

## DRIVER TRAINING AND LABORATORY PROBLEMS IN THE BULK TANK PICK-UP OPERATION<sup>1</sup>

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Much has been published relative to the bulk tank system of milk procurement. Certain aspects of this system such as costs, every other day *vs.* daily pick-up, fat tests, methods of financing and many others have been emphasized. While many groups have recognized the importance of the tank truck driver or hauler, little has been published relative to a comprehensive training procedure. To ensure the collection of proper samples and proper operation of a bulk tank route, the man holding the job must be reliable and be thoroughly trained. In this article an outline and discussion of a training procedure that has proven to be satisfactory is presented.

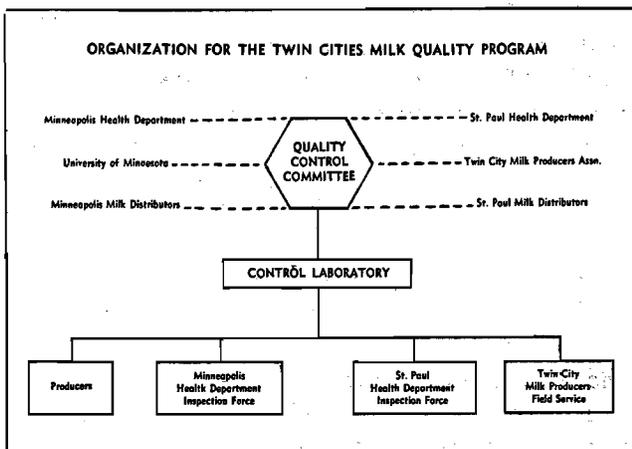
### ORGANIZATION OF THE QUALITY PROGRAM

Since the nature of the laboratory which is responsible for collection and analysis of samples and reporting results in the Twin City area is unique in its organizational structure, a brief summary of its relationship to the general program of the two city health departments follows. The laboratory is sponsored by a Quality Control Committee consisting of representatives of six organizations: The St. Paul Milk Distributors; the Minneapolis Milk Distributors; the Twin City Milk Producers Association; the Minneapolis Health Department; the St. Paul Health Department; and the Dairy Department, University of Minnesota. The accompanying chart illustrates the organization of this committee, its relationship to the control laboratory and the inspection and field



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service program. The basic role of the Quality Control Committee is to assist in coordinating milk quality control efforts of producers, distributors and health departments. Financial support for the operation of the laboratory is provided by the Twin City Milk Producers Association and the Minneapolis and St. Paul Milk Distributors. It should be emphasized that the committee is a coordinating one and the autonomy of the health departments or any other organization involved in the Twin City milk supply is not impaired in any manner. The program is simply a cooperative effort designed to supply the citizens of St. Paul and Minneapolis with a high quality milk supply. A more complete discussion of the organization and work of this program has been published elsewhere (1, 2).



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### DEVELOPMENT OF THE TRAINING PROGRAM

In the fall of 1954 the members of the Twin City Milk Producers Association, who ship the major share of fluid milk into the Twin City market, voted to

convert 100% to bulk tank pick up of milk. This change in system of milk procurement brought with it many problems not previously encountered under the can delivery system. The problem of most concern to laboratory personnel and the health departments was the method to be used for securing proper samples and keeping them in satisfactory condition until they could be analysed. Under the can delivery system, samples were obtained at the receiving platform of the plants and were taken directly to the laboratory. With the introduction of the bulk tank pick-up system this procedure was no longer possible, therefore, an alternative system was developed for use in this area. The Quality Control Laboratory was assigned the responsibility for training drivers in all procedures involving the weighing, sampling, and pick-up of milk.

In cooperation with the field service department of the Twin City Milk Producers Association, a comprehensive step by step procedure of pick-up to be followed by all haulers was worked out. A copy of this detailed procedure was given to each hauler on the first day that he began to pick up milk. A representative from the laboratory was assigned to ride with each hauler for three days. During this period the hauler was trained in each step of the pick-up procedure. Particular attention was paid to measuring, agitation, sampling, and the following of a routine procedure from the time he left the cab of his truck at the farm until he returned to the truck to drive to the next stop.

A plan also was set up to enable a laboratory representative to ride with each hauler at least once every two or three months and report on the manner in which the hauler was following instructions.

