

## A SUGGESTED PROCEDURE FOR WASHING AND SANITIZING A SOFT-SERVE FREEZER WITHOUT DISASSEMBLING<sup>1</sup>

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Some regulatory officials insist that soft-serve freezers must be taken apart for cleaning and sanitizing after each day's operation whereas other regulatory officials believe that, when done properly, equally good cleaning can be obtained by the cleaned-in-place (CIP) method as by the disassembling method.

Although most soft-serve freezers are constructed in such a way to permit easy assembling and disassembling, a considerable amount of labor is still involved. Therefore, any additional information on how to improve the washing and sanitizing procedure for freezers cleaned-in-place should be of interest both to soft-serve operators and health officials.

This report describes a type of CIP procedure which has been evaluated in a local soft-serve establishment, where it has been successfully used for a year.

### CLEANING PROCEDURE USED

At the end of the day, after the freezer (Mills Twin-Head Model 4201-430) had been emptied, cold water was run through the hopper into the freezer, and the machine operated for just a few revolutions. After the cold rinse water had been drained off, the procedure was repeated with warm water. When the warm rinse water was discharged, the freezer was then filled with a hot (145 F) alkaline pipeline cleaner (Eastern States Farmers' Exchange) solution, containing 1 oz of cleaner to each 2 gal of water. The beater was operated for 1 min only, after which the mix hopper and the tubes (leading from the mix hopper to the freezing chamber) were thoroughly brushed with the pipeline cleaning solution. After it was left standing for one-half hour, the pipeline cleaning solution was drained from the hopper and freezer, which were then rinsed with clear warm water.

### SANITIZING PROCEDURE USED

The freezer and hopper were filled with a stabilized chlorine dioxide solution<sup>2</sup>, containing 200 ppm of chlorine dioxide. Immediately before it was added to the freezer, the solution was acidified to pH 5.5 with phosphoric acid. The addition of 2 ml of a 5% phosphoric acid solution to 1 gal of local tap water produced the desired pH. The freezer was oper-

ated for 1 min using the beater switch only. The solution was left in the freezer until it was time to start the next day's operation. After the stabilized chlorine dioxide solution was drawn off, the freezer was ready for use. It was not flushed with water because chlorine dioxide is non-toxic in the concentration used. The amount of sanitizing solution that leaked from the freezer during the long-holding period was insignificant. It is possible that a serious sanitizer leakage problem might develop with some other types of freezers. It should be noted that the total running time of the freezer, when filled with an aqueous solution, was extremely short for both washing and sanitizing. It is unlikely that this very brief period of operation would have any adverse effect on the equipment.

<sup>2</sup>Stabilized chlorine dioxide is manufactured by International Dioxide, Inc., 518 Fifth Avenue, New York, N. Y. This product remains in stable solution until the chlorine dioxide is released under control by acidification, at which time it becomes free chlorine dioxide available to perform the function for which it is intended.

### RESULTS

The washing and sanitizing procedures previously described were found to be satisfactory when used on a stainless steel, soft-serve freezer (Mills Twin-Head Model 4201-430) for a period of one year in a soft-serve establishment. This was even true when the freezer was used for making ice creams containing fibrous fruits, such as pineapple, strawberries, etc., which make cleaning very difficult.

Frequent checks for cleanliness were made during the test period by taking the freezer apart, swabbing and making visual observations of the swabs. Frequent checks were also made of the sanitary condition by the water rinse method, and by the swab contact method (as prescribed in *Standard Methods for the Examination of Dairy Products*, 11th Edition 1960). The swab tests included areas such as front bushing under the blade and near the rear bearing. Coliform counts were negative when the freezer was checked according to Standard Methods. In all instances, the water rinse test method indicated less than one colony per ml of freezer capacity. The swab contact method indicated less than two colonies per cm<sup>2</sup>.

Product samples were also checked monthly by a commercial laboratory for coliform and total bacteria content. The coliform count was always far below the widely-used standard, not exceeding 10 per g

<sup>1</sup>A contribution from the Massachusetts Agricultural Experiment Station, Amherst.

in three out of four samples. The average bacterial plate count per g was always far below the widely-used standard, not exceeding 50,000.

