PROGRESS ON QUALITY CONTROL IN THE EVAPORATED MILK INDUSTRY

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Accomplishments of the Sanitary Standards program of the evaporated milk industry are reviewed. Success of this program is indicated by acceptance by other agencies, quality of field work, farm sanitation, milk quality, plant sanitation, and support of the industry. The Sanitary Standards Code is under continuous review, and amendments are adopted as needed. The program is supervised by a Sanitary Standards Committee, composed of industry officials, and is administered by a staff of trained sanitarians.

After fifteen years of intensive work on farm and plant sanitation and milk quality in the evaporated milk industry, it is appropriate to take a look at the results and the direction in which this industry-wide program is moving. Details of the program have been reported in two previous issues of this Journal, March-April, 1945 and September-October, 1948. The two papers were entitled “Sanitary Standards Program of the Evaporated Milk Industry” and “Quality Control in the Evaporated Milk Industry,” respectively.

In brief review, the evaporated milk industry adopted in 1939 a Sanitary Standards Code and an industry-wide program for implementing the Code. This Code is under continuous review, and amendments are adopted as needed. The program is supervised by a Sanitary Standards Committee, composed of policy making officials of a number of the companies in the industry. It is administered by a staff of trained sanitarians in the Evaporated Milk Association.

The Code covers all phases of plant, milk, and farm sanitation; prescribes testing and inspection procedures and standards to be followed by all plants and receiving stations; and establishes a record system for each unit on milk quality tests and farm sanitation work.

Sanitarians from the industry office periodically visit all plants and stations to evaluate the quality and efficiency of work, and to audit the records at each unit on all phases of the program. Records are maintained in the industry office to measure progress year by year, and to provide comparisons on a plant, state, and national basis. The records enable intelligent evaluation of the various phases of the work, show where changes in emphasis are needed, and afford a powerful stimulant for all plants and companies to comply with the Code. The latter is a result of competition in the industry and the fact that reports and records are transmitted directly to company officials as well as being discussed with plant management.

What have been the accomplishments of the program? This will be discussed under the following headings:

1. Acceptance of the program by other agencies.
2. Quality of field work.
3. Farm sanitation.
5. Plant sanitation.
6. Interest and support of the industry.
7. Recommendations on the elements of a sound

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and effective industry program as a result of experience in the quality control work of the evaporated milk industry.

Acceptance By Other Agencies

The Sanitary Standards program has been widely accepted by city, state, and federal regulatory officials, and the Code has been incorporated in whole or in part into the regulations of some of the states. The Code is used by the Army Veterinary Corps as a basis for evaporated milk inspection. The program has been approved by various state departments of agriculture and health and the U. S. Department of Agriculture. Officials of the U. S. Food and Drug Administration have indicated approval of the industry efforts in a unified sanitation program. The principles of the Code and many aspects of the program have been adopted by other branches of the dairy products industry.

The sediment testing methods and standards that were developed by the industry early in the program have been widely adopted, with twenty-three states using the standard grading chart. The off-bottom method, using a tester with a filtering area of one and one-eighth inches, is almost universally used on milk in producers' cans and has been incorporated into APHA Standard Methods.

The industry early took the lead in developing sanitary standards for dairy equipment. The storage tank standard was a forerunner for the 3A Sanitary Standards program and the standards for plant and farm equipment that have been promulgated by the 3A Sanitary Standards Committees. The evaporated milk industry has furnished the general chairman for this program since its organization, and evaporated milk industry leadership has contributed substantially to the success of the work.

Quality of Field Work

Perhaps the most important individual in a quality program is the plant fieldman. It is his job to make intelligent use of milk quality records in selling farmers on improvements in farm sanitation and milk production methods. He must do this while maintaining an adequate volume of milk for operation of his plant. The effective fieldman also sells farmers on improvements in economy and efficiency of milk production so as to make them better and more prosperous dairymen. This encourages them to produce more milk and better milk. This work plus high standards in the selection of fieldmen and continual training on the job have resulted in a greater professional status for the fieldmen. Farmers welcome the efforts of such fieldmen, and the results of their work are evident in continually improving milk quality, farm sanitation, and milk production efficiency. Also the fieldman is accepted as a leader in the rural area in which he works.

