Quality Control in the Evaporated Milk Industry*

E. H. Parfitt, Ph.D.

Evaporated Milk Association, Chicago, Ill.

Nearly ten years ago manufacturers of evaporated milk formed a committee of technicians and sanitarians to develop a Sanitary Standards Code. The Evaporated Milk Industry was interested in establishing on a voluntary basis standards for measuring the quality of incoming milk, standards for equipment, and standards for sanitary operation of plants. At the present time ninety-nine percent of the industry, by volume, is supporting this program. To assure progress a staff of specialists in the field of dairy sanitation were employed to assist the industry in securing the objectives of the Code.

Objectives

The objectives of the Evaporated Milk Industry’s Sanitary Standards Code are as follows:

1. To provide (for an industry that operates in 28 states) a uniform approach to the problems of sanitation as related to the plant, to processing, and to milk quality.

2. To provide definite goals and minimum sanitary standards for the entire Evaporated Milk Industry.

3. To provide a trained staff for the purpose of measuring Code compliance of each station and plant within the industry.

4. To assist companies in the problems arising as a result of the Sanitary Standards Code.

The organization work of the program is as follows:

Within each plant and station a definite procedure is established which deals with sanitation of equipment, platform tests on incoming milk, inspection of milk cans returned to the farmer, and farm inspection work done by the fieldman. The results of the above work are tabulated in a manner that will permit its easy review by members of the sanitary standards staff or public health officials.

Routine of Work

At periodic intervals members of the sanitary standards staff visit each station or plant and make a spot check on all phases of the program. The time required to make a spot check depends upon the volume of milk handled; usually it requires from two to four days. The work at the plant consists of the following:

- Detailed inspection of the plant for housekeeping, and the plant surroundings for appearance and sanitation.
- Detailed inspection of the plant equipment for repair and cleanliness. This inspection is made just prior to use of the equipment.
- Sediment testing of milk from 60 percent or more of the producers and bacteriological testing of milk from 60 percent or more of the producers supplying the plant.

The results obtained by sediment and bacteriological testing are compared with the records maintained by the plant. All plants have records which show the grades and classes found at each testing period. This procedure shows the degree that the plant or station is complying to the industry program.

Inspection is made of the platform equipment used, to determine if it is adequate and in good working order. The methods used are those given in the A.P.H.A. Standard Methods for...
the Examination of Dairy Products.

The program of the Evaporated Milk Industry sets up minimum standards for milk production methods on farms. To determine the accuracy of fieldmen's reports the staff representative visits with the fieldman randomly selected farms located on a number of different routes. The conditions observed on these farms are summarized and this summary is compared with previous farm inspections made by the fieldmen. This procedure causes uniformity of work and significantly strengthens the quality of sanitation work done by fieldmen.

This procedure results in the staff representatives working with the fieldmen in the capacity of auditor and instructor.

The staff representative, before leaving a plant, meets with the superintendent, fieldman, and others, and reviews in detail his report. The completed report, after passing through the central office, is forwarded with comments to the executive officer of the company operating the plant.

The reports are tabulated and comparisons are made of several years work. Statistical reports are prepared so that the industry's position in relation to the Code can be determined on any item.

Acceptance of the Program

The Sanitary Standard Code of the Evaporated Milk Industry has formed a basis for the development of similar quality programs in other branches of the dairy industry. The fact that standards existed in the Evaporated Milk Industry has exerted significant influence on standards and methods used by regulatory officials whose activities have been confined to bottled milk. The program was adopted at the beginning of the war by the Veterinary Corps of the U. S. Army. In addition, the standards and methods advocated in the Code have been adopted by a number of regulatory officials.

Sediment Testing

The sediment test has been employed as a major yardstick to determine milk quality. In cooperation with the Federal Food and Drug Administration, standards were formulated based upon known amounts of sediment. These standards have been accepted as state standards in eighteen states, one province in Canada, and two large cities.

The results of the sediment test are readily understood by producers whether it be in New York, Wisconsin, or Arizona. The establishment of standards that call for rejection of milk in excess of 3.0 milligrams per off-bottom pint is the most direct approach that can be taken to cause producer education in the production of an acceptable quality of milk. Sediment pads make a direct approach to the producer that can be readily understood, whether it be in New York, Wisconsin, or Arizona.

The ability to accept or reject a given can or shipment of milk from a producer has resulted in major improvements in milking methods and care of milk. This, in turn, has had its effect on quality as measured bacteriologically. The value of the sediment test as a means of measuring and improving milk quality is frequently overlooked by many milk sanitarians and this lack of interest retards industry progress.

Work of Fieldmen

The working with the individual producer is considered an important part of the sanitary standards program. There are over 500 fieldmen in the Evaporated Milk Industry. Many are college-trained men; many were formerly county agents, vocational teachers, and state dairy specialists. There is need, however, for men trained in this work. A former fieldman in the Evaporated Milk Industry has joined the staff of one of our leading universities and is now instigating a four-
year curriculum for the training of fieldmen (sanitarians) for the dairy industry.

Work with the International Association of Milk Sanitarians

The dairy industry only recently has approached the problem of sanitary standards from an all-industry point of view. The interest in the past has been with each separate branch. In the past two years an all-dairy-industry committee, working with sanitarians, has functioned and secured definite results in the development of sanitary standards for equipment of specific interest to the entire industry. One of the initiating forces of this work, on which the chairman of the Committee on Sanitary Procedure, Mr. C. A. Abele, has reported, was the sanitary standards program of the Evaporated Milk Industry.

Reaction to the Program

More fully to acquaint milk sanitarians, at all levels, with the quality control program in the Evaporated Milk Industry, there was published in the March-April, 1945 issue of the Journal of Milk Technology a paper entitled, “Sanitary Standards Program of the Evaporated Milk Industry.” The favorable comments received from sanitarians on this publication, and the favorable reaction from regulatory officials who have had an opportunity to review the program first-hand, have done a great deal to assure the success of this first national sanitary standards program in the dairy industry.

Resazurin Test and Direct Count

(Continued from page 258)

Determination tests are, in a very high percentage of the cases, of low count. Samples placed in class 4 are definitely of inferior quality, and microscopic examination should be made to determine the cause of low quality.

No attempt is made to explain the wide range in counts for samples in classes 2 and 3. Differences in reduction time by various microorganisms, failure of certain organisms to grow under the conditions provided or to stain by the methods used, and the use of a much larger sample for reduction tests (1,000 × or more) than for counting methods are recognized as factors which make impossible the direct comparison of these tests.

It is suggested that the resazurin test be used as a screening test to eliminate high quality samples from further examination and as a means of detecting the definitely low quality milk as a guide for further examination and field work.

Literature References