Idaho State Department of Agriculture
Bulk Hauler/Sampler training manual.

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Section 1: PURPOSE

The purpose of this manual is to provide the farm bulk milk hauler/sampler with the proper knowledge and procedures for the successful collection, transportation, and delivery of milk from the dairy farm to the milk plant. All the information within this document derives from the Pasteurized Milk Ordinance (PMO) and haulers/samplers are highly encouraged to read the PMO. It will also serve to refresh the experienced bulk milk hauler/sampler with the same techniques and principles which are required by the dairy industry.

Uniform methods are essential in agitating, weighing, sampling, and pick-up of farm bulk milk to assure the milk producer and milk plant are each treated equally and fairly. The way you perform your duties and collect samples directly influences an entire load of milk. By failing even one step within these procedures, milk samples can be altered and cost processors, as well as producers significantly.

Section 2: INTRODUCTION

The quality of milk delivered to the plant depends on how well the bulk milk hauler/sampler identifies and eliminates all unsatisfactory milk before pumping it into the tank truck. The frequency of pick-up should never be longer than seventy-two (72) hours.

The licensed bulk milk hauler/sampler is more than a truck driver. They have the responsibility to evaluate milk quality before it leaves the farm. They determine the amount of milk purchased by the processor and are responsible for the collection of official samples for laboratory examination and payment.

This places a great responsibility on the bulk milk hauler/sampler. They must check the temperature, odor, and appearance of the milk. You must also use accurate and proper procedures in measuring and sampling the milk. Additionally, haulers must ensure that their equipment and the equipment used are properly maintained, cleaned, and sanitized during all parts of the process (milk sampling, transfer, and drop-off).

Sampling and measuring the milk are important duties to ensure a fair and accurate transaction between the milk producer and processor. The milk must always be measured accurately, and a true representative sample is obtained so that both quality and composition tests will accurately represent the contents of the farm bulk milk tank. Dairy processors depend on the bulk milk hauler/sampler knowledge for milk quality. Therefore, it is important to use proper techniques and procedures to prevent contamination of the milk while grading, measuring, sampling, and pumping. If proper procedures are not strictly followed errors in evaluation can occur, which may cause milk to be improperly accepted or rejected. This will cause an economic loss for either the milk producer or the milk plant.

If there is more than one farm bulk milk tank located on a farm, each tank should be separately sampled, measured, and checked for temperature, odor, and appearance. (With the exception of an approved in-line sampling system, which samples all tanks simultaneously). When a farm bulk milk tank is in use, no milk stored in cans may be sampled or picked up for delivery.

Section 3: LICENSING

It is strongly recommended that the prospective bulk milk hauler/sampler not only read this training manual and the PMO but train with a licensed bulk milk hauler/sampler for a minimum of two weeks before taking the test. Observing the legal practices of sampling and weighing milk by a licensed bulk milk hauler/sampler, including the proper procedures of stick reading is paramount in developing proper skills.

The PMO and Idaho Rules state: "*The grading, sampling, measuring, and pumping of milk from a farm bulk milk tank, and the delivery of the milk to a dairy plant, receiving station, or transfer station* ***shall only be done by a licensed bulk milk hauler/sampler****"*. This also includes the relief or part-time bulk milk hauler/sampler.
The valid license shall be kept in the bulk milk hauler/sampler's place of employment or the office where they most frequently deliver milk. This license shall be available for inspection upon the request of an authorized official.

The bulk milk hauler/sampler should also receive a wallet-sized, numbered identification card to certify their right to sample. This card shall be carried with them at all times on the job and given to a regulatory official when asked during an evaluation.

A prospective bulk milk hauler/sampler shall immediately apply for licensing. Upon receipt of the application, the appropriate state regulatory agency will issue the prospective bulk milk hauler/sampler an instruction manual. Upon satisfactory completion of the bulk milk hauler/sampler examination as well as on-farm evaluation, a bulk milk hauler/sampler license/permit, only then will your permit be issued.

The license shall be valid for 3 years and must be renewed by December 31 of the 3rd year. Every licensed bulk milk hauler/sampler is required to attend a licensing session prior to renewing his/her license.

Section 4: APPEARANCE

The bulk milk hauler/sampler is a handler of human food, and his/her appearance and sanitary habits should reflect this role. A clean, neat appearance with good personal habits is a requirement of the PMO. The bulk milk hauler/sampler shall not use tobacco products in the milk house. Tobacco products are considered an impairment to checking the milk supply for off odors. No bulk milk hauler/sampler that has an infected wound, sore, or lesion on his/her hands exposed on a person's arms may measure, sample, or collect milk at a dairy farm.