The rapidity of germicidal action of stabilized chlorine dioxide increases as the pH is lowered. Its action is much slower than that of hypochlorite at a pH of 5.5, but this is of no consequence because the sanitizing agent is left in the freezer overnight.

One significant advantage of stabilized chlorine dioxide over hypochlorite as a sanitizing agent is that it is less corrosive. The stainless steel freezer showed a very slight and unobjectionable tarnishing during the one-year period of its use.

While it has been demonstrated that a soft-serve freezer can be satisfactorily washed and sanitized without disassembling each day, it is still advisable to take the freezer apart occasionally to check for cleanliness and corrosion.

Various types of stainless steel, varying in corrosion-resistance, are used in the manufacture of freezers. The composition, such as chromium, nickel

and molybdenum content, and also surface finish are known to affect the corrosion-resistance of stainless steel. This study did not encompass the corrosion-resistance of various types of stainless steel to the pipeline cleaner and sanitizer used. Therefore, it cannot be positively stated at this time whether a particular freezer is suited to the treatments prescribed. Should a soft-serve operator wish to use the cleaning and sanitizing procedure herein described, a close check for the first signs of corrosion would be advisable. This would avoid serious corrosion damage in the event that the freezer in question proved unsuited to the washing and sanitizing procedure we have described.

In conclusion, it does not seem fair that a conscientious and painstaking soft-serve operator (one who can produce a sanitary product without taking the freezer apart each day for cleaning and sanitizing) should be penalized by having to conform to regulations which were designed mainly for the careless operator.

### FARM TANK INCREASE CONTINUES

The eleventh annual Farm Milk Tank Survey, conducted by the Bulk Tank Market Action Committee of the Dairy and Food Industries Supply Association, shows 217,823 farm tanks installed and in use in the United States as of January 1, 1966. The U. S. figure represents an increase of 12,569 in a 12 month period. Canadian figures indicate a total of 17,843 farm tanks installed and in use as of January 1, 1966, an increase of 4,575 in the past year.

The widespread adoption of the farm bulk system of milk handling has been one of the most rapid and revolutionary changes within the dairy industries in recent years. Reviewing U. S. figures and using the survey date of January 1, three years ago (1963) there were 193,580 tanks, six years ago (1960) there were 140,785 and ten years ago (1956) the total was 29,885. The big milk producing areas in the U. S. and Canada, of course, lead in the number of tanks in use. The ten leading states and provinces and the counts for each on January 1, 1966 are as follows: Wisconsin (31,024), Minnesota (21,000), Ohio (14,960), New York (14,578), Michigan (12,475), Illinois (11,337), Ontario (10,653), Pennsylvania (9,770), Iowa (7,987) and Indiana (7,887).

Interestingly, California, a very large milk producer utilizing unique "factory-type" production methods particularly in the southern area, nevertheless ranks 16th with 4,441 farm bulk milk tanks. By contrast, Florida, a big fluid milk consumer relying

to a great extent on big producers, had only 836 tanks in operation. Hawaii had 55 tanks and Alaska 41 tanks and in each case this was less than the figures reported a year earlier.

### MICHIGAN IMPROVE CONTROL OF CRACKED EGGS MARKET

Further steps to prevent movement of cracked eggs into consumer channels became effective in April, 1966, through amendment to the state egg law of 1963. "The purpose is to eliminate the hazard of food poisoning traceable to several types of organisms associated with eggs," said J. L. Littlefield, chief of the Michigan Department of Agriculture's Food Inspection Division.

Under the amendment now effective, no dealer may offer cracked eggs for resale except to a licensed egg-breaking plant. Any egg producer, however, may sell cracked eggs to egg grading stations, egg breaking plants, or directly to a consumer for his own family use. This prohibits movement of cracked eggs in the shell to bakeries, institutions, restaurants, hotels or any other eating or processing establishments. This practice was permitted in the past until the law was amended.

By strict controls in the hands of the Michigan Department of Agriculture, cracked eggs move only to licensed egg breakers who are equipped to eliminate the hazard in liquid eggs or frozen eggs.