Many sanitation problems have accompanied the rapid growth of the bulk dispensing method of serving milk. Because of the rapid development of the bulk system of dispensing milk the answers to all of the many problems, unfortunately, are not readily available. But until such time when sanitary equipment standards and time-proven operating and handling procedures are developed, the suggestions here should be of immediate practical value to the many sanitarians who are responsible for milk dispensing operations at the present time.

The number of cafeterias, restaurants, and similar food establishments adopting the bulk dispensing method of serving milk is increasing rapidly. Since this method of milk distribution is still in its infancy—and subject to growing pains—there are many problems to be overcome with respect to sanitation requirements. Fortunately, these problems are not insurmountable and can be overcome by cooperation of all concerned—the dispenser manufacturers, the milk processors, the food establishment operators, and the regulatory agencies.

The bulk milk dispensing system of merchandizing offers some distinct advantages for the dairy industry. In general, it is more economical. Also, most people find milk more palatable when served very cold, and consumers generally obtain it that way from a bulk dispenser. This has been attested by food establishment operators who claim milk sales have been increased after installing a bulk milk dispenser. This being true, bulk milk dispensing is no longer afad; it is here to stay. It becomes the sanitarian’s responsibility to recognize that this revolutionary method of milk distribution appears to be another important advance by the dairy industry in recent years which might well rank with such things as pipe line milkers, permanent pipe lines, cleaning in place, farm holding tanks, tank truck pick-up, and others. Therefore, sanitarians should be interested in understanding the practical aspects of the problems which might be encountered in their daily work.

In general the sanitation problems of bulk milk dispensing are the same as those of handling milk in any other recognized manner. It is still a matter of using clean utensils kept in good repair, clean handling of both containers and milk, and proper protection of the contents from contamination and adulteration until the milk is consumed.

Sanitation problems frequently occur during bulk milk dispensing operations because of number of people and materials involved. Problems occur during this operation as the homogenized milk is processed and placed in a can at the plant, carried by plant personnel to the food establishment, and placed in an approved dispenser in such manner that the personnel of the food establishment can withdraw the contents without disturbing the container.

**Type of Can**

The cans used generally are 2½, 5, or 10-gallon size. At the present time most milk cans in use are of the tinmed variety. Few stainless steel cans are in use today. The use of stainless steel, however, should be encouraged for very practical reasons. Close examination of some of the cans in current use reveal that the cans have been subjected to severe abuse. From a sanitation point of view most cans do not compare well with glass bottles or paper cartons used for distributing the final pasteurized product.

In most food establishments a greater number of cans of milk are delivered than may be placed in the dispenser. The extra full cans of milk usually are stored in an adjoining walk-in type refrigerator. When the cans in the dispenser are replaced, the empty cans are held at room temperature until they are picked up later by the person who delivered the milk. During this time the cans are held at temperatures favorable for acid-producing organisms to grow readily in the small amount of milk that remains in the can. Since acids attack the tinned metal cans we may assume the cans will not remain in a suitable sanitary condition for very long.

One solution to this problem has been to keep the cans refrigerated at the food establishment until they...
Rinsing Returned Cans.

BULK MILK DISPENSING

are picked up. Immediately upon return to the plant the cans should be thoroughly washed. Also, each can should be checked carefully while being washed, eliminating from use those cans which have broken seams or rust spots. As these cans are replaced with those of the stainless steel type, the problem will be significantly reduced. To hasten the solution to this problem it may be well to consider the possibility of condemning any unsuitable types of cans for bulk milk dispensing, including tinned cans.

CANS.

When cans are to be used the next day after return to the plant, they should be re-washed and sanitized just prior to use. Final sanitizing should be done just before the cans are filled with milk. But the question is, what method should be used for washing and sanitizing?

Attempts to clean and sanitize cans in conventional rotary or straight-away can washers have proven unsatisfactory. Adequate cleaning and removal of soil is not always obtained. Such cans cannot be sanitized properly. Also, the cans which are to be filled with pasteurized milk might be washed in can washers previously used for cans which contained raw milk.

A hand cleaning and sanitizing method which has been found satisfactory for both cans and lids is as follows: (1) Thoroughly rinse the cans with tap water. (2) Hand-brush in sink of warm water containing a good cleaner, or use a mechanical-powered can brush which is preferred for hard-to-clean cans. (3) Rinse in hot water in a second sink. (4) Sanitize in a third sink with a suitable sanitizing agent equivalent in bactericidal action to a solution containing not less than 100 ppm available chlorine.

The nipple on the bottom of the can must be thoroughly brushed with a proper size brush. A further precaution is to have a steam jet arrangement at the end of the third sink for one-minute steaming of each can and lid. To insure adequate steaming a rotary hand valve is recommended instead of a foot-pedal valve which might tend to influence the operator to cut short the length of time of the steaming operation. Thorough steaming is excellent insurance for complete sanitization.

ROLLING CAN RACK

The plant engineer can easily fabricate a useful can rack from galvanized pipe. The size will depend upon the number of cans, and the width and height of doorways. The rack may be mounted on wheels for easy moving. As soon as the returned cans are washed they may be inverted on the rack for draining and storage. The rack of cans may be rolled to the various stations as required for washing, storage, re-washing, sanitizing, and filling. A strong shelf, 18 inches from the floor, may be mounted on one end of the rack to be used later for holding cans during the filling operation.

ATTACHING THE RUBBER TUBES

The rubber tubes through which the milk is dispensed should be cut with a blade having a sharp cutting edge which has been carefully sanitized. For cutting, the tube should be placed on a metal table which has been recently sanitized. The glacine wrapper on the dispensing tube should be allowed to

Washing of Cans.