The clean outward appearance of the bulk milk pickup tanker also establishes confidence in the bulk milk hauler/sampler's ability to handle a food product. The bulk milk pickup tanker must be of sanitary design and construction. The bulk milk pickup tanker must meet the requirements of the 3-A Sanitary Standard for Stainless Steel Automotive Transportation Tanks for Bulk Delivery and Farm Pick-Up Service, Number 05-15. Or approved by the regulatory agency.

Section 5: CHECKLIST PRIOR TO STARTING ON THE ROUTE

The bulk milk hauler/sampler must have certain supplies and equipment to satisfactorily perform the requirements of measuring, sampling, pumping, and transporting the milk. Before starting, check for the following supplies and equipment:

1. All milk tank trucks that transfer Grade "A" milk and milk products, shall be washed, and sanitized at a permitted milk plant, receiving station, transfer station, or milk tank truck cleaning facility. The milk tank truck shall be cleaned and sanitized prior to its first use. When the time elapsed after cleaning and sanitizing, and before its first use, exceeds ninety-six (96) hours the tank must be re-sanitized. It is allowable to pick up multiple loads continuously within a twenty-four (24) hour period, provided the milk tank truck is washed after each day's use.

2. The bulk milk pickup tanker and all its accessories shall be cleaned and sanitized in accordance with applicable requirements. The sample transfer equipment shall be properly washed and sanitized. The responsibility to clean and sanitize the tank and all its accessories of the bulk milk pickup tanker may lie

with a plant employee. However, it is the bulk milk hauler/sampler's responsibility to check the tank and all of its appurtenances to ensure its sanitary condition.

3. The most recent cleaning and sanitizing wash tag must be attached to the **outlet valve** of the bulk milk pickup tanker (or in a location acceptable to the Regulatory Agency) until the milk tank truck is next washed and sanitized. When the bulk milk pickup tanker is washed and sanitized, the previous cleaning and sanitizing tag shall be removed and stored at the location where the bulk milk pickup tanker was washed for a period of not less than fifteen (15) days. The following information shall be recorded on the cleaning and sanitization tag:

   A. Location where the bulk milk pickup tanker was cleaned and sanitized.

   B. Date and Time with AM or PM (or optionally, in military time (24-hour clock) of the day the bulk milk pickup tanker was cleaned and sanitized.

   C. Signature or initials of the person who cleaned and sanitized the bulk milk pickup tanker.

   D. Identification of the bulk milk pickup tanker.

4. The following sampling equipment must be present on the truck:

   A. An adequate supply of single-use sample containers properly stored to preclude contamination.

   B. Sample dipper or other sampling devices of sanitary design and material approved by the Regulatory Agency; clean and in good repair (i.e. free of pits, cracks, and breaks).

   C. Sampling dipper **(Unless the route does not require a dipper)** stored in a properly constructed sampling instrument container, with an approved sanitizing solution of the proper strength of 200 ppm (parts per million) chlorine or 50 ppm (parts per million) iodine and sanitized for at least one (1) minute before use.

      E. Applicable sanitizer test kit. (Test kit must match the sanitizer used) and be within the expiration date marked on the kit.

   E. Insulated sample carrying case (Cooler/Ice box) and sample rack, in good repair.

   F. Adequate ice **and** water or other refrigerant to maintain sample temperature of 32°F - 40°F.

   G. An approved calibrated pocket thermometer (metal stem or digital thermometer) (a range of 25°F - 125 °F is recommended) is available for use by the bulk milk hauler/sampler. The accuracy of the thermometer is checked at least once every six (6) months against a thermometer certified by NIST (National Institute of Standard & Testing) (accuracy must be ± 2°F) thermometer. The date the thermometer was checked and the initials of the individual who checked it must be recorded by one of the following methods:

      - Attached to the thermometer
      - Attached to the thermometer case

H. A waterproof, ineffaceable (Permanent) marker to identify samples.

I. Watch or other timing device for timing milk agitation.

J. Adequate supply of milk weight tickets and a pen or pencil to record the required information.

Section 6: ENTERING THE MILK HOUSE

When entering the Milk house the hauler must be sure to do so in a sanitary manner. Ensure all equipment that is required for that facility is properly carried in and stored. Place the milk transfer hose through the hose port and ensure that the cap is on and secure.

Section 7: ODOR AND APPEARANCE OF MILK

The hauler must examine the milk for odor and appearance and determine that it is acceptable prior to pumping the milk from the silo or tank into the milk tanker.

1. **Odor:**

The most important factor in consumer acceptance of dairy products is flavor. Milk flavor control must begin at the farm.