Most plant fieldmen in the evaporated milk industry have been trained in agricultural colleges. This background plus continual in-service training in dairy production, farm and milk sanitation, and sales principles and methods have resulted in high caliber fieldmen in the industry. Training schools are developed and held by individual companies and by the sanitarians on the industry staff. Group participation in solving field and quality problems is an important feature of the schools.

Sanitarians on the industry staff work with several hundred fieldmen during the course of the year. This enables them to evaluate the work of individual fieldmen and to advise the fieldmen by actual demonstration on how they can improve the effectiveness of their field work.

Industry records show that the accuracy and effectiveness of field work have improved constantly. This is also indicated by improved producer acceptance and interest in the work and by progress in farm sanitation and milk quality. The success of the program is also indicated by a strong demand for the industry sanitarians and plant fieldmen for other positions. Many have filled important positions in educational, regulatory, and business organizations.

Farm Sanitation

No milk or milk product quality program is complete without effective work on farm sanitation. The Sanitary Standards Code includes minimum standards for methods and facilities on farms for the production of high quality milk. Fieldmen make periodic farm inspections on all producers, plus reinspections where required, and additional farm calls as the need is indicated by substandard platform test results. The farm standards are based on fundamentals, and they have served their purpose well in milk quality improvement, producer acceptance of the program, and improvement in methods and facilities on farms.

Sanitarians on the industry staff include a survey of producing farms in each plant and station visit. This survey is made in company with the local fieldman who also inspects the farms selected and talks with the producers on improvements that are needed. Thus the survey serves a three-fold purpose. It measures conditions and progress in the field; it provides an opportunity to observe and judge the quality and effectiveness of the work of the
fieldman; and it affords a statistical comparison of the accuracy of the fieldman's work on identical farms as well as in his previous reports when working alone. Accuracy of farm inspection reports by fieldmen has been found to be of great importance in the quality and sanitation work.

The results of the surveys are tabulated for the entire industry. The records show that farm conditions which affect milk quality and the accuracy of fieldmen's reports have improved year by year. For the most part the reports by plant fieldmen can now be taken as a true reflection of the conditions existing on farms.

**Milk Quality**

The Code prescribes organoleptic examination, and bacterial and sediment testing standards and procedures which are designed to insure wholesome, high quality milk and to eliminate farms that have poor production practices. Milk which does not meet organoleptic and sediment standards is rejected, and producers who do not comply with the bacterial and farm sanitation standards received due attention of fieldmen on their problems.

Each plant maintains complete records on periodic platform tests, rechecks on substandard milk, and farm service calls by fieldmen on each producer. Milk quality is carefully checked by industry representatives on each visit to measure progress and to verify plant records.

Industry records show that sound, substantial progress has been made on milk quality. The percentage of substandard milk has decreased, and favorable results are also indicated by elimination of processing problems and improvement in quality of finished products.

The basic bacterial test used on milk from individual producers is the methylene blue test. This is a simple and reliable test for detecting poor quality milk and pointing out farms with poor methods, particularly unsatisfactory cleanliness of utensils and milking machines and poor cooling. While other tests may be needed to measure minute differences in high quality milk, the methylene blue test serves its purpose admirably in the hands of plant quality control men, and supplies adequate information for intelligent field work.

Methylene blue tests are made at least monthly on weigh tank samples of milk from each producer, and rechecks are made on substandard tests. Standard Methods are followed, and the technique is carefully checked for accuracy in all plants and stations. In one major producing state where regulatory officials make direct microscopic tests routinely and plants make methylene blue tests the two have been found to be in close agreement on detecting substandard milk.

The sediment test has also proved of great value in the milk quality and farm sanitation work, although it is recognized that farm straining of milk nullifies much of its value. However, filtering milk is a universal practice on all types of dairies and for several reasons appears likely to remain so. Nevertheless, it has been found that unsatisfactory sediment test results are one of the best means of convincing farmers to improve methods of production and handling of milk. While experts may argue about the relative merits of different bacterial tests, and farmers may misunderstand them, the sediment test disc speaks a universal language in milk sanitation and production circles. Experience in a wide variety of milk sheds and types of milk sanitation efforts, regulatory and in industry, indicates that the sediment test is worthy of much more attention and more extensive use than it receives in many areas.