#### MILK PICK-UP PROCEDURE

The pick-up procedure was mimeographed and given to each hauler on the first day the laboratory representative rode with him; also, included with the procedure sheet was a copy of the question and answer bulletin issued by the Minnesota State Department of Agriculture. The latter was used in preparation of haulers for an examination for a graders and testers license. The first three days were spent with each hauler to familiarize him with procedures and to supervise the carrying out of his duties. The following is a summary of the instruction sheet given to the haulers.

#### INSTRUCTIONS TO BULK TANK TRUCK DRIVERS

1. Before starting in the morning, check to see that sample cases are properly iced.

2. At the first stop tighten all connections. Put hose and electrical connections into the milk house. Take dipper and sample bottle into the milk house.
3. Shut off agitator switch to avoid switching on during
4. Smell milk and measure quantity. If the agitator is measuring,
  - running on entering the milk house, it is necessary to wait until milk stops surging before measurement can be made. Turn on agitator.
5. Convert inches to pounds and record.
6. Connect hose and electrical cord.
7. After three minutes agitation, take sample for fat test (this sample is also used for bacteriological examination as will be discussed later), and sediment test if required. This step may be performed prior to step 4 if the agitator is running when the hauler enters the milk house.
8. Pump milk into the tank house.
9. Rinse tank with cold water, reaching all areas where milk is left on the walls of the tank.
10. Put away hose and samples and proceed to next stop.
11. Deliver milk to designated plant.
12. Agitate complete load for at least five minutes, by circulation, and take a butterfat sample.
13. After last load of the day, proceed to the wash-up center to leave sample and to wash the tank.
14. Follow a regular routine.

#### METHODS OF OBTAINING SAMPLES

The bulk milk hauler must take all samples of individual producers milk. Therefore, procedures for obtaining samples must be carefully worked out and presented to the hauler in a clear and concise manner.

It was decided that a sample should be taken at the time of each pick-up for use in the preparation of a composite butterfat sample, and that a separate sample should be taken for bacterial analysis, using sterile equipment, on those days designated by the laboratory. This procedure produced many problems, as outlined later, so an alternate procedure was adopted. All sample equipment now used each day is sterile; thus a sample can be used for bacteriological analysis at any time, with the balance of the samples being used for butterfat test. The sediment test is made directly from the bulk tank.

In order to ensure that samples would remain in good condition, it was decided to ice all samples every day of the year. To accomplish this an ice cube maker was provided at each wash-up center. This provided an adequate supply of ice for all haulers. The required racks, sample bottles, and storage cabinets also were provided at the wash-up centers. A sample dipper was provided for each truck and was held in a stainless steel tube on the truck compartment door, the tube could be filled with sanitizing solution if desired. In order to avoid freezing during

cold weather it was necessary to add alcohol to the sanitizing solution. The addition of alcohol is costly and causes a white film to form on the dipper. To avoid this a carrying bracket is being added to the dipper tube so that the tube and dipper can be carried into the milk house and carried into the cab of the truck, if necessary, to prevent freezing. The arrangement is presently under test and will be adopted if it proves satisfactory.

#### *Sampling Procedure*

In cooperation with the health departments, a procedure was developed for taking a single sample each day which could be used for butterfat or bacteriological analysis as required.

The hauler is required to take a sample for butterfat each time he picks up milk. The hauler takes his dipper from the tube on the compartment door and a large, sterile, screw cap test tube from the rack. After a minimum of three minutes agitation, a 20-ml. sample is taken and placed in the tube, the tube is shaken and sample discarded, and a second sample then is placed in the tube for use as a test sample. This step is required to avoid the possibility of including water from the dipper or condensate from the tube to the producers sample. When the sample has been taken, the producers number is placed on the bottle and it is returned to the ice chest for transport to the wash-up center. On arrival at the station the samples are warmed, agitated and added to the producers composite bottle. If they are to be used for bacteriological analysis they are transported to the laboratory in ice chests, prior to warming. Bottles are then washed, dried, capped and sterilized for use the next day.

Each hauler was thoroughly instructed in the methods of sampling; an additional day was spent with each hauler for this phase of the operation.

Each hauler is required to obtain a state grader's and tester's license. This also is required of relief drivers. The license now being used is a special license, valid for bulk tank haulers only and must be obtained prior to starting the pick-up of milk.