IT IS IMPORTANT THAT THE BULK MILK HAULER/SAMPLER NOT TASTE THE MILK FOR OFF-FLAVORS BECAUSE OF POTENTIAL HEALTH PROBLEMS CAUSED BY RAW MILK. Nevertheless, the bulk milk hauler/sampler should realize that off-flavors in raw milk invariably show up as off-odors, and if off-odors are found by the hauler/sampler, off-flavors are also present.
Normal milk has virtually no odor. The bulk milk hauler/sampler should have a firm impression as to what constitutes normal milk so that he can judge the milk he collects with confidence.

If the milk has a serious off-odor or appearance (such as those that follow), the bulk milk hauler/sampler should reject it. The plant field staff should be contacted immediately so that the cause can be determined and corrected. In case a bulk milk hauler/sampler is uncertain as to whether a tank should be accepted, contact the plant for guidance, and obtain a sample for the plant on which a final decision may be made.

Any slight change in quality should be immediately brought to the attention of the producer and the milk plant by making an appropriate comment on the producer's milk weight ticket. This warning may often be the earliest indication of the start of trouble. Even if a load of milk is rejected due to odor or appearance, a milk sample must still be taken.

Some of the more common off-odors and their possible causes are:

A. **Feed:** The feed a cow eats may impart certain odors to milk. Some stronger feeds will carry through to the milk more noticeably than others. Odors resembling green grass, silage, turnips, and alfalfa hay are outstanding examples. Feed odor can be minimized or eliminated by taking the cows off offending feeds at least 4 hours before milking. Certain feeds can be detected in milk if fed to the cow even 15 to 30 minutes before milking.

B. **Barny:** This odor is caused by cows breathing foul air due to poor barn sanitation and/or ventilation. Proper ventilation, good sanitation, and proper milking procedures will correct this problem.

C. **Foreign:** Any objectionable odor foreign to milk such as sanitizers, fly spray, paint, oil, kerosene, creosote, or a medicinal substance, will render the milk unacceptable or unfit for use. Such an odor may be caused by direct contamination of the milk or the absorption of airborne contaminants within the vicinity of the area used for milk storage.

NOTE: Sanitizers are included in this category because the residue of sanitizers, such as hypochlorite and iodophor if left on dairy equipment, may be absorbed by milk and impart a foreign odor. Phenolic compounds used in udder ointments may combine with iodophor or hypochlorite sanitizers to form a highly objectionable foreign odor which is detectable in a very low concentration.

D. **Garlic/Onion:** This obnoxious weed flavor, imparted to milk when the cow eats garlic, onions, or leeks, is not classified as one of the usual feed flavors described above. The garlic/onion flavor is recognized by the distinctive odor suggestive of its name. It may be so objectionable as to render the milk undesirable for use.

E. **Musty:** This odor is suggestive of musty or moldy hay. It may be absorbed directly by the milk, but is more likely to come from feed or stagnant water consumed by the cow.

F. **Rancid:**

1. **Oxidative Rancidity:** Oxidized milk gives off-odors usually described as cardboardy, metallic, or tallowy. It is usually more noticeable during the winter months when the cows are on dry feed. The most frequent cause of oxidative rancidity is by the contamination of milk with small amounts of copper or iron from milk contact surfaces.
2. **Hydrolytic Rancidity:** Hydrolytic rancidity found in milk will give off an odor resembling spoiled nut meats. It is more noticeable during winter when cows are on dry feed, or during late lactation. Agitation of warm raw milk in the presence of air, causing foaming, will result in a rancid type odor within a few hours.

G. **Sour:** Sour milk will have a malty odor and will be found when poorly cooled milk results in excessive bacterial growth. It also may result from bacterial growth due to insanitary milking practices and/or insanitary equipment. Good sound sanitary practices and prompt cooling in the farm bulk milk tank will prevent this problem.

H. **Weedy:** The weedy odor is not included among the usual feed odors. It may include obnoxious odors resembling such plants as ragweed, bitterweed, or peppergrass, and may become a very troublesome flavor defect. It can be eliminated or minimized by keeping cows away from weed-infested pastures or by not offering feeds containing such weeds until after the cow is milked.

2. **Checking for Odors:**

The odors gather just below the cover of the farm bulk milk tank. To properly check for off-odor, remove a small port opening, put your nose down to the opening and smell the milk. Never open the entire lid; this will let the odors escape into the air. The detection of off-odors can be affected by several external factors. The bulk milk

hauler/sampler should strive to eliminate these factors:

A. Milk house odors.
B. Gasoline fumes adhering to clothing.
C. Smoking immediately prior to checking for odors or smoking in the milk house.
D. Eating or chewing aromatic candy, tobacco, medicine, beverages, foods, etc.
E. Use of strongly scented shaving lotion, soap, and other toiletries on the bulk milk hauler/sampler.

3. **Appearance:**

Following are some milk quality problems that may become evident while checking for appearance. Any of these defects should be sufficient reason to reject the tank of milk.

A. **Bloody milk:** The milk from mastitis cows may contain blood. A small amount of bloody milk can give a large quantity of normal milk a reddish tinge.

B. **Flaky milk:** Milk from cows having mastitis may show light flakiness or pronounced stringy curd particles.

C. **Extraneous matter:** Floating extraneous matter includes such things as insects, hair, chaff, and straw. The presence of extraneous matter may result from careless handling of milk, open doors, torn screens, dusty feeding conditions, and improper cleaning of the udder before milking.

Other problems which may become evident while checking for an appearance include frozen and partially churned milkfat. These problems, depending on their severity, may or may not be reasons for rejecting the milk.

4. **Checking for Appearance:**

Normal milk color ranges from bluish white to golden yellow and is free from all foreign or clotted matter. When you are checking the appearance of a farm bulk milk tank of milk, make sure that the tank light is on and/or the area is well lighted. Lift the lid and observe the complete, undisturbed milk surface. Any evidence of partially churned butterfat, frozen milk, or other conditions which may alter the reliability of your sample, should be indicated on the sample container to inform the lab. Bring this to the attention of the producer and notify the field staff to have this problem corrected.

Section 8: MEASURING THE MILK

The milk shall be completely **motionless** (quiescent) when measurements are made. If the agitator is running when you arrive, it may be easier for you to sample before shutting off the agitator.

Turn the agitator switch off, to make sure that the agitator does not start while you are measuring. Wait at least 5 minutes for the milk to become completely motionless. (quiescent)

Preparation of the Measuring Stick:

The essential steps to assure accurate measurement of the milk volume are:

A. **Internal Measuring Stick:**

1. Wash and dry hands with single service hand towels at the hand wash sink.

2. The measuring stick must be clean, dry, and free of fat. It also must be warmed to room temperature before the milk is measured. The measuring stick should be stored in the farm bulk milk tank in its proper position between readings. To prepare the stick, take a single service paper towel and dry the measuring stick in the range where the milk line falls. Rub the measuring stick with a towel several times until the stick is slightly warm. A measuring stick prepared in this manner will give you an accurate reading.

3. Now the stick is ready to be positioned into the milk. If there is any foam, gently move the foam away from the measurement area with the end of the measuring stick. Then lower it slowly into the milk until it reaches a point approximately ½ inch from its proper position. Wait a few seconds, and then gently lower the stick till it seats itself naturally.

4. Remove the stick and read at once. The marking should be read at eye level and in a well-lit area. **Repeat this procedure until two (2) identical measurements are taken**. The measuring stick is graduated into 1/32 or 1/10 of an inch. Each graduation is equivalent to a determined number of pounds of milk posted on a conversion chart specifically calibrated for each tank. The serial number of the farm bulk milk tank, measuring stick, and conversion chart must be the same.

When the milk line is close to but not exactly on a specific mark, it is read as if it were exactly on that mark. When the milk line falls exactly between two marks, always read to the nearest even mark. It is important to always read the stick in this manner to avoid inaccurate results. Immediately record the reading on the weight ticket.

If the measuring stick for the farm bulk milk tank is stored outside the milk tank, it must be cleaned and sanitized, and completely dry prior to measuring the milk.

B. **External direct reading gauge of the sight glass or plastic tube type:**

1. Connect the external reading gauge sight glass or plastic tube to the farm bulk milk tank outlet valve. Care must be given not to contaminate the farm bulk milk tank outlet area.

2. Slightly open the farm bulk milk tank outlet valve so that the milk slowly enters the external reading gauge sight glass or plastic tube.

3. Adjust the external reading gauge marking device to identify the bottom of the milk meniscus in the sight glass or plastic tube. Adjustments should be made at eye level and in a well-lighted area.

4. Read the external reading gauge in the same manner that an internal measuring stick is read.

The farm bulk milk tank and its calibration are the responsibility of the producer under the supervision of the plant and state regulatory agency. However, there are conditions that the bulk milk hauler/sampler should be aware of that could contribute to inaccurate weight problems.

a. The tank is incorrectly calibrated.
b. Errors in the weight conversion chart (or an unreadable chart).

c. Farm bulk milk tank is out of level.
d. Heaving, cracking or settling of milk house floor causing the farm bulk milk tank to shift.
e. Improper footings under the tank legs.
f. A wearing or distortions of the measuring stick bracket or seat.
g. The warping of the farm bulk milk tank interior.

If you notice any discrepancies, you should contact the plant or plant field staff and have them investigate the problem.

Section 9: CORRECT AGITATION TIME

In order to obtain a sample that is truly representative of the milk in the tank, proper agitation must be accomplished. This is necessary for three reasons; first, since the lighter milk fat rises to the top, it must be uniformly mixed in the body of the milk. This procedure reduces erratic milk fat tests. Second, since bacteria rise with the lighter fat, excessive bacteria and somatic cell counts will result from improperly mixed milk. Studies have shown that comparing bacterial counts taken from the same tank of milk will result in substantially higher counts when the milk is unagitated than from a sample taken after five (5) minutes of agitation. Third, if the milk is contaminated with an animal drug residue, the sample will have an erroneous level of residue if the milk is not properly agitated before sampling.

A general rule is five (5) minutes of constant agitation (or more if determined by testing) for a 1,000-gallon tank or less (8600 lbs.); and for a tank of more than 1,000 gallons (8600 lbs.), constant agitation for at least 10 minutes (or more if determined by testing) will be necessary.

The proper agitation time should be determined by the field staff. He should have taken sufficient samples to ensure that the milk in all areas of the tank is completely mixed during the specified time.

Check your watch or timing device when you turn on the agitator. If the agitator is running when you arrive, start the proper agitation timing when all the milk has been pumped into the tank or silo, and the milk line or hose has been disconnected from the silo or tank. **Agitation time cannot be started while the tank is being milked into and the milk line or hose is connected to the tank or silo.**

Section 10: TEMPERATURE

The bulk milk hauler/sampler should take and record the temperature of milk at each pick-up. Temperature determinations provide much useful quality control information for both the producer and the milk plant.

1. The bulk milk hauler/sampler shall record the temperature of the milk at each pickup. Milk shall be cooled to 45°F (7°C) or less within four (4) hours after starting the milking operation. The milk shall then be cooled within two (2) more hours to 40°F (4.4°C) or less. Provided, that the blend temperature after the first milking and the subsequent milkings does not exceed 45°F (7°C). **Milk that is above 45°F (7°C) cannot be picked up unless permission is received from the fieldman for the dairy in which the milk is being evaluated on a one-time basis.**

2. The reading and recording of the temperature will provide a history of the farm bulk milk tank efficiency. If the temperature readings of milk in the tank gradually increase, it will show the bulk milk hauler/sampler that the tank is not cooling properly. Contact the producer and the plant field staff to resolve the problem.

3. A high milk temperature can be a warning that the milk may have an off-flavor or be high in bacteria.

4. Check the thermometer on the farm bulk milk tank and inform the producer if the thermometer is incorrect. When using the **farm's bulk milk tank thermometer to record the milk temperature it must be checked at least once a month** with the bulk milk hauler/sampler's thermometer**. A record of this must be kept in the milk house.** It is recommended the bulk milk hauler/sampler uses a metal stem dial or a digital thermometer with an external adjustment for calibration. The accuracy of this thermometer must be checked initially and every six (6) months thereafter. The date the thermometer was checked and the initials of the individual who checked it must be recorded by one of the following methods:

- Attached to the thermometer
- Attached to the thermometer case

Be sure to sanitize the thermometer stem in 200 ppm (parts per million) chlorine 50 ppm (parts per million) iodine and sanitized for at least one (1) minute before use each time before checking the temperature of the milk.

All farm bulk milk tanks manufactured after January 1, 2000, shall be equipped with an approved temperature-recording device.

a. The temperature-recording device shall be operated continuously and be maintained in a properly functioning manner. Circular charts shall not overlap. Electronic records that comply with the applicable provisions of Appendix H., IV, and V, with or without a hard copy, may be used in place of temperature-recording records.

b. The temperature-recording device shall be verified every six (6) months and documented in a manner acceptable to the Regulatory Agency using an accurate (+/- 1◦C (2◦F)) thermometer that has been calibrated by a traceable standard thermometer, within the past six (6) months, with the results and date recorded and the thermometer being properly identified, or by using a traceable standard thermometer that has been calibrated within the last year.

c. Temperature-recording records shall be maintained on the premises for a period of a minimum of six (6) months and are available for review by the Regulatory Agency. Except that, the electronic storage of required temperature records, with or without a hard copy, shall be acceptable, provided the computer- and computer-generated temperature records are readily available for review by the Regulatory Agency.

d. The temperature-recording device should be installed in an area convenient to the milk storage tank and acceptable to the Regulatory Agency.

e. The temperature-recording device sensor shall be located to permit the registering of the temperature of the contents when the tank contains no more than twenty percent (20%) of its calibrated capacity.

f. The temperature-recording device shall comply with the current technical specifications for tank recording thermometers.

g. A temperature-recording device and/or any other device that meets the intent of these ADMINISTRATIVE PROCEDURES and technical specifications and is acceptable to the Regulatory Agency can be used to monitor/record the farm bulk milk tank temperature.

h. The temperature-recording records shall properly identify the producer, date installed, tank or silo identification, if more than one (1), and signature or initials of the person installing the record.

Section 11: SAMPLING PLANS

The sampling of milk from a farm bulk milk tank is an important part of the bulk milk hauler/sampler's responsibilities. Regardless of the sampling plan used, extreme care should be taken to obtain a representative sample.

1. **Universal Sampling Plan:** A sampling plan that has become very popular is the Universal Sampling Plan. The true Universal Sampling Plan provides one sample that can be used for all laboratory analyses, but not all analyses need necessarily be done on the same sample. This plan eliminates the need for the hauler/sampler to collect several types of samples and simplifies the sampling equipment necessary. It also enables the laboratory to monitor the producer's quality without requesting special samples from the bulk milk hauler/sampler.

The producer is unable to anticipate when bacteria or sediment tests are to be run because the same size sample is removed from his tank at every pick-up. The universal sample of 1, 2, or 4 oz. also requires less milk, so, consequently, less milk is wasted.

2. **Sampling for a Specific Test:** An alternate type of sampling plan requires that only a fat sample be taken daily. This sample, when returned to the plant, can be either tested daily as a fresh fat sample, or a portion of the sample can be placed in a bottle to be composited with samples taken on other days. The composite sample will be tested for fat at a later date. The composite bottle must not leave the plant.

The laboratory will periodically request additional samples for bacteria, sediment, antibiotics, or other desired tests. The laboratory will inform the bulk milk hauler/sampler and the bulk milk hauler/sampler is then required to sample for the tests requested.

This method requires that a bulk milk hauler/sampler differ their sampling technique to suit the test required. For example, when sampling for fat, a sterile sample container is not needed; however, when sampling for bacteria count, a sterile container is required. When sampling for sediment, a 16 oz. (pint) sample may be needed instead of a smaller sample.

Section 12: SAMPLING THE MILK

The proper analysis of a sample is dependent upon the reliability of the sampling procedure. To be satisfactory, the sample must be representative, and the sampling procedure must be done in a manner to prevent contamination of the sample. Always take a second sample of milk at the first stop of each load as a control. This sample must be marked with the collection time (AM or PM) or (optionally, in military time (24-hour clock)), date, temperature, producer and hauler/sampler identification, and the words "Temperature Control" or "T.C." or Temp. The "Temperature Control" is collected at the first stop to ensure the temperature of the Refrigerated Sample case has

been maintained during the duration of the route. When the collected samples are submitted to the lab or collection location the "T.C." is also submitted and a new "T.C." is required at the first of the next set of samples collected.

These sampling procedures should be strictly followed:

A. **Manual Sampling Device**

1. Wash and dry your hands **directly** before collecting the sample.

2. Identify each sample container with the producer number, the date of pick-up, and the route number.

3. Make sure the tank is properly agitated. (See Section 9:)

4. If a dipper is used, make sure it is clean and has been properly sanitized in a sanitizing solution of 200 ppm (parts per million) chlorine or 50 ppm (parts per million) iodine and sanitized for at least one (1) minute before use. The sampling device should remain in the solution until it is removed to sample the milk. Do not remove the sampling device prior to entering the milk house. If dipper is stored and maintained at the farm, make sure it is clean and properly sanitized before sampling the milk.
5. Open the sample container, being careful not to contaminate the interior of the container and/or its cap. Contamination of the sample container will alter the laboratory results and possibly reduce the producer's payment. Do not dip the sample container in the milk.

6. Rinse the sampling device twice in the milk before taking the sample, being careful not to put your hands in the milk. The dipper should be extended **6-8 inches** into the milk. The proper way to rinse off the sanitizing solution is to fill the dipper **twice** with milk and dump it back out.

7. Sample the milk in the tank making sure the sample container is not held over the milk supply while pouring the sample. The sample container should not be filled more than ¾ full. This will enable the laboratory to properly mix the sample before testing.

8. Properly close the sample container, making sure it is sealed correctly so that it does not leak or puncture the sample container. When using a whirl-pak bag, be careful that the sharp corners are folded in such a way that they do not puncture the bag and make sure enough air is trapped inside the bag to properly agitate the sample.

9. Close the lid of the farm bulk milk tank.

10. **Immediately** place the sample in the refrigerated sample case and keep it at 32-40°F until delivery. Do not transport samples in pockets or any other manner en route to the refrigerated sample case. Provide a method, such as the use of racks or drainage holes in the sample case, to keep the sample free from contamination due to melting ice. The top of the sample must be kept above (Not submerged) the refrigerant (ice and water).

11. After you have sampled the milk, rinse the sample dipper with tap water and return it to the sanitizing solution.

B. **Sampling Cocks**

1. Wash and dry your hands **directly** before collecting the samples.

2. Identify each sample container with the producer number, the date of pick-up, and the route number.

3. Make sure the tank is properly agitated. (See Section 9.)

4. Prepare a sanitizing solution containing 200 ppm (parts per million) chlorine or 50 ppm (parts per million) iodine. Submerge the sampling cock by fitting a bag of the chlorine solution over and around it, or completely saturate the interior of the sampling cock with sanitizer from a spray bottle. While holding the top of the bag of sanitizing solution tightly around the body of the sampling valve, flush the sanitizer in and out of the sampling cock, or saturate the interior of the sampling cock with sanitizer from a spray bottle for at least 1 minute.

5. Purge the sampling cock valve with at least 2 liters (½ gallon) of milk.

6. Open the sample container, being careful not to contaminate the interior of the container and/or its cap.

7. Place the sample container under the sample cock and collect the sample, being careful not to contaminate the sample. The sample container should not be filled more than 3/4 full.

8. Properly close the sample container, making sure it is sealed correctly.

9. **Immediately** place the sample in the refrigerated sample case and keep it at 32°F to 40°F until delivery. Provide a method, such as the use of racks in the sample case to keep the sample free from contamination.

C. Requirements for using an approved in-line sampler

A protocol specific to each milk producer who directs loads milk tank trucks (through by-passing the use of farm bulk milk tanks or silos) while utilizing an approved in-line sampler shall be developed by the Regulatory Agency in cooperation with the sampling equipment manufacturer, the milk buyer, the milk producer, and FDA. As a minimum, the protocol should include the following:

1. A description of how the milk sample is to be collected, identified, handled, and stored.

2. A description of the means used to refrigerate the sample collection device and milk sample collection container throughout the milk sample collection period.

3. A means to monitor the sampler device temperature and milk sample temperature, and milk temperature.

4. A description of how and when the sampler is to be cleaned and sanitized, if not of a single-use design.

5. A listing of the licensed bulk milk hauler/samplers that have been trained to maintain, operate and sanitize the sample collection device as well as to collect, identify, handle and store the milk sample.

6. A description of the method and means that will be used to determine the weight of the milk on the bulk milk pickup tanker.

D. Septum on the Silo/Bulk tanks exterior.

1. Wash and dry your hands **directly** before collecting the sample.

2. Identify each sample container with the producer number, the date of pick-up, and the route number.

3. Make sure the tank is properly agitated. (See Section 9.)

4. Remove the protective cover, (if provided with the septum) from the sampling septum and using an alcohol swab or an approved sanitizer, properly sanitize the septum surface. (If sanitizing the septum surface with 200 ppm (parts per million) chlorine or 50 ppm (parts per million) iodine, you must wait 1 minute prior to inserting the needle.

5. To begin the sampling of a farm vertical or horizontal tank; aseptically remove the new, sterile, sealed needle by breaking the seal on the needle case and pulling the needle out using an **alcohol swab.**

6. Insert the needle through one (1) of the unused sampling guide ports. To correctly insert the needle, slant the needle slightly toward the center of the sample septum.

7. Fill the sample container (i.e. vial) to the identified line, if present, or ¾ full with milk (without touching the container to the needle)

.

8. Properly close the sample container, making sure it is sealed correctly. Remove the needle from the sampling septum and dispose of all single-use items in the "Sharps" container, or an appropriate container provided by the producer.

9. **Immediately** place the sample in the refrigerated sample case and keep it at 32°F to 40°F until delivery. Provide a method, such as the use of racks in the sample case to keep the sample free from contamination.

Section 13: SANI-GUIDE DISCS

The use of sani-guide discs will emphasize the importance of clean milk. The disc will show coarse sediment (flies,

hair, straw, etc.) in a farm bulk milk tank of milk.

A new sani-guide disc is placed between the farm bulk milk tank valve and the transfer hose at each pick-up. When you finish pumping the milk, examine the disc and notify the producer and the field staff if excessive visible contamination is evident on the disc.

The sani-guide disc should be shown to the producer and sent to the field department if contamination/or sediment.

Section 14: CONNECTION OF HOSE

The transfer hose should be brought into the milk house through the hose port while still **capped**. Remove the cap from the farm bulk milk tank outlet valve being sure to store the outlet valve cap in a sanitary manner. Sanitize the tank outlet valve being sure to saturate with sanitizer the entire surface of the valve. Then remove the cap from the transfer hose, properly stored in a sanitary manner, and connect it to the farm bulk milk tank valve outlet. The **only time the transfer hose is not capped is during loading and cleaning**. If there is any evidence of the farm bulk milk tank valve leaking, properly rinse with water and sanitize the valve, then notify the producer and the field staff to correct this**. It is unnecessary to wait 1 minute after applying sanitizer before connecting the transfer hose. The minute time frame for sanitizing the outlet valve is the period from when sanitizer has been applied to the valve to when milk contacts the sanitized area.**

If a portable transfer pump (which is maintained at the farm) is utilized, the bulk milk hauler/sampler is responsible to make sure that the pump has been properly cleaned and sanitized prior to use.

Section 15: PUMPING THE MILK

The outlet valve of the tank or silo is not to be opened until the milk has been sampled and measured.

To aid in the removal of butterfat that may have clung to the side of the tank and to help protect the plant against a fat loss due to this factor, it is a good practice to leave the agitator running until the tank is at least half empty. Make sure the agitator is shut off before foaming or splashing begins to prevent product loss due to foam.

It is also important to shut off the pump as soon as possible after the tank is empty to avoid sucking air and milk house odors into the truck tank. When the tank is empty, shut off the refrigeration compressor on a direct expansion tank or the water circulation pump on an ice bank tank.

If the tank has not completely emptied when your truck tank is full, return to the farm and empty the tank before the producer adds any additional milk. If not emptied, the farm bulk milk tank cannot be washed and sanitized before the next milking.

1. Partial removal of milk from the farm bulk milk tank

a. There shall be no partial removal of milk from milk storage/holding tanks by the bulk milk hauler/sampler, except partial pickups may be permitted when the milk storage/holding tank is equipped with a seven (7) day recording device complying with the specifications of Appendix H. or other recording devices acceptable to the Regulatory Agency, provided the milk storage/holding tank shall be cleaned and sanitized when **empty** and shall be emptied at least every **seventy-two (72) hours**. In the absence of a temperature-recording device, partial pickups may be permitted as long as the milk storage/holding tank is completely emptied, cleaned, and sanitized prior to the next milking.

Do not start rinsing the tank while the hose is still attached.

Section16: DISCONNECT THE HOSE AND RINSE THE FARM BULK MILK TANK

After the milk is pumped from the tank, and the pump is shut off, remove the hose and cap **immediately**. The hose may be drained and rinsed prior to being capped. Visually check the bottom of the farm bulk milk tank for sediment. If it is excessive, make note of it and notify the producer and the plant field staff.

Rinse the interior of the farm bulk milk tank with warm water. This will make it easier for the producer to clean up. Close the tank covers after rinsing to prevent the tank from drying out and keep out any foreign material.

Rinse the floor down to keep it clean and free of milk. Any milk remaining on the floor will sour and develop acid which will eventually erode the flooring.

Section 17: RECORDING RESULTS

To avoid error, promptly record all results. Each of the following results should be included on your bulk milk receipt:

1. Date of collection.
2. Time of pick-up.
3. Producer name.
4. Plant number.
5. Milk quality - odor and appearance.
6. Milk temperature.
7. Measuring stick reading.
8. Converted weight (milk weight).
9. Name of the buyer.
10. Hauler/sampler's signature and permit number.
11. BTU identification (for Grade A producers)

Section 18: FINAL FARM CHECK

Before you leave the milk house, make note of any abnormalities to report to the producer and/or plant field staff. Note the general condition of the milk house, its construction, and any situations which may cause contamination of product or incorrect results in performing your job.

Samples shall be taken of all milk; even if it is rejected or frozen. Any off-condition milk should be noted for the laboratory.

Before you leave, make sure the milk house is in better shape than when you arrived. Rinse the floor, hang up the hose, and turn the lights out.

Section 19: RECAP OF PROPER PROCEDURES

As you do your job, mentally use one of the following charts. If the agitator is running as you enter the milk room, follow Chart A. If it is not, use Chart B.

Chart A (Agitator Running)