**Plant Sanitation**

One of the best manifestations of an effective quality control program and the nucleus on which other phases of the work can be built is a strong plant sanitation program. A high degree of plant sanitation emphasizes to employees, haulers, producers, and consumers that management is sincere in its efforts, and it promotes interest in all phases of the quality work. A clean, well-operated plant also builds employee morale and efficiency.

Fieldmen who sell farm sanitation and milk quality to farmers need to be armed with the conviction that the milk will be processed in the cleanest, best operated plant that management can provide.

Emphasis on plant sanitation has resulted in continual improvement in plants and receiving stations throughout the evaporated milk industry. Sanitarians from the industry office make a detailed inspection of the plant or station for general sanitation and housekeeping and for repair and cleanliness of equipment on all visits. Each unit is rated on the basis of its relative excellence on housekeeping (general appearance and sanitation) and equipment cleanliness. The range of ratings is excellent, very good, good, fair, and poor.

The ratings are tabulated for the industry as a whole each year. The percentage of plants and stations earning the higher ratings has increased year by year until in 1954. 78 percent of all units were rated excellent or very good on housekeeping,
and 80 percent were rated excellent or very good on equipment cleanliness. Competition for the higher ratings has been an important factor in promoting plant sanitation to the point where it can safely be said that there is no branch of the dairy industry with plants that are superior to those in the evaporated milk industry.

**INTEREST AND SUPPORT OF THE INDUSTRY**

From its inception the Sanitary Standards Code and program have had the support and active participation of practically the entire evaporated milk industry. This includes every company presently in the industry.

With sound progress has come pride in accomplishment and leadership by the industry. Interest and enthusiasm of the industry have increased continually, from company officials to plant personnel. This comes from knowledge that the job is being well done, that leadership is being exerted in milk quality work for the entire dairy products industry and from inter-plant and inter-company competition to excel in the program.

Industry-wide participation is important to the success of a program and to consumer confidence in the product. Industry leaders know that consumer complaints and adverse publicity are harmful to an entire industry and not merely to the brand involved.

**ELEMENTS OF A SOUND AND EFFECTIVE QUALITY CONTROL PROGRAM**

In conclusion, it is believed that experience in the evaporated milk industry warrants certain recommendations on the elements of a sound and effective quality control program for any branch of the dairy industry.

Industry-wide recognition of the need for the program as well as its acceptance and support are highly important. This places all of the companies on a similar basis on the cost of such work. It is also a sound basis for building consumer confidence in the product and for maintaining free flow of the product throughout the trade channels of the country.

The program must have the active interest and support of top management of the various companies. This is necessary to maintain pressure on all plants to do the job and to bring lagging plants into line. If management delegates the job to plant superintendents without supervision and follow-through, each plant will have a different program, and industry efforts at unified quality control will fail.

Industry-wide adoption and support of a comprehensive, workable sanitation code are essential. The code should cover all phases of the sanitation job, plant sanitation, milk quality, farm sanitation, processing and handling of the product. The standards should be workable, yet high enough to accomplish the job and should incorporate sound milk sanitation principles as recognized by regulatory officials and other authorities.

In addition to supervision within individual companies, it is most important to have an unbiased system of evaluating progress at all plants across company lines. This is necessary to convince management of one company that other companies are doing the job and is important to give management of large nation-wide companies an accurate picture of conditions at their own plants. The advantages of having such reports go directly to top management rather than being snarled in intra-company channels are obvious where criticism of plant or personnel may be involved and where remedial action is required.

Complete industry-wide records are needed on all phases of the program. The records should be used to measure progress on a plant, state, company, and industry basis. The records show the status of individual plants and areas in comparison with the industry as a whole and thus serve as a powerful incentive for each company and each plant to keep up with the industry progress. Each plant must maintain complete records on periodic platform tests, rechecks on substandard milk and farm service calls by fieldmen on each producer.