#### *Sediment testing*

The sediment test is not required for grade A milk in the Twin City market but the test has been used and has been found to be of considerable value to the fieldman. Consequently it was decided to continue using it on bulk milk. The sample is taken by the hauler after agitation of the milk for at least three minutes. A gun type sediment tester is used to force a one pint sample through a standard size sediment

disc. The disc is then removed from the gun and placed in a folder, identified with the producers number and returned to the wash-up center for pick-up and grading by the laboratory. Grading of sediment pads is done according to a set of U.S.D.A. standard photographs and the severity of the grading is in accordance with the wishes of the Quality Control Committee. The grading is somewhat more severe than for a mixed sample of can handled milk. Unsatisfactory sediment pads are returned to the producer for his information, good pads are destroyed after the producer has been notified of the results.

#### POINTS TO BE CONSIDERED IN SETTING UP A TRAINING PROGRAM

In spite of the efforts expended in thoroughly training drivers, problems arise. The following problems concerning the mechanics of setting up a program should be considered:

#### *Initial Contact with the Hauler*

There must be some way that the driver can get in touch with the instructor at any time and arrange a meeting place. He must be able to call at any time and the instructor must be prepared to ride with him at any time of the day. During the transition from hauling milk in cans to that of driving a bulk tank truck, it must be remembered that if a man has been hauling milk in cans he must continue to do so until all his producers receive bulk tanks. Some haulers will have to take care of their can route first, thus it will be necessary to ride with them in the late afternoon. On the other hand, if he gets a replacement for his can route he will be available for his tank truck route in the early morning. The instructor must be prepared to work on Saturday and Sunday if necessary, although, in many cases weekend work may be avoided by proper planning.

#### *Procedure of Training*

Explanations to the hauler do much to get across to him the tasks he has to do, the instruction sheet also helps, but it has been found that the best method of instruction is by demonstration. This is accomplished by having the instructor pick up the first couple of stops and while doing so, explain to the hauler why the various steps are done. The rest of the time can be spent advising the hauler and checking accuracy. With proper instruction the hauler should have a good grasp of his job by the end of three days.

#### *Making Clear the Importance of the Job.*

Some haulers have spent years hauling milk in cans, and they feel that there is nothing further to learn

about milk hauling. It is important to point out to new bulk milk haulers that they are undertaking an entirely new type of job, with increased responsibility and much more rigorous performance requirements. The hauler must now act as a grader, sampler and measurer, in addition to hauling milk. These operations affect the economics of both producer and processor. Therefore, extreme care must be used by every hauler at all times. The hauler must make advance provision for a relief man during vacation and during periods of illness. This advance preparation is necessary, for his relief man must be trained and licensed. He can no longer pick up a local boy the night before and tell him to go and pick up a load of milk and deliver it to the plant, and feel reasonably sure that the job will be done.

#### *Regulatory Aspects of the Job*

The Quality Control Laboratory does all testing of producers milk for St. Paul and Minneapolis Health Departments, and the results are used officially for grading purposes. Since the bulk tank driver takes all samples, he indirectly becomes part of the regulatory mechanism. He, on the other hand, is employed by the producer. He must, therefore, be thoroughly trained and cognizant of his responsibilities.

#### SOME PROBLEMS ENCOUNTERED IN THE PICK-UP OPERATION AND HOW THEY WERE HANDLED

As each new hauler was instructed and as the program got under way, problems began to crop up. It became obvious that certain points required more emphasis than others. The first thing that became obvious was that each point of the procedure had to be demonstrated in the minutest detail and careful attention had to be given to seeing that the prescribed routine was followed. This is necessary, for each man often thinks he has a better way of doing the job. When the program first started, a separate sample was taken for bacteriological analysis, using a single service milk thief. As most haulers had no previous laboratory experience, the reason for each step in taking samples had to be thoroughly explained. It was found necessary to show each man how to handle test bottles and milk thieves; how to remove and replace the screw cap on sample bottles without contaminating the sample; even how to properly ice a sample, record the number and temperature and handle all equipment in an aseptic manner.

The picking up of sterile equipment presented a problem, as most haulers had no other reason to come to the laboratory. This was taken care of by main-

taining a supply of sterile equipment at the wash-up station. A list of dates when samples were to be taken by the haulers was posted and each hauler picked up the required equipment on the indicated day. The supply was replenished by the laboratory representative when he picked up samples. This procedure required cooperation with the haulers so that they did not divulge the date when samples were to be taken. This point presented some problems making it necessary to modify this procedure somewhat. The man responsible for washing the tank trucks was given the list and he notified each hauler the evening prior to his sampling day. This eliminated the need for posting sampling dates in advance. Because of the variety of problems incidental to taking a special sample, the universal sampling procedure previously discussed was worked out and is now used.