Sanitization of Cans.
Filling of Tubes.

remain intact on each of the tube halves. Immediately after the can is sanitized the rubber tube should be placed on the nipple of the can and secure in the clamp on the bottom of the can. The can then may be set down on the can-holding shelf of the can rack. Place the sanitized lid on the can to await being filled.

Filling the Cans

There is greater variation in methods of filling cans than in any other phase of the entire operation. The filling of these cans—being a hand operation—is a departure from the usually accepted and approved practices considered necessary for complete protection of pasteurized milk. Possibly it is a concession made by regulatory officials for lack of anything better. Every possible precaution should be observed during the filling operation.

Any method which exposes the milk to possible contamination should be avoided. Cans should not be filled by lifting them up to the nipple leading out of the trough from cooler boards. They should not be filled by using badly pitted aluminum releaser pipes placed on a valve of the bottle filler. They should not be partially filled with a short nipple, followed by dripping off the foam, and then completing the filling using a pitcher or pail of some type. Filling several cans at a time and permitting them to sit open until the foam is dripped off or settles and then refilling them should be avoided. Such careless methods of filling cans do not afford the maximum protection which should be achieved.

Some plants are using a procedure which affords about as much protection as possible with the hand-filling method. In this procedure a valve with the elongated can-filling nipple is used which reaches to the bottom of the can. Such arrangement reduces foaming to a minimum and permits complete filling at one time. A plastic or stainless steel drip-diverting apron is used on the valve. Such apron completely covers the top of the can and protects the milk from drippage and foreign materials. This apron is located on the elongated nipple not more than four inches above the top of the can during the filling operation. As soon as the can is filled, the nipple is raised and the can moved to one side of the can shelf, which is large enough to hold two cans. The can is covered immediately with a parchment and the lid is pressed on tightly. Be sure the parchment paper used to cover the top of the can has a hole approximately one-eighth inch in diameter in the center. Such parchment papers can be purchased with the hole already punched in them. A hole is necessary to permit air replacement of liquid as the milk is drawn out of the dispenser. Without a hole in the parchment the milk may not flow out of the tube satisfactorily.

Storage and Handling

After the cans are completely filled they should be placed im-
Sealing the Can

Each can of milk should be sealed with two wire seals on opposite sides of the can lid before leaving the plant. Sanitarians are advised to reject any milk found in a can if either seal has been broken. This is necessary for the protection of both the dairy operator and the consumer. Generally operators of food establishments would not tamper with the contents of these cans of milk. But at least one case has been observed in which an operator was mixing homogenized milk and reconstituted nonfat milk together which was being sold as whole milk. So it seems essential that the cans are sealed at the plant and remain sealed until returned to the plant.

A tag should be placed on each can bearing the name of the processor, identification of the contents, and date the milk was placed in the can. The milk should be completely used within four days after the date on the tag or should be removed from the dispenser. Dairy plant operators should avoid delivery of too much milk to a given establishment at one time. The use of dispensers should be permitted only in establishments which handle sufficient volume of milk to warrant the use of a dispenser.

Dispensing Precautions

There are precautions to be observed in the dispensing of the milk at the food establishment. Employees should be instructed thoroughly on how to avoid contamination of the tube with their fingers. The dispensing tube should be firmly pulled through the valve, after which the valve should be seated and lifted several times. This procedure is necessary so that the tube becomes fixed in the proper position and will not later tend to draw back into the valve. The tube should be cut with a sharp cutting edge of a clean cutting instrument. A good procedure is to keep a supply of new razor blades near the dispenser and use a newly unwrapped one each time, discarding after a single using. The end of the tube should be cut off exactly one-fourth inch from the valve. It is not desirable to cut too close to the valve, allowing the milk to come into contact with the valve. On the other hand, if the tube is too long, there is greater possibility of external contamination. Warning on the end of an excessively long tube end may permit microorganism growth. It is claimed that flies
will not land on a cold tube but will alight on a tube which has been permitted to become warm.

Manufacturers of dispensers would do well to redesign dispenser valves with a protective shield over the end of the tube which would automatically move aside as the milk is withdrawn. After an empty can is removed from the dispenser the inside of the cabinet and the dispensing valve should be cleaned and sanitized before the next can of milk is placed into the cabinet.

A recent investigation indicates the value of careful consideration of the above details by food establishments. It was observed that one food establishment was more careful about its care and attention to sanitation details than was the other. The 5-gallon cans of milk being delivered to the two establishments were from the same processor. Laboratory samples were collected from both establishments on the same days, and the cans had the same date tags. In Table 1 are listed the bacteriological results obtained during a two-week period.

**SUMMARY**

Careful consideration of dispenser manufacturers, milk processors, and food establishment operators is needed to solve the problems which might occur through the use of bulk milk dispensers for the distribution of milk. Each has a specific responsibility to put into practice the best known materials and methods considered essential for the sanitary handling of milk, and to comply with all known regulations, requirements, and accepted procedures. The sanitarian's responsibility is to educate, encourage, execute, and enforce suitable sanitary methods and procedures that will promote public health for the safety and welfare of mankind.

### COMPARISON OF ESCHERICHIA COLI

Continued from Page 206


34. Rogers, L. A., Clark, W. M., Evans, A. C. The Characteristics of Bacteria of the Colon Type Occurring on Grains, Ibid. 17, 137-139, (1915).


### OAKITE PUBLISHES MAINTENANCE CLEANING GUIDE

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