approached. The usual program was being followed of regular inspections following an ordinance and code based on the 1943, USPHS Recommended Ordinance and Code for Eating and Drinking Establishments (2).

This code had been effective, and a program of higher professional standards for new sanitarians combined with in-service training for sanitarians without previous formal education in biological sciences and public health had raised our "survey" sanitation rating greatly over a four year period. However, the emphasis of this code and the inspections was, unfortunately, primarily on fixtures and construction with little emphasis on food service methods. Someone has said that a stainless steel kitchen does not keep the thumb out of the soup and implied, thereby, that only learning proper food service *habits* could do this. Obviously, thought must be given to help teach food service personnel those proper habits. But what about the goal, of encouraging people to value and demand good food service, at home as well as at the public eating place? Surely some means of doing this must also be encouraged. Could, perhaps, the two be combined? After two years of trial, we feel the answer is an emphatic yes. This, then, is the story of the development, primarily, of a food service training program in Tulsa and Tulsa County. In many ways not too different from many others preceding it in other communities, but one with emphasis also on community- wide education. In addition, we have described some auxiliary techniques developed to implement the accomplishments of the training program in the overall food sanitation program.

Clyde B. Eller received the engineering degree at Iowa State College in 1942. After serving in the army, he returned to school at the University of Michigan for the M.P.H. degree. He started his Public Health career in 1946 in Kansas, first as a sanitary engineer in a county unit as a sanitation consultant and then as a district engineer with the Kansas State Board of Health. He left Kansas in 1951 for his present position as Director of Sanitation of the Tulsa, Oklahoma, City-County Health Department.

A survey made by the staff of the "Health Officers News Digest", of 218 local health departments on food service employee training programs was released in August, 1954 (*3*). This survey showed that an overwhelming majority of the departments conducting such programs considered them not only desirable but essential, resulting in cleaner premises and better food service practices. A considerable portion of those participating in the survey indicated the desirability of such programs being on a permanent, continuing basis.

In making plans for instituting a food service training program, two significant things were decided on as initial steps. First, a series of one-session training programs was scheduled for several convenient location in different sections of the community for operators, managers, and supervisors of all eating and drinking establishments. Although the amount of training accomplished in these sessions was not great, they served as an excellent means of discussing the establishment of a permanent training program for all food service personnel with a very broad repre-

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[1]Presented at the 44th Annual Meeting of the INTERNATIONAL ASSOCIATION OF MILK AND FOOD SANITARIANS, INC., at Louisville, Kentucky, October 7-10, 1957.

sentation of the food service industry. Through persistent encouragement by the district sanitarians, over fifty percent of all eating and drinking establishments were represented. There was an almost unanimous agreement that similar but more extensive training sessions should be developed for all food service personnel and that consideration be given to making attendance compulsory.

The second initial step was incorporated in the plans for the five new district public health centers which were to be built in five Tulsa County towns. A departure was being made in these centers from the usual ones by including auditoriums which could be used as separate units from the office and clinic units. The development of these has been described in another paper by Dr. T. Paul Haney (*4*). The philosophy for including these auditoriums for public use was in keeping with his broad definition of public health. A further departure that tied in well with the plan for a food service training program was the provision of model kitchens adjoining the auditoriums. equipped with basic, commercial fixtures. It was anticipated that these kitchens would be used for preparing food for groups at luncheon and dinner meetings. By adding a folding door across the side adjoining the auditorium, placing the serving and warming tables on casters, and aligning the rest of the equipment in a U-shape on the other three walls, each kitchen in effect became a show room and a stage for future food service training classes.

Plans for a comprehensive, continuous training program now began. The assistance and advice of adult education and other educational personnel was enlisted as well as using the very helpful comments and suggestions gathered from the restaurant operators, The concept of compulsory training for all personnel was included, but it encountered some opposition. A committee appointed by the local restaurant association to work with the Health Department on developing an ordinance establishing the program, objected on the grounds that some personnel were already well-founded in the principles of food sanitation. These, they felt, need not attend the classes. As a means of separating or classifying the personnel, they suggested administering a written examination based on food sanitation, personal hygiene, and good food service habits. This suggestion was adopted and an ordinance was adopted in Tulsa, the principal city of the county, with eighty percent of the total population of the county.

Initially, one general examination was given all personnel, but after a trial period, similar but more specialized examinations were developed for four classifications: cooks, waitresses, bus boys and dishwashers, and fountain and tavern workers. The examination consisted of twenty-five true-false questions and twenty-five multiple choice questions. A grade of eighty percent was selected as the passing grade. Those falling below that grade were required to attend two two-hour training sessions.

At the first session, the fundamentals and practices of everyday bacteriology were discussed: what germs are, how they grow, what kills them, etc. Through the use of slides, film strips, and lectures, application was made to the individual at home and on his job in the food service industry. The second session was devoted to the importance of personal hygiene and the way in which disease is spread from person to person. Again, slides, film strips, and motion pictures were used to show the individual the application to food service and their own food service habits. The classes were on a level designed to give all workers the best information on disease prevention, safe service and preparation of food, and general sanitation, regardless of their duties about the establishment.

During the first eight months, eighty percent of the 3,600 persons taking the tests passed. By categories, there was a range from 48 percent passing for bus boys and dishwashers to 91 percent for waitresses. Two things were done as a result of this analysis. First, examinations were modified somewhat to strengthen the waitresses and cooks tests, to try to take out ambiguities, and to simplify wording that tended to make them I.Q. tests. Secondly, an effort was made to increase the percentage attending the classes of instruction. Persons attending often came to classes with a defensive attitude — "They were being *made* to attend." They had failed the test and were being singled out as "dumb heads" by their fellow workers. Invariably, after attending, they were pleased by the course, by what they had learned, and were proud of their new-found information which they happily paraded back at their place of work. They were gently urged to encourage others to attend, even though they had *passed.*

Concurrently with the establishment of the training program, a monthly sanitation news letter was instituted. This was mimeographed, single page, legal size and was sent to every eating and drinking establishment. Initially it was used to explain the purpose and operation of the food service training program,

including the monthly schedule of classes. Almost immediately, however, it became the accepted means of communication between the Health Department and the restaurant industry. When it was discovered that some persons taking the written tests could not read, or perhaps only very poorly, the "Newsletter" invited them to go to classes without taking the examination, if they desired. Not only those who were semi-literate, but many others made nervous by the thought of taking a test accepted this invitation passed on to them by the operator receiving the "Newsletter". When someone inquired if their sister "could just sit in on the second session of the class" because she had enjoyed the first session so much, th "Newsletter" again invited as many as desired to attend and to bring their friends if they wished. Attendance picked up! The reputation of the classes as interesting and something that would be helpful to everyone began to become established.

Since the initial start, the "Newsletter" has also served as a medium for passing on new information from the literature, for introducing new phases of the food sanitation program, and for timely suggestions on sanitation. The local newspaper early had used the "Newsletter" as a source of information to be passed on to the general public as news about this program. Now they began to base feature stories of general interest and information on items appearing in the newsletter. These articles were successful. After all, everyone ate food; everyone was interested in food sanitation! Perhaps work toward a goal of persons valuing and demanding good food service could be carried on successfully with the training program, as had been hoped.

Several areas were explored to help in this direction. Radio and television stations were contacted, and they were encouraging. The Health Department acquired a motion picture camera and short action shots of the classes appeared in the television newscasts, together with an explanation of what they were for and how they operated. Several community groups became interested and asked for adaptations of the material to be presented before them — business women's groups, senior Boy Scouts, nursing groups, Civil Defense wardens, etc. The Health Officers News Digest's folders entitled "Sanitation Follies" were found to be especially useful as the basis of discussion with such groups.

Increased information and awareness of germs and their transmission in our food service personnel group had led to reinstituting routine swabbing of utensils in all establishments as a teaching device. Proper utensil sanitization and use of single service containers was being stressed. Dissatisfaction with the usual inspection report for eating and drinking establishments had led to the development of a check list of *methods* to supplement the regular one covering construction and facilities. When an opportunity to put on a thirty minute television program occurred, we were ready to tell the story of our food sanitation program as it affected the individual. This show was one of a series dealing with medical problems, entitled "House Call", and a good viewer rating had been established. Our presentation included scenes of waitresses using *poor* techniqus followed by the *correct* method of setting tables, clearing tables, serving butter, and serving ice in a water glass; of cooks sneezing on the job and remembering to wash their hands at handwashing facilities conveniently located in the kitchen next to the cooking center; of sanitarians taking swab tests and the laboratory processing the swabs; and of a portion of our training classes using some of the slides utilized in our second session.

We had a good response. Many comments were made indicating we had increased the individual's awareness of food sanitation, of food service methods. To supplement this in our food sanitation program, the check list and accompanying code on food service methods was used at least once in each establishment. Since many of the items required observation at different times of the day (as during preparation, cooking, and then serving a meal) the partially completed check sheet with accompanying code was left with each operator to be completed by the time of the next regular inspection. Thus, for the first time in many cases, we had self-inspection being carried on. Continuation of such self-inspection has been encouraged by the district sanitarians, for it engendered a feeling of cooperation and teamwork between the operator and the sanitarian. Each district sanitarian keeps a small loose leaf notebook containing, on a separate sheet for each establishment, a summary of several previous monthly inspections and utensil swab counts. Most operators are anxious to see how their record stands, whether they have corrected violations noted on previous inspection, and what will go into the notebook as comments from the present inspection.

Currently, the food service training program has been operating in the City of Tulsa two years. Because of a high rate of turnover in food service personnel, the proportion of persons not passing the test

has remained about the same - one out of five. The number of persons attending classes, however, is closer to two out of five. Special sessions of the classes are given, on request, at larger restaurants, school cafeterias, church kitchens, hospital kitchens, and private club kitchens. The manager of the establishment guarantees a minimum of ten in attendance and usually sees that all of his employees attend. Food processors, such as bakeries, and food manufacturers have been included in the training. A second, continuing class has been set up for workers' convenience in a district health center in the negro district. In three outlying county towns, classes are being held in the new health center auditoriums and kitchens. These classes include *all* food service personnel, including grocery store workers, for at least part of the instruction. A fourth county town is presently considering a similar suggested ordinance establishing food service training.

And so, today, the Food Service Training Program has served to stimulate an awareness and a concern for proper food service in a substantial segment of the population of this community. It is hoped that through continued community-wide contacts in the newspaper, television and through the school curriculum this awareness and concern will grow. For it has been truthfully said that a successful enforcement program cannot long exist without the understanding and the support of the community.

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THE RESPONSIBILITY OF THE DAIRY INDUSTRY TO THE CONSUMER[1]

J. C. Flake

Evaporated Milk Association, Chicago, Illinois

Serving the best interests of the consumer is the responsibility of industry and of regulatory officials. This requires that both be adaptable to change; have a long-range point of view; and concentrate on problems of the future rather than those of the past. Emphasis is needed on fundamentals in milk quality and sanitation; increasing consumer appeal; and continual increase in efficiency of dairy production.

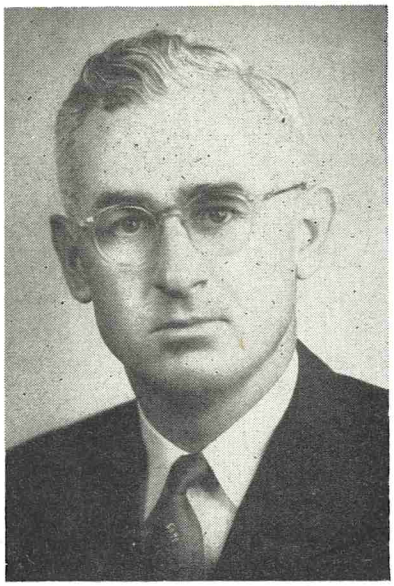
If the responsibility of the processors and distributors of milk and dairy products can be reduced to a single paragraph it might well be expressed somewhat as follows:

The job of the dairy industry is to solve present and future problems in the best interests of the consumer. This means recognizing and evaluating the profound changes that are taking place in the dairy industry, in all agriculture, and throughout the economy. It means developing the capacity to influence as well as to adapt to these changes. Especially it means looking to the future with a long-range point of view.

The dairy industry has come a long way in the United States. Both the industry and regulatory agencies can be proud of the many accomplishments. A great dairy industry has been built that can amply meet the present and foreseeable consumer demands for healthful, high quality milk and dairy products. The great achievements in quality and sanitation have given consumers full confidence in all dairy products. Much credit is due the efforts and foresight of the industry, the medical profession, regulatory officials, and agricultural colleges.

Yet there are still many problems, and the future promises to bring even more. Industry must take the lead in solving these problems. Regulatory agencies must help. The responsibility and objectives of industry and regulatory authorities have a wide area of common ground. This area can be even broader. A key objective of both groups should be to expand their joint efforts to serve the consumer and not merely to conform to rules and regulations.

As a background to discussing a few of the problems and objectives of the dairy industry, perhaps brief consideration should be given to two factors that demand prime attention in today's planning. These are the matter of change and of having a long-range point of view.



Dr. J. C. Flake joined the Sanitary Standards staff of the Evaporated Milk Association upon completion of his graduate work in Dairy Industry at the University of Wisconsin in 1940. He is a graduate of the University of Tennessee, received his M. S. degree from Purdue University and Ph. D. degree from the University of Wisconsin. He did milk sanitation work for USPHS during World War II and at present is Administrator of the Sanitary Standards program of the evaporated milk industry.

There have been many editorial and news references to the tremendous pace and importance of change in recent years. For example, Earl L. Butz, former Assistant Secretary of Agriculture, recently stated (9) that "A scientific explosion is occurring in our midst."

C. F. Huffman, President of American Dairy Science Association, told the 1957 annual meeting of that organization (4) that agricultural colleges have "failed to realize that science and agriculture are changing so rapidly that our concepts of education are having a hard time to keep up with the signs of the times."

A recent editorial in the *American Milk Review* (6) stated "There is a deep, fundamental current of

[1]Presented at the 44th Annual Meeting of the International Association of Milk and Food Sanitarians, Inc., at Louisville, Kentucky, October 7-10, 1957.

change sweeping through the dairy industry. The change is primarily a product of people and the way in which they work. On the one hand are the new markets and the new types of markets that have evolved as the nation has grown. On the other hand are the dislocations and adjustments created by new knowledge and new technology. Fewer cows and fewer farmers are producing more and more milk. Fewer plants are distributing more and more milk over wider areas than ever before."

". . . The status quo cannot be preserved. He who would oppose change because it is change or because it disturbs his own private world must share with the impatient radical the responsibility for the turmoil that results. Time cannot be made to stand still nor can it be made to move faster. The great task facing the industry is to grow with the times, logically, soundly, fairly."

The necessity of bold planning for the future has been ably discussed by Ralph J. Cordiner, President of General Electric Co. Mr. Cordiner said that new imperatives are at work today which give the business leader, and others, no practical alternative except to take a long-range point of view. These imperatives include:

1. Pressures of a changing population. In 10 years U. S. consumers are expected to want 40 per cent more goods and services, to be produced by only 14 per cent more workers. This means productivity must be increased by forward-looking technological improvements.
2. The decision of the American people that steadily rising levels of living, plus economic stability, are both desirable and achievable. (Dairy farmers and their families expect to participate in this increase in the standard of living.)
3. The forceful pace of technological change, and the rise of research and innovation as established techniques of competitive business enterprise. Few substantial businesses today can expect to grow without a dynamic plan for continuous innovations in processes, facilities, methods, organization, leadership, and other phases of the business (*2*).

It is most important for the dairy industry and for regulatory officials to have this long-range point of view and to concentrate on problems of the future rather than those of the past.

In the discussion which follows, consideration will be given to three of the objectives of the dairy industry. It is believed that these objectives should be shared by official sanitarians:

1. Emphasis on fundamentals in milk quality and sanitation.
2. Increasing consumer appeal.
3. Continual increase in efficiency of dairy production.

EMPHASIS ON FUNDAMENTALS

Enforcement of sanitary milk regulations has greatly improved milk quality and safety, and encouraged higher per capita consumption. Official supervision of the production of milk and milk products is in the public interest and is a necessary function of government. The record in this field is too successful to warrant abrupt or drastic changes, and none are suggested here.

However, in recent years many people have questioned the public health significance and necessity of certain sanitary regulatory items (*10*).

It is believed that it is time to re-examine the elaborate structure of milk sanitation regulations and control. The public health must be safeguarded, but this duty should not be pursued with reckless disregard for the consumer's pocketbook. The emphasis should be on specifications for herd health and quality standards as measured by objective tests (*12*).

Milk sanitarians are familiar with the report of the National Research Council on Sanitary Milk Control (*3*). This report indicates the need for only a limited number of basic requirements to insure a wholesome milk supply. The report concludes that more emphasis should be placed on three groups of requirements with respect to facilities and practices which are significant in the production of sanitary milk. "These essential features of sanitary milk production on farms are:

1. "Healthy cows and other factors reducing possibility of presence of pathogenic bacteria, such as fly control, potable water, and sewage disposal."
2. "Clean utensils given proper bactericidal treatment. This condition was associated with clean cows, clean milking barns, and clean milk houses provided with hot water and two-compartment wash vats."
3. "Prompt cooling of milk to 50° F. or below which was always accomplished by electric refrigeration, except that milk to be pasteurized promptly after production need not be cooled."

"Good production practices and essential facilities should be the goal and most particulars of structure and design should be recommendations and not requirements of the sanitary laws. Such emphasis on the important factors of milk sanitation would maintain and improve the measurable quality attributes of

milk while reducing the number of requirements which tend to harass dairymen and to restrict the movement of milk between producing areas and new market areas."

This report also states that "There is no public health reason to increase the severity of satisfactory sanitary milk regulations, making them more detailed and rigid, when the milk industry of any market regularly complies with them. This applies to the regulations affecting milk production, processing, and distribution as well as to the standards for the quality of milk."

After a lengthy investigation, a U. S. Senate Committee reported in 1951 (*1*): "Unfortunately many local health ordinances have been adopted that go beyond the need for protection of the public. The design and operation of some indicate a desire to protect the status quo of producers or distributors as much as, if not more than, the public health. A system of trade barriers has grown up in the milk industry that has retarded the free flow of milk both intrastate and interstate."

Fortunately, much attention has been devoted by industry and regulatory agencies to the fundamentals of milk sanitation and to what can be done to facilitate the free flow of high quality milk. Progress has been made, but a great deal more work is needed in this field by both groups. It should be the objective of industry and regulatory officials to provide consumers with milk and dairy products, having all the characteristics that make them desired as food, at a reasonable price and with a minimum of rules and regulations.

INCREASING CONSUMER APPEAL

The dairy industry and regulatory agencies can be proud of the role they have played in improving the nutrition of the nation. Not only has milk-borne disease been largely eliminated, but there are many positive indications of improved nutritional health of the people. Dairy foods have done more than any other group of foods to improve the nutrition and well-being of the population. These products have been particularly important in increasing the intake of calcium, vitamin D, and high quality protein.

A dramatic example of the value of milk and dairy products was given recently by Dr. A. A. Weech of Children's Hospital, University of Cincinnati (*13*). Dr. Weech discussed the contribution to human welfare of the fortification of milk with vitamin D. He stated that today it is difficult to find a case of rickets, and most graduating medical students have never seen one. He further stated, ". . . It is perhaps brash to attribute the miracle of the disappearance of rickets to any single commodity. I am not alone, however, in holding the belief that the widespread practice of fortifying milk with vitamin D has been *the* most important factor. This viewpoint has been ably supported by the Council on Foods and Nutrition of the American Medical Association . . . at the time of the last tabulation in February, 1955, there were listed 340 different brands of evaporated milk in this country, all of them fortified with vitamin D. The opinion seems justified that this almost universal fortification of evaporated milk has done more than has anything else to eradicate rickets in the very segment of the population least liable to avail themselves of what we may call the newer knowledge of nutrition."

However, it is widely recognized that milk consumption in the United States falls well below the amount recommended by nutritionists. Therefore, a major objective of the dairy industry and of milk sanitarians should be to encourage ways of increasing consumer appeal and expanding consumption to levels more nearly in line with nutritional needs.

Keeping prices as low as possible will help do this. Studies have shown that per capita sales of milk tend to increase with a decrease in price and that people with low and medium incomes tend to make more use of low-priced milk than those in the high income groups (*1*).

Another way to encourage higher consumption of milk and dairy products is for the dairy industry and regulatory agencies to stress the positive attributes of the products and to build these up, rather than the negative aspect of freedom from disease-producing organisms. This means emphasis on food value, cleanliness, flavor, keeping-quality and composition. People drink milk because they like it and for its nutritional value. Attention should be directed to the value of the product itself and to improving the product, rather than appealing to the fear complex by reference to "safety" which implies near escape from some hazard. The dairy industry and sanitarians inform the public that they have escaped illness caused by milk when its safety and protective measures are emphasized (*8*).

Certainly, every practical effort must be made to insure the safety of milk and dairy products. However, this problem has been largely solved through adequate pasteurization and other processes, plus protection of the finished product from contamination.

In this connection it may be well to remind ourselves that pasteurization is still the one positive

safeguard for a milk supply. In spite of all the refinements in regulations and inspection of milk production, it is impossible to depend on the human element. The one dependable safety measure is adequate pasteurization and protection of the pasteurized product (7). This is a strong argument against burdening the price of milk with unnecessary detail and frills in farm production controls, when the maximum in impractical and costly regulations still will not give postitive protection without pasteurization.

However, more can be done to improve the flavor and keeping-quality of milk. The increase that has occurred in the time between production and consumption makes this particularly important for fluid milk. With the farm tank and alternate day pick-up, outer-market sales, and intermittent delivery to stores and consumers, it is not uncommon for well over a week to elapse from the time milk leaves the cow until the pasteurized product is consumed. This necessitates more and more attention to clean production methods, clean milk handling equipment, enzymatic action and other chemical changes, adequate refrigeration on the farm and in the plant, and clean plant equipment. The complete sanitation of all post-pasteurization equipment is of prime importance to keeping-quality as well as to the safety of the milk.

Continual Increase in Efficiency of Dairy Production

Another major objective of the dairy industry is continual increase in efficiency. Sanitarians must help achieve this objective. While the necessity of ever increasing efficiency applies to all phases of production, processing, and distribution, this discussion is directed to dairy farm production.

In considering the importance of increasing efficiency of milk production it is necessary to recognize some of the changes that are taking place, and are expected in the future, in agriculture as a whole, as well as in all of industry. It is no longer news to mention the great increase in industrial productivity in this country. Productivity in the United States has been increasing about 2 per cent a year for nearly a century. However, the editors of *Fortune* have predicted that in the next quarter-century it will probably increase at an average of 3 per cent a year. If this extra percentage point materializes, it will have a profound effect on the economy, for production per man-hour will double in less than 24 years.

Productivity has increased rapidly in recent years in certain branches of agriculture. Efficiency in dairy farming has lagged behind, but fortunately it is beginning to catch up. The means are available for greatly improving the efficiency of dairy production. It is up to the dairy industry to see that they are applied. Regulatory officials and sanitarians must not impede this progress. From here on the economics of the problem must be considered. Will the farmer's and the consumer's pocketbooks stand the recommendation or requirement? While farming is a way of life, it is also a business. It must be a sound business.

During the next 20 years, American agriculture is expected to be called upon to increase its output by some 30 to 40 per cent on approximately the same amount of land as is in use today, and with fewer farm workers. Population is expected to increase about 35 per cent to some 220,000,000. Also economists foresee a doubling of the nation's total economy with an increase in per capita income of some 60 per cent.

The necessity of increasing the efficiency of milk production has been well expressed by Professor Herrell DeGraff of Cornell University (5):

"A small herd of mediocre dairy cows can no longer produce a net income that is appealing to large numbers of families compared to what they can earn at alternative employment. This will be even more true in the future than it is now."

"A hard and fundamental fact that has not been properly recognized in the present politically inspired yapping about agriculture, is that a farm family can produce, from agriculture, a comparable level of living with non-farm families only by steadily increasing their volume of output — per hour, per day, per year."

The following statement from Professor W. E. Petersen of the University of Minnesota is particularly applicable to this problem (*11*):

"Dairying is in for the greatest revolutionary change in its entire history. The objective is an enormous increase in efficiency — the measure of which is to be the pounds of milk per acre and pounds of milk per man-hour. We have the technological and practical knowledge that will enable us, on the average, to double the milk produced per acre and increase by four times the amount of milk produced per man-hour. In addition to this increase in efficiency we shall give more attention to making the job more attractive to the worker and we shall raise some serious questions about control measures now enforced as to whether or not they contribute or hinder advance toward the objective of furnishing consumers with the best quality product to serve their best interests."

"To attain these objectives we must have better cows, make greater use of roughage, mechanize the dairy farm, and above all have an open mind toward new developments."

This discussion is not meant to infer that only large commercial dairy farms can survive. Dairy production is largely a function of the family farm and probably will continue to be so. Small herds are still profitable in some sections of the country where the farm operation is diversified or where the farmer has some outside employment. However, regardless of the size of the herd, more and more efficiency is necessary in the production, storage and feeding of forage; in the housing, feeding, milking and management of the dairy herd; and in the handling of the milk. This efficiency is in the interest of the consumer because it will increase the production of milk; decrease the cost; help promote consumption of milk and dairy products; and will contribute to the nutritional health of the people.

Before concluding, it should be pointed out that sanitarians and industry must plan for the future with full regard to the effect of regulations and control measures, and all of their activities, on the competitive position of the dairy industry. There is a limit to the food intake of the consumer and to his expenditures for food. Numerous other foods compete directly with milk and dairy products. Moreover, every commodity and service in the economy competes for the consumer's dollar.

Butter has lost half of its per capita market in the past 20 years. Vegetable oil products are a significant factor in the frozen desserts picture. Filled milk has made large gains. Vegetable protein products are on the market as dairy substitutes. The early feeding of solid foods, containing no milk or dairy products, to infants has decreased their milk intake. Such foods are also gaining importance in geriatrics and in the feeding of invalids.

The future of the dairy industry is bright but it is not guaranteed. A constructive attitude and cooperative effort by all concerned will bring success.

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REPORT OF COMMITTEE ON APPLIED LABORATORY METHODS — 1957[1]

This year the Applied Laboratory Methods Committee sponsored actual laboratory research on a few selected problems in addition to continuing to review the literature on pertinent subjects. Seven subjects were selected for study and seven subcommittees were appointed to handle the selected problems.

BIOASSAY AND CHEMICAL TESTS FOR FOOD POISONING

This subcommittee consisting of Earl F. McFarren, *Chairman*, and Ralph L. Gostilow, reviewed the work that has been done in testing for stapylococcus food poisoning and paralytic shell fish poisoning .

The subject "Food Poisoning" recently has been brought up to date in the well known book by Dr. G. M. Dack (*1*), which is now in its 3rd Edition (1956). However, there have been some very recent advances in methodology of (*a*) determining the presence of potential food poisoning staphylococci in food (*b*) determining the probable scource of staphylococci in incriminated food, and (*c*) determining the ability of individual strains of *Staphylococcus aureus* to produce enterotoxin.

The sanitarian is constantly searching for more rapid methods for detecting the presence of potential food poisoning organisms. One of the principal drawbacks of the methods commonly used for enumerating microrganisms in food is the long incubation time required in growing the organisms. In many instances, a food item is consumed prior to the time that the results of examination are available. This is particularly true when tests are being conducted for food poisoning organisms such as staphylococci.

The common media and methods which are used to enumerate S. *aureus* in foods are well known and will not be discussed here. Mossel and Vendrig (*2*) have reported much success with the use of a drop plate method of plating on Chapman's medium. They found the surface colonies of S. *aureus* which developed on such plates to be easier to distinguish from the aerobic bacilli which grow on this medium than similar colonies growing in pour plates. Also, the colonies developed may be used directly for coagulase tests.

Wilson *et al.* (*3*) have described a rapid presumptive test for coagulase-positive staphylococci in foods. Briefly, this involved enrichment in mannitol brain heart infusion broth with 5% NaCl. The culture is incubated on a shaker for 5 to 6 hours at 35° C., a gram stain made, and the coagulase test run. This test is reported to detect the presence of staphylococci at populations as low as 5×10^5 per gm. in foods with much higher populations of other organisms, and in populations as low as 5×10^3 when present in pure cultures. The total time involved in running this presumptive test is only 7 to 9 hours and appears to offer a considerable advantage over other common procedures used today for determining the presence of these organisms.

The problem of determining the ability of strains of S. *aureus* to produce enterotoxin is still a difficult one in most laboratories. The "Dolman kitten test" has been reevaluated by Matheson and Thatcher (*4*) with encouraging results. In most instances, definite vomiting was observed after intraperitoneal injection of culture filtrates of enterotoxigenic strains. Only in a few instances, when resistant cats were used or where very small amounts were injected, vomiting did not occur. No "false positive" reactions were obtained with control preparations under normal conditions or with four uninoculated media. Based on 315 animal injections they "---- suggested that for most biological tests such results would be considered to have a high order of positivity."

Further studies by Thatcher and Matheson (*5*) showed that the enterotoxin of S. *aureus* is a separate and distinct entity from the *alpha-, beta-, or delta-*lysins. It was noted that the lysins could be completely removed from culture filtrates by boiling for 15 minutes and then incubating with ascorbic acid (5 mgm. per ml.). This treatment should reduce the chances of "false-positives" in the "Dolman kitten test" for enterotoxin.

Filtrates of 12 food-poisoning strains of S. *aureus* were shown to produce a characteristic response when added to Ringer's solution in which lengths of small intestine from rabbits were suspended (*7*). No response was observed on addition of filtrates from 12 pyogenic strains.

Much work has been reported recently on bacteriophage typing of staphylococci. This could be a useful tool in matching strains isolated from food with those isolated from potential sources infection. How-

[1]Presented at the 44th Annual Meeting of the INTERNATIONAL ASSOCIATION OF MILK AND FOOD SANITARIANS, INC., at Louisville, Kentucky, October 7-10, 1957.

ever, the ability to produce enterotoxin apparently is not restricted to particular phage groups. Thatcher and Simon (6) found wide variations in the ability of strains of staphylococci to produce coagulase, phosphatase, alpha- and beta-hemolysins, and enterotoxin within a phage group. They concluded that coagulase production was the most neearly consistent single indication of toxigenicity among the characteristics tested.

The literature and unpublished research on paralytic shellfish poison has recently been reviewed (8) However, this review has not had wide circulation; as a result, many sanitarians are probably unaware of recent developments in the methods of assay for the poison. Furthermore, some of the recent developments have not as yet been published; this report serves only to review briefly these developments and to indicate where they have been or soon will be published.

For control purposes, the tentative standard procedure (9) for determining the concentration of paralytic shellfish poison has been a mouse bioassay. In the spring of 1955, the U.S. Public Health Service sponsored a Canadian-United States Conference on Shellfish Toxicology (*10*) to review the progress made following the use of this tentative procedure as modified in 1950, and to discuss recent developments that might further improve the assay. At that time, the isolation of the poison in pure form by Schantz and associates (*11, 12*) was announced. These papers on the purity and proof of purity of shellfish poison have been accepted for publication and should appear about October of 1957. At the same meeting (*10*), the suggestion was made that the purified poison be used as a reference standard for the bioassay, and the U.S. Army Chemical Corps offered a limited quantity of the purified poison to the U.S. Public Health Service for this purpose. As a result, a study was made of the requirements for preparation, distribution, and use of the standard. On the basis of this study an "interim plan" for utilizing the purified poison to standardize the bioassay was drawn up by the U.S. Public Health Service (*13*). Following the issue of this "interim plan," a collaborative study based on the procedures outlined therein was conducted. The results of these studies will be presented in a paper by Schantz, *et al.* (*14*), at the Association of Official Agriculture Chemists Meeting in October of 1957. These studies indicate the basis for establishing certain standard conditions to determine the micrograms of purified poison equivalent to one mouse unit (CF value), and demonstrate the usefulness of the reference standard in assaying poisonous clams.

Although the bioassay appears quite satisfactory for the assay of high toxicity shellfish (*14*), it may underestimate the poison in low toxicity shellfish by as much as 60 per cent, due to the effect of salt. It also leaves much to be desired in cases where mice are difficult to obtain and keep in condition for assay. A chemical test for the poison would have the advantage of eliminating these difficulties. It is possible, based on the information reported by Schantz, Mold, and Lynch (*15*), that the purified poisons from the Alaskan Butler clam and the California ocean mussel give characteristic colored compounds with 3, 5-dinitrobenzoic acid, or picric acid in alkaline solution. A paper on the "Chemical Determination of Paralytic Shellfish Poison in Clams" will be presented (*16*) also at the A.O.A.C. meeting in October 1957; and it will be proposed that additional collaborative studies on the bioassay and chemical assay be conducted in order to establish whether these methods should be adopted as "official methods" of analysis.

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ANTIBIOTICS IN PRODUCER'S MILK

This subcommittee consisting of R. B. Parker, *Chairman,* and B. M. Barney, conducted a letter survey to determine the importance of the problem of antibiotics in milk. A questionnaire was mailed to a total of 128 academic personnel, regulatory officials, and industry representatives. The questionnaire was concerned with: (*a*) extent of contamination; (*b*) possible analytical methods; (*c*) extent of cooperation of farm groups in emphasizing the antibiotic problem; (d) the awareness of the industry regarding possible sensitization of human consumer; and (*e*) evidences of a deliberate attempt to control bacteria by the addition of anitbiotics to milk.

The surveyed areas were split into four sections and three groups.

Sect. 1 — Eastern States	Group A — Ed. institutions
Sect. 2 — Central States	Group B — Enforcement agencies
Sect. 3 — Western States	Group C — Industry laboratories & associations
Sect. 4 — Canadian Provinces	

The tabulation below indicates the interest shown in the survey. Eighty-two of 128 questionnaries were returned.

	No. Inquiries	Number of replies	Per cent replied
Section 1	36	20	56
Section 2	56	38	68
Section 3	25	17	68
Section 4	11	7	63

In general, response to the questionnaire brought out several points of interest to the sanitarian. Only 21% of the industry group felt that the antibiotics problem was a serious one, whereas, 35% of the regulatory officials and 43% of the educational representatives felt that the problem was, indeed, a serious one. These results are somewhat surprising because a large portion of the information appearing in the literature has indicated that the problem was very serious as far as industrial groups were concerned. Although a number of those answering the question indicated that their assumptions were based on a definite analytical method, only a few indicated the use of a routine control program. Much of their information, therefore, appears to be the result of very tenuous evidences or of simply blaming all starter failures on antibiotics.

The response to the question on the cooperation of farm groups in emphasizing the importance of discarding milk after a cow has received antibiotic therapy indicated that definite efforts are being made by some producer groups. The University of Wisconsin Extension Service has done a particularly good job in this regard. However, much more work apparently needs to be done on the part of farm groups and extension officials in emphasizing not only the economic but the public health hazard of including antibiotics, particularly penicillin, in the milk supply. Several procedures, including the starter activity test, the Neal and Calbert Wisconsin test, and the disc method, were reported to be used as possible criteria for rejecting milk containing antibiotics. However, only 12 of the 82 responding to the questionnaire indicated that such a procedure had been used in their organization. Most responses indicated simply that if a starter failure occurred it was assumed that the milk contained an antibiotic.

Only five of the individuals responding to the questionnaire felt that there was any evidence of attempts to control the bacteria count in milk by the deliberate addition of antibiotics. On the other hand, responses to the question indicated that only a limited number of people appreciated the possibility that the ingestion of antibiotics, particularly penicillin, could serve to sensitize the human consumer. This would suggest that education, both of the producer and the milk

manufacturer, is a prime factor in the elimination of antibiotic contamination of the milk supply.

The responses from eight manufacturers of antibiotics surveyed indicated that they also are concerned with the problem of antibiotics in milk, but from a slightly different standpoint. Specifically, the manufacturers were asked if they had any information which might contribute toward the development of a worthwhile rapid test for antibiotics in milk. One manufacturer replied that since sensitization reactions occurred primarily among those persons ingesting milk containing penicillin, the assay of penicillin in market milk was the only problem involved. Another manufacturer submitted the very detailed tentative method apparently in use at the Division of Antibiotics, Department of Health, Education, and Welfare.

In summary, it may be stated that the development of a satisfactory analytical tool for the detection of antibiotics in milk at the plant level, remains to be accomplished. It is also apparent that milk producers are not now using those analytical tools available to them, and that much of the difficulty attributed to the contamination of milk by antibiotics can be traced to this specific situation.

STAINING PROCEDURES FOR THE DIRECT MICROSCOPIC EXAMINATION OF DAIRY PROCDUCTS

The subcommittee composed of D. I. Thompson, *Chairman,* and G. W. Shadwick studied the application of two widely used staining procedures to the examination of reconstituted non-fat dry milk. They also compared the Levowitz and Weber stain (L-W) with the Acid and Water Free Stain (AWF) when used for staining films of raw milk.

Staining Films of Reconstituted Non-fat Dry Milk

The aniline oil staining solution must be compounded very carefully to avoid precipitation of dye during storage. Stain showing a considerable separation of dye has poor staining qualities and should be discarded. The staining time (about one-half minute) required to produce the best contrast may be determined by the use of smears of reconstituted powders of predetermined count. The aniline oil stain characteristically stains non-fat milk films with poor uniformity. Nevertheless, under ideal conditions experienced technicians have found it to be very effective in staining heat killed bacteria in non-fat dry milk films.

The Levowitz and Weber Stain is very volatile and must be kept in a tightly sealed container during storage and preferably while being used. Stain left in an open staining dish becomes unusable very rapidly. An eight ounce wide mouth jar with plastic screw cap and liner is satisfactory for staining 1″ x 3″ or 2″ x 2″ slides. The L-W stain has the advantage of being simpler to use under field conditions. Experience in industry laboratories has been in favor of the L-W stain in staining heat killed bacteria. It is important to follow the procedure for drying the slides rapidly after staining[1] and washing the stained slides in warm water as described by Levowitz and Weber (*1*).

The accurate counting of non-fat dry milk films requires much more time than counting raw milk films. The heat killed bacteria usually stain less intensely. Therefore, the films must be examained more critically with continuous focusing up and down through the film. Often the bacterial cells have to be in very sharp focus in order to be visible. Raw milk films, on the other hand, with more intensely stained bacteria will often be visible even when not in sharp focus. A microscope with a flat field having the entire area of the field in focus at one time is very desirable for this work. However, this effect can be obtained with other microscopes by using an ocular disc with an inscribed circle. Only the bacterial clumps within the circle should be counted. It is necessary to count more fields with this procedure, but the advantage of having the bacteria in sharper focus makes the use of the ocular disc worthwhile. Also, the quadrants provide guide lines which aid in counting high-count samples.

The prevention of eye fatigue is very important in the examination of non-fat dry milk films. Glare may be reduced and excellent resolving power obtained by using Kohler illumination as described by Richards (2). Focusing type research lamps or specially designed built-in base illuminators may be used for this purpose. Binocular microscopes are less fatiguing than monocular types. Also, it is more restful to have the position of the microscope adjusted to the eye level of the seated microscopist. Powder samples of known direct microscopic counts (as determined by the official laboratory for instance) can be used to determine the efficiency of the microscope and illumination as well as the staining procedures.

Powder samples of known direct microscopic counts (as determined by the official laboratory for instance) can be used to determine the efficiency of this micro-

[1]A small fan such as the TV tube cooling fan sold by Allied Radio Corp., Chicago 80, Illinois, is effective in drying stained slides rapidly.

scope and illumination as well as the staining procedures. Powder samples having large numbers of faintly staining dead bacteria are particularly helpful in this regard. Such samples may be used to check stains that have been used and refiltered.

Studies have been conducted or are being conducted by the American Dry Milk Institute, the University of Minnesota, and the U.S.D.A. Laboratory in Chicago. These studies are being made in an attempt to determine the relative effectiveness of the two staining procedures and to determine the degree of variability between laboratories. The publication of these results is awaited with interest.

Comparison of the L-W Stain with the Acid and Water Free (AWF) Stain Applied to Raw Milk Samples

A preliminary trial of 112 samples of raw milk from Grade "A" farms showed somewhat higher counts when stained with the L-W stain. The L-W stain stained the bacteria more intensely and produced better contrast with the background than the AWF stain. The L-W films had the disadvantage, however, of showing more precipitated dye then the AWF stain. This did not appear to be a serious handicap, however.

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TEST PROCEDURES FOR EVALUATING BACTERICIDAL COMPOUNDS

This section was prepared by Dr. W. S. Mueller, *Chairman* of the subcommittee for this subject.

Two test procedures for evaluating bactericidal agents have been developed and used for some time in the University of Massachusetts dairy research laboratory. The macro test is described briefly in *Soap and Sanitary Chemicals*, September, 1947, and the mirco test is described in *Modern Sanitation*, June 1950.

The present report deals chiefly with modifications which have been made on the two methods since their publication. The macro method may be used to determine bactericidal kill from zero to 99.9999 per cent, inclusive; the micro method is suitable for determining 100 per cent kill and also for rapid screening tests.

The chief advantage for the Massachusetts methods is that they are less laborious than the Weber and Black test and the Chambers modification of the Weber and Black test, without sacrificing accuracy. In the Massachusetts methods the mixing of test organisms and test solution by swirling test tubes or flasks is eliminated by the use of a magnetic stirrer submerged in a temperature bath. Also, in the Massachusetts macro method the test organism is added with a syringe in a fixed position which assures greater uniformity for each test. When the micro test is used as a rapid screening test, transfers of inoculated test solution at the end of the contact period are made with a wire loop to broth, similar to transfers used in the phenol coefficient test. However, a major limitation of the phenol coefficient test, namely the frequent occurrence of skips and false positives, has practically been eliminated in the Massachusetts method by the use of newer techniques.

TEST PROCEDURES USED BY HEALTH DEPARTMENTS FOR THE EVALUATION OF GASKETS AND FITTINGS IN C. I. P. INSTALLATIONS

This report consists of a summary of information obtained by a letter survey conducted by the subcommittee consisting of F. W. Barber, *Chairman*, and H. H. Weiser.

The increased use of bulk tanks on the dairy farm and C.I.P. installations in the dairy plant has indicated the need for greater uniformity in procedures for the evaluation of the sanitary condition of lines and equipment cleaned in place. Although the 1953 Milk Ordinance and Code of the United States Public Health Service recommends procedures and standards for C.I.P. *lines* there are no uniform procedures or standards given for the evaluation of *gaskets* and *fittings* in C.I.P. installations. The literature was reviewed and discussions held with various individuals concerned with the evaluation of C.I.P. installations. Numerous methods for the bacteriological examination of gaskets and fittings were reported but no one suggested possible bacterial standards for these items.

In order to determine what action is being taken by regulatory officials on the subject of the evaluation of gaskets and fittings in C.I.P. installations this letter survey of various health departments was undertaken. A questionnaire was prepared which listed several methods for the evaluation of gaskets and fittings and also included a section on evaluation of C.I.P. lines. The questionnaire and a letter explaining the survey were sent to officials of the Departments of Health of the 48 states, Hawaii, Alaska, the District of Columbia, Puerto Rico and the Virgin Islands and to fifteen state universities. Replies were received from 34 health departments and nine universities.

Briefly summarized, the survey indicated that about 80% of the states reporting relied upon visual examination or a combination of visual examination and swab tests, rinse tests or product counts for the evaluation of gaskets, fittings and pipelines in C.I.P. installations. However, only 30% of the replies indicated any standards for gaskets or fittings and 50% gave standards for C.I.P. lines. The bacterial standards reported for gaskets, fittings and lines were those recommended in the Milk Ordinance and Code (1953) for pipelines cleaned in place, namely, 100 per 8 sq. in. or 2 per sq. cm. Eleven states in reporting made specific reference to the Milk Ordinance and Code.

For the examination of gaskets, six states reported a swab test on the surface of the gasket exposed to the product; three states reported a swab test on all gasket surfaces; and one state reported a rinse test on the entire gasket. For the examination of fittings, nine states reported using swab tests on surfaces expoesd to the product (swabbing of 1-2 inches of the inner pipe surface at joints) and two states reported using swab tests on joining surfaces.

The replies from the nine universities substantiated those from the states in which the universities are located. The importance of proper installation, proper cleaning and sanitization and visual inspection were stressed by several reports. Product counts apparently are used in the evaluation of some university farm installations. The bacterial standard of 100 per 8 sq. in. or 2 per sq. cm. was considered as lenient.

It would appear from the survey, literature review and discussions with those concerned with the evaluation of C.I.P. installations that more information is needed concerning the best method for evaluation and possible realistic bacterial standards for gaskets and fittings. Experience is indicating that the most satisfactory methods for the evaluation of C.I.P. installations are a combination of visual inspection, the pressure cotton swab technique of Holland *et al.* (Food Eng. May 1953), rinse tests of the entire gasket, and swab tests on the inner pipe surfaces at the joints. At present sufficient data is not available to even suggest suitable bacterial standards.

COMPARISON OF THE "MALLMANN" SURFACE PLATING TECHNIC WITH THE STANDARD PLATE COUNT

This subcommittee consisting of J. J. Jezeski, *Chairman,* W. C. Lawton, W. E. Glenn, H. B. Richie, and W. B. Moseley, compared the "Mallmann" surface plating procedure with the standard plate count utilizing results obtained in two different laboratories from raw, laboratory pasteurized, and commercially pasteurized milk samples. One laboratory reported results using this procedure for examining ground meat samples. The Mallmann procedure consists of placing a suitable dilution of a sample on the surface of a previously poured and dried nutrient agar plate and incubating the plate in the usual manner. Standard plating procedures where applicable and the Mallmann technic were followed closely. In testing the meat samples, the entire surface of the agar plate was inoculated by smearing the drop over the surface with a previously sterilized bent glass rod.

In attempting to determine which of the two methods gave a significantly higher count in these comparisons, it was found that averages of certain groups of samples had very little significance because of large variations between the populations of samples tested. Therefore, it appeared that a comparison of the two methods on individual samples as to which one resulted in a signficantly higher count or whether the two methods produced essentially equivalent results was a logical approach. In determining which method produced the higher count, therefore, or whether the two methods were equivalent in a paired comparison of a single sample, it was decided that if the lower count observed (by either method) was 80% or more of the higher count, the two methods would be considered to give equal results. If the lower count was less than 80% of the higher count, then the method giving the higher count was considered to be significantly better. In other words, there was considered to be no difference between the two methods unless the lower one was less than the higher by more than 20% of the higher count.

Laboratory No. 1 examined 35 samples of raw milk. The standard plate count for 20 of these was significantly higher, while the drop plate count was significantly higher in 5 samples. Fifty-nine samples of laboratory pasteurized milk examined and for 23 of these the drop plate results were significantly higher, while the standard plate count was significantly higher in only 11 samples. Of 48 samples of retailed bottle milk, 14 were higher by the drop plate and 10 were higher by the standard plate count.

Laboratory No. 2 ran 48 samples of raw milk. The standard plate count was significantly higher for 32 of these while the drop plate was significantly higher for 5 sample. Of 26 samples of laboratory pasteurized milk, 11 were higher by the standard plate count, while 7 were higher by the drop plate method. Of 28 samples of retailed bottled milk, 17 were higher

by the standard plate count, and 6 were higher by the drop plate method.

Laboratory No. 3 ran 16 samples of ground meat using 8 samples which had no cure added and 8 samples which had a cure added. Six samples which had no cure added were higher by the standard plate count and 2 gave the same result by either method. Two samples with the cure added were higher by the standard plate count while one sample was higher by the surface plate method.

It is evident from the above minimum number of experiments that the standard plate count yeilded higher count for raw milk samples than did the drop plate method. This was true for both laboratories, each of which was situated in a different section of the country. The reason for this difference was not determined but a logical explanation maybe that it was due to the presence of the surface active agent in the drop plate dilution water which might serve to inhibit certain types of bacteria. The difference in counts, and difficulty with spreader types noted in both laboratories indicated that the drop plate method may be unsuitable for use on raw milk supplies. It would seem, however, that there is greater possibility of using the drop plate method on Laboratory pasteurized samples as evidenced by the better agreement obtained in both laboratories for these samples.

For retail bottled samples, the results from laboratory No. 1 indicated that the drop plate method and the standard plate count were equally satisfactory. However, the results from laboratory No. 2 were in agreement with this indication. There was no apparent reason for the disagreement between the laboratories.

It is evident that further investigation is necessary before the Mallmann surface plating technic can be accepted as an official or provisional method for the bacteriological examination of milk supplies.

A COMPARISON OF OTHER PROPOSED PLATING TECHNICS WITH THE STANDARD PLATE COUNT

This subcommittee consisting of J. C. McCaffrey, *Chairman*, and C. K. Johns, made a limited comparison between the Astell Toll Tube technic and the standard plate count, and the Bacto Strip technic and the standard plate count.

The Bacto or paper-strip process developed by Forg in 1955 has received wide acceptance in European countries but is still somewhat of a curiosity on our continent. The basic principle of this process is the use of a dry paper strip which has been impregnated with a specific medium, sterilized, and kept in a sterile plastic envelope. The paper strips are so standardized that when inserted into a container of milk they will absorb a certain definite quantity of fluid. The inoculated strips are incubated for either 8 to 10 hours or 12 to 15 hours, depending upon the type of medium used.

Twenty-nine samples of bottled pasteurized milks were examined for the presence of coliform organisms using the standard violet red bile agar procedure and paper strips impregnated with violet red bile broth. Seven of these samples showed higher coliform results with the paper strip method while 6 showed higher results with the standard violet red bile agar plate method. The remaining 16 samples showed identical results.

While it is realized that 29 samples do not constitute a satisfactory criterion for determining the suitability of a method, the results indicated that the paper strip method compares favorably with the accepted standard pocedures. It has several advantages in that pipettes, Petri dishes, and other glassware are eliminated. The paper strips, protected from light, can be carried in the inspector's pocket and can be used to conduct ambulant tests in dairy plants. An apparent disadvantage is the incubation time, which in many instances does not fit in with the normal laboratory routine.

The Astell Roll Tube Technic, which originated in England and has been widely used on the European continent for many years, but has, up to the present time, received very little acceptance in this country, was applied to 58 pasteurized fluid milk and cream products along with the standard plate count procedure. The Astell Roll Tube Technic consists of adding 0.5 ml. of the liquid to be tested to a small bottle containing 4.5 ml. of melted agar. The bottle is placed on a spinning apparatus which allows a spray of water to impinge on the surface of the bottle as it spins. The agar solidifies in an exceedingly thin film over the internal surface of the bottle. The bottles are incubated for 48 hours in an upright position and the resultant colonies are counted on a special type of a colony counter.

To determine which of two methods yielded the higher count it was decided that if the lower count observed (by either method) was 80% or more of the higher count, then the two methods would be con-

sidered to give equivalent results. If the lower count, on the other hand, was less than 80% of the higher count, then the method giving the higher count was considered to be significantly better. In other words, there was considered to be no difference between the methods unless the lower one was less than the higher by more than 20% of the higher count.

Twenty-seven samples of pasteurized "cream-top" Grade A milk were examined. The standard plate count for 6 of these samples were significantly higher than the roll tube count, while the Astell Roll Tube count was significantly higher for only 1 sample. Counts were identical for 20 samples.

Sixteen samples of pasteurized homogenized milk were examined. Four of these yielded standard plate counts higher than the roll tube counts and 12 gave the same count by both methods. Eight samples of pasteurized coffee cream were examined. Two of these gave standard plate counts higher than tube counts, and 6 gave the same count by both methods. Of seven samples of pasteurized half and half, 1 yielded a standard plate count higher than the roll tube count, while 6 samples gave the same count by both methods.

In view of the fact that 44 of the 58 samples examined yielded identical results by both methods, it would seem that the Astell Roll Tube technic is worthy of further consideration by this committee since several advantages over the standard plate count have been claimed for it. The Roll Tube Method is said to be much more economical since it is claimed that laboratory and media costs are reduced and that less incubator space is needed. Also, the risk of contamination should be materially reduced.

For the next year the Applied Laboratory Methods Committee plans to carry out additional laboratory research on the Astell Roll Tube Technique and the Bacto Strip process as well as other problems suggested by members of the Association.

J. C. McCaffrey, Chairman, Illinois Association
F. W. Barber, New York State Association
B. M. Barney, Memphis, Tenn.
R. N. Costilow, Michigan Association
W. E. Glenn, Tri-City Milk and Food Sanitarians, Louisville, Kentucky
J. J. Jezeski, Minnesota Association
C. K. Johns, New York State Association
W. C. Lawton, Minnesota Association
E. W. McFarren, New York State Association
W. K. Moseley, Indiana Association
W. S. Mueller, Rhode Island Association
R. B. Parker, California Association
H. B. Richie, Illinois Association
G. W. Shadwick, Illinois Association
D. I. Thompson, Wisconsin Association of Milk and Food Sanitarians
H. H. Weiser, Ohio Association

NEWS AND EVENTS

ANNOUNCEMENT

A course in Epidemiology and Control of Food Borne Disease will be offered at the Communicable Diseae Center, Public Health Service, Atlanta, Georgia, May 19-23, 1958.

Designed to provide public health workers with current information on prevention and control of food borne disease, the course is offered for physicians, veterinarians, laboratory workers and enivronmental health personnel and others who work in the general field of food control. Preference will be given to persons whose professional duties involve the application of epidemiological technique in the field. Information and application forms may be obtained from, Chief, Communicable Disease Center, 50 7th St., N. E. Atlanta 23, Georgia.

ANNOUNCEMENT

The Seventh Southern Municipal and Industrial Waste Conference will be held at Duke University, Durham, N.C., on May 1 and 2. The course is under the auspices of the College of Engineering. The general theme of the Conference will be, responsibilities and challenges in the field of sanitary waste control. Persons interested in obtaining more detailed information should correspond with Professor J. W. Williams of the Duke University College of Engineering.

IDAHO ASSOCIATION APPOINTS 3-A STANDARDS LAISON COMMITTEE

The Idaho Association of Sanitarians, at their annual meeting, held on March 6, 1958, appointed a committee to cooperate with the Committee on Sanitary Procedure of this Association and in turn give laison assistance to the 3-A Sanitary Standards Committee.

The purpose of the Idaho committee is threefold. First, to present material, pose questions and call attention to any irregularities encountered which may not be in accord with established 3-A Standards. Secondly, to report to the membership of the Idaho Association, recommendations, actions and procedures resulting from actions taken by the parent 3-A group, and, third, to cooperate in the promotion of 3-A standards in Idaho and assist in acquainting industry with the advantages of using equipment which meets construction and sanitary requirements as promulgated and publihed by the parent 3-A Committee.

President Jack Jelke then appointed a 3-A Standards committee consisting of the following Idaho members: Keith Harvey, chairman, Ken Poole and Rulon Tueller.

ARTHUR S. DICK, JR., PASSES AWAY

Arthur S. Dick, Jr., of Evansville, Indiana died March 22, following surgery. Mr. Dick was supervisor of the food control section of the Vanderburgh- Evansville Department of Public Health. He had been associated with the Evansville Department for some ten years and had served as supervisor of food control during the past four years. He was well known among the members of the Indiana Association and took an active part in its affairs. Both the Indiana Association and International have lost a staunch friend and active member, and it is with regret that his death is reported.

CLARENCE J. BABCOCK DIES

Clarence J. Babcock, long time leader in milk marketing, died in Washington, D.C. on February 25. Mr. Babcock, at the time of his death was Director of the Foreign Agricultural Service's Dairy and Poultry Division, U.S. Department of Agriculture. He joined the Department in 1917 serving continuously until the time of his death. A native of Medina County, Ohio, he graduated from Ohio State University in 1916 with a B.S. degree in agriculture. During World War II he was commissioned as a Lieutenant Colonel in the U.S. Army Sanitary Corp and was in charge of milk supply sanitation.

Mr. Babcock was a member of the American Dairy Science Association, the International Association of Milk and Food Sanitarians, and the Dairy Technology Society of Washington, D.C., and Maryland. As a member of International he served a number of years on the Association's Committee on Ordinances and Regulations. "C. J." was well know and respected by his fellow members of our Association and it is with deep regret that we note his passing.

LACK OF ADEQUATE DIET CALLED NATIONAL HEALTH PROBLEM

Speakers at the National Food Conference held recently in New York stated that food fads, freak diets and a lack of knowledge of good nutrition are creating one of the nation's major health problems. Charles B. Shuman, president of the American Farm Bureau Federation stated that, "The fact that the United States is the best fed nation in the world should not blind us to well supported evidence that hundreds of thousands of Americans are failing to eat balanced, nutritious meals." He reported that 29 percent of American household are not obtaining the amount of calcium recommended by the National Research Council; 25 percent do not get enough vitamin C and 19 percent not enough riboflavin.

Leaders in education, industry, nutrition, medicine, labor, family living and from other fields attending the conference reviewed research findings about the nation's eating habits to discuss means of focusing public attention on defeciencies and to devise ways of improving nutritional habits.

While the press does a good job of reporting the wealth of information developed through colleges, universities, research foundations and the food industry, there is still an urgent need for a continuing drive to get the facts about food and the importance of good nutrition to the attention of the nation's families.

The Conference was sponsored by the major food industries and farm groups as a public service.

AMERICAN DAIRY ASSOCIATION ANNOUNCES THREE NEW RESEARCH PROJECTS

Three new research projects — two to study feed flavor in milk and one to study the effect of moderate and low-fat weight control diets on persons between the ages of 40 and 60 — are getting under way through sponsorship of the American Dairy Association.

One of the milk-flavor studies will test the effectiveness of vacuum processing for eliminating weed and feed flavors from milk. It is being conducted by A. W. Rudnick, Jr., and T. R. Freeman at the University of Kentucky.

The other milk-flavor study will examine the chemical and physical properties of compounds responsible for feed flavors in milk, in an effort to find a means to eliminate these flavors. It is being conducted by Dr. W. M. Robert of the University of North Carolina.

The low-fat diet study, being carried out by Dr. Robert E. Olson at the University of Pittsburgh, is part of a larger project on weight control diet and the association also voted to continue twelve other projects on cholesterol levels when dairy products make up a significant part of the diet.

All of the new projects were adopted by the American Dairy Association at its recent Executive Committee meeting in Tulsa. At the same meeting, the association also voted to continue twelve other product and nutrition research projects. These cover a wide range of nutritive studies, including several on the relationship of fats to heart disease. Four of the twelve renewed projects ar being administered by the National Dairy Council.

PYROCERAM — NEW DEVELOPMENT IN GLASS LIKE MATERIAL

The Corning Glass Works has reported the development of a versatile new substance, Pyroceram, that is harder than steel and lighter than aluminum. The first practical use of Pyoceram will be in radomes, the nose cones that protect the directional instruments in guided missiles.

Pyroceram starts out as glass and is melted and fashioned in the same way. But each batch of raw material includes chemical ingredients that contain a nucleating agent, which, under heat treatment, forms crystals. Glass is noncrystalline, whereas, Pyroceram is crystalline.

The new material can be cast like metal in a foundry, thus allowing the fabrication of large and complex shapes. The substance is extremely hard and fine grained. It can be made transparent or opaque and, by controlling the chemical composition and growth of the Pyroceram crystals, material of widely differing properties can be produced. Pyroceram was invented and developed by S. Donald Stookey, manager of Corning's chemical research department.

APHA RECEIVES FINANCIAL GRANT FROM FOUNDATIONS

Grants of $150,00 each have been made to the American Public Health Association by the Rockefeller Foundation and the W. K. Kellogg Foundation. The announcement was made by Dr. Berwyn F. Mattison, executive secretary of the Association. The grants will aid the Association to step up its technical assistance services to health agencies and also its program of applied research in public health methods. APHA plans a $750,000, three year expansion program, and, with the two grants, half the needed sum has been raised.

AUTHORIZATION TO USE THE 3-A SYMBOL

Following is a list of concerns to which 3-A Symbol Council authorizations to use the 3-A symbol have been issued since publication of the list in the February 1958 number of the Journal. Those identified thus (*) are recipients of newly-issued authorizations. The other concerns listed have had their authorization certificates amended because of change of firm name, change of address, or addition of model numbers.

This list supplements other listings published in earlier issues of the Journal.

AUTHORIZATION NUMBER	CONCERN AND ADDRESS	MODEL NUMBER
	FITTINGS-SANITARY	
89	*Universal Machining Co., Inc. 6615-28th Avenue Kenosha, Wis.	63-GT-1½ 63-FT-1½
	HEAT EXCHANGERS — PLATE TYPE	
14	Chester-Jensen Co., Inc. 5th and Tilghman Sts., Chester, Pa. Transferred from: York Division — Borg Warner Corporation York, Pa.	No change in model numbers
	TANKS, FARM HOLDING AND/OR COOLING	
94	*Esco Cabinet Company West Chester, Pa.	BW: 150, 200, 240, 300, 350, 425, 475, 500, 650, 800, 1000
55	Haverly Equipment Div. — John Wood Co., First Street Royersford, Pa. Address changed from: 208 South Geddes St., Syracuse 4, N.Y.	No change in model numbers
57	The Pfaudler Co. — A Division of Pfaudler Permutit, Inc. 1000 West Avenue, Rochester 3, N.Y. Title changed from: The Pfaudler Co.	Model numbers: J DS: 15, 18, and 20 discontinued. DS: 25, 180, 250, and 400 added.
	TANKS, AUTOMOTIVE TRANSPORT OR PICK-UP	
93	*Pennsylvania Furnace and Iron Co. 316 Pine Street, Warren, Pa. *Errata* — L. C. Thomsen Sons, Inc., should have been No. 73 rather than 78 Damrow Brothers Co., No. 76 was for storage tanks, not automotive transport tanks	List of model numbers on file.

These corrections should be made to list published on pages 55 and 56, February 1958 issue of Journal.

NEW YORK CITY STUDIES FOOD ADDITIVE LEGISLATION

Proposals for fundamental changes in legislation governing the use of chemical additives in foods are being studied by the New York City Board of Health. Under present Sanitary Code requirements, additives may be used in foods until they are proven unsafe or harmful. Under existing regulations the Department of Health may not ban use of an additive unless it can be proven that the additive used is injurious to health. Under proposals being currently studied, an additive could not be used or placed in food until the food processor submits substantitive proof to the Department of Health that the substance intended for use is safe and harmless.

The Board recognizes that certain additives used in food may have nutritive qualities or may improve and enhance the texture and palatability of food. Cited are such additives as vitamins and minerals used in milk and bread; pectins and gums added to jams and jellies, and calcium salts, alum and phosphates used in pickling and in the canning industry. Fresh fruits and vegetables, including oranges, potatoes and cherries are sometimes treated with coal-tar colors in an effort to add to eye appeal.

The first draft of the additive proposal is being prepared under the direction of the Legislative Drafting Research Fund of Columbia University. Before the new Sanitary Code section dealing with additives is put into final form for Board action, the Department will discuss the proposed legislation with food processors, chemical manufacturers, experts in food and drug control and with interested trade associations. Undoubtedly when such regulations are in final form they will be used as a guide by other municipalities who look toward food law revision.

IKE'S YOUTH FITNESS LEADER ASKS DAIRY INDUSTRY SUPPORT

Shane MacCarthy, Executive Director of the President's Council on Youth Fitness, addressed a group of dairy industry leaders at a "Youth Fitness" dinner Washington, D.C., March 27.

MacCarthy called on the dairy industry to lend support to the move to improve fitness of young Americans through its public relations and promotion programs. He urged the dairy industry to sell milk and dairy products as the "Food for Fitness."

The Council director, who was appointed by President Eisenhower two years ago, suggested that the dairy industry implement the President's national program by activating local youth fitness committees. He pointed out that the Council has received staunch support from the cereal manufacturers, who are developing a program to increase interesting physical achievement among American youth.

The dinner was sponsored by the Milk Industry Foundation in connection with a meeting of its Executive Committee.

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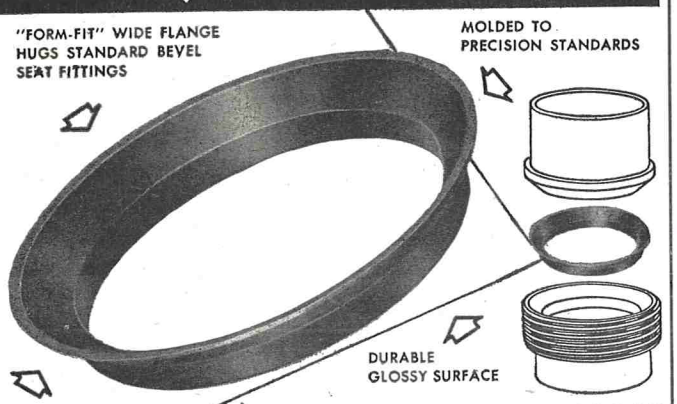

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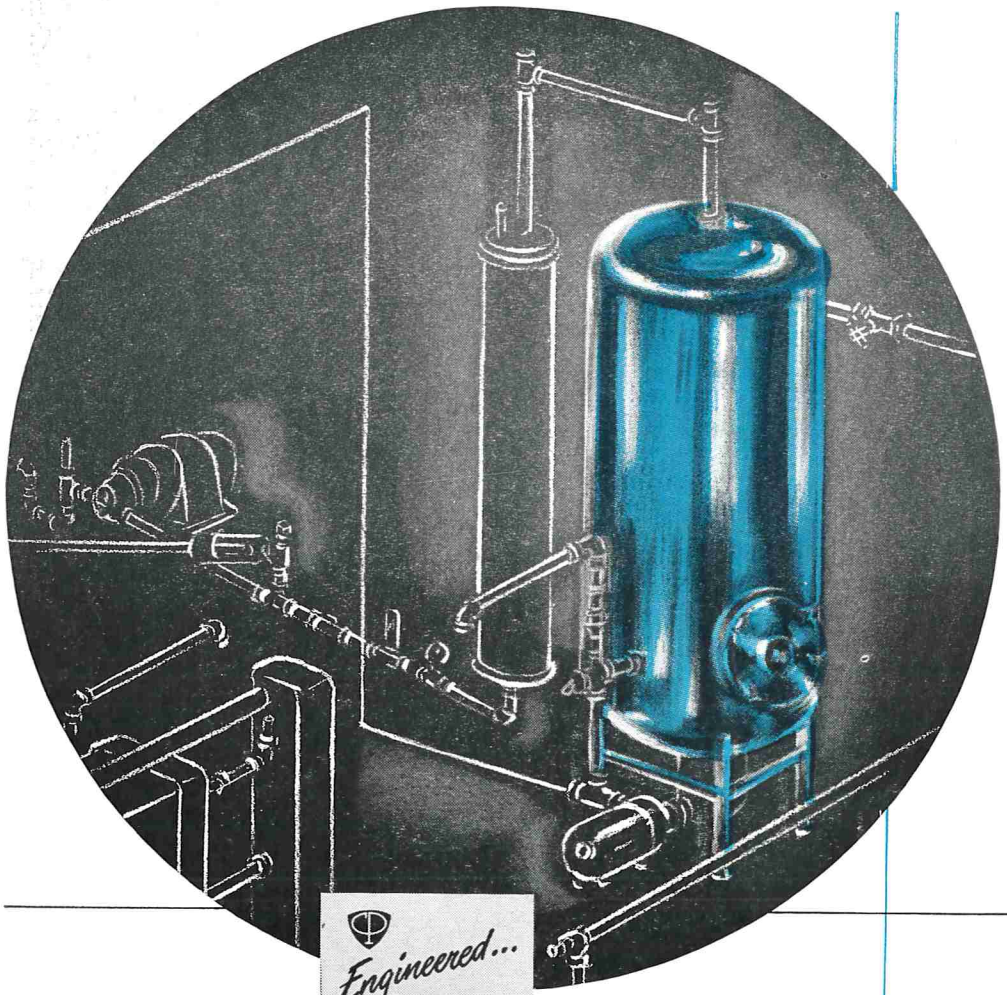

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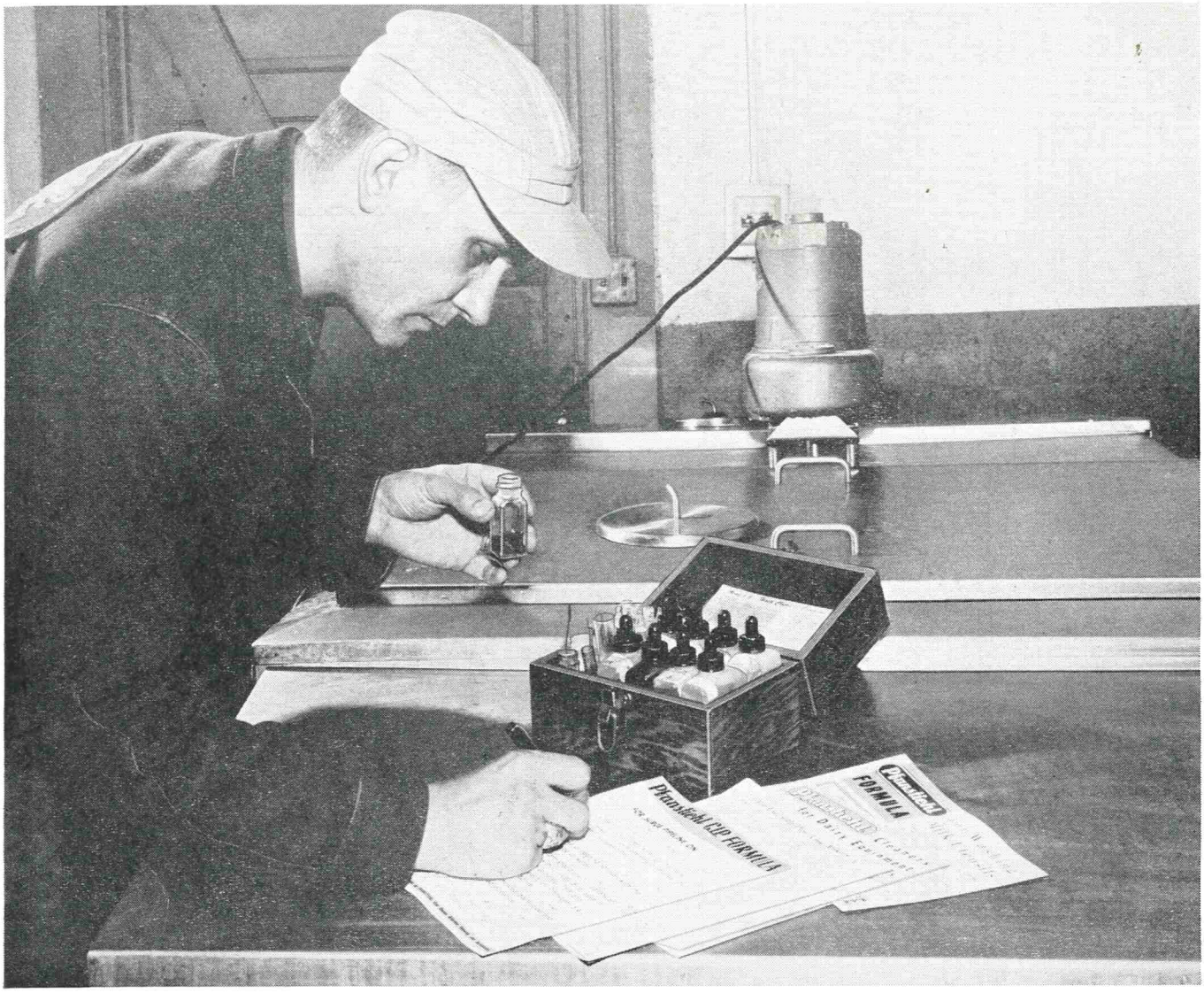

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