As the program started in the fall it soon became necessary to heat the compartments of the truck tank to prevent freezing of hose and samples when temperatures dropped below freezing. This was accomplished by running copper tubing, connected to the truck cooling system, under the floor of the compartments.

Experience has shown that a month should elapse, after conversion to the bulk tank system, before the first samples are taken for bacteriological examination. This allows time for the hauler to become completely familiar with his job and allows time for the producer to develop a routine for cleaning and looking after his tank properly. This procedure tends to avoid accidental high counts and thus encourages confidence in the system.

The following list of some of the specific problems encountered in the past two years and the corrections or alterations that were made might be of interest.

1. Some haulers are resentful at first of having to take bacterial and sediment samples. Constant education eventually convinces them that this is an integral part of their job.
2. There is often a change over of helpers that makes it difficult to keep them trained and checked. This has been overcome by making it the responsibility of the hauler to train his own helper with the understanding that he will be checked at a later date by the laboratory. This system has worked very well.
3. Some haulers are more careless than others in recording weights, in identifying samples and in properly icing samples. They have to be

watched carefully and reprimanded occasionally. It was found desirable to continue icing for 12 months to avoid excuses in the spring and fall if the hauler decided the temperature did not indicate that ice would be necessary. It also was found necessary to stop the practice of recording temperatures on the bottles as there was continual confusion between temperature figures and producer's numbers.

4. Instead of having only a few people picking up samples, as under the can system, a much larger group is involved in picking up samples of bulk milk. Communication, supplies, and the establishment of a uniform procedure became very important.
5. Because of the large number of people involved, it is more difficult to supervise them and see that they wear clean clothes, have clean hands and do a careful job when they are taking samples.
6. When a special sample was used for bacterial analysis, samples were frequently missed. It was difficult to get additional samples, for it was necessary to contact the hauler, find out which day he was picking up the milk of the missed patron and have a man at the plant to receive the sample. This type of procedure is costly, therefore, missed samples must be kept at a minimum. Some difficulty was encountered with producers knowing when samples were to be taken for bacterial analysis. This resulted in a tendency to slack up in wash-up of equipment for a period between sampling dates. It was finally decided to take a single sterile sample each day to overcome the many problems. This enables the laboratory to test on dates unknown to hauler or producer. Also, missed samples can be quickly replaced. This procedure is now working very well.
7. The most difficult problem concerns communication. Haulers come into plants at varied times and, of course, live in all parts of the production area. If it becomes necessary to relay a message or contact the haulers, it can only be done indirectly through the wash-up centers. If sampling is not done each day, posted notices of sample dates and instructions are not always followed unless someone at the wash-up center follows through to make sure that the haulers

observe the notices; also, the operator of the wash-up station must see that each hauler obtains sampling equipment and turns in the sample on the correct day.

8. Constant supervision is necessary to be certain that samples are handled in such a manner that they can be considered representative of the producers milk supply. Proper mixing, numbering, handling of equipment to ensure sterility, icing samples, refrigeration after removal from ice, all are important in obtaining a representative sample.
9. There has been some concern about the measuring of producers milk in the tanks. Pick-up tankers tend to be short of milk when weighed in at the plants. There is a strong indication that the increased reading on the sticks is due to incomplete cleaning, although they are washed with hot water and dried just prior to use. Experience with cleaning the sticks with Bon Ami has shown closer agreement with the weigh scale and is now part of each haulers regular routine. There is also some variation obtained in the scale weights when different people weigh the loads. Extreme care must be exercised in the operation of weight scales, if proper weights are to be obtained.

This is a summary of the many problems encountered and does not mean that all haulers will present all of the problems. The large majority of haulers, if properly trained, will do a good job and seldom give cause for concern.

In conclusion, it should be pointed out that this type of operation, when begun, requires the utmost cooperation of all concerned. The plants, wash-up centers and the haulers must work together. During the past two years an excellent spirit of cooperation has existed in the Twin City area. A transition period which otherwise might have been difficult, has passed with little difficulty, and a new, smooth functioning system of milk pick-up is operating in the Twin City area.

#### REFERENCES

- (1) Lawton, W. C. A Quality Control Committee and a Quality Milk Supply. *American Milk Review*, 19 (12): 28-32. 1957.
- (2) Olson Jr., J. C. Practical Aspects of Uniform Quality Standards For Milk, Milk Products and Milk Supply. Milk Industry Foundation, Milk Supplies Section. *Convention Proceedings*. October, 1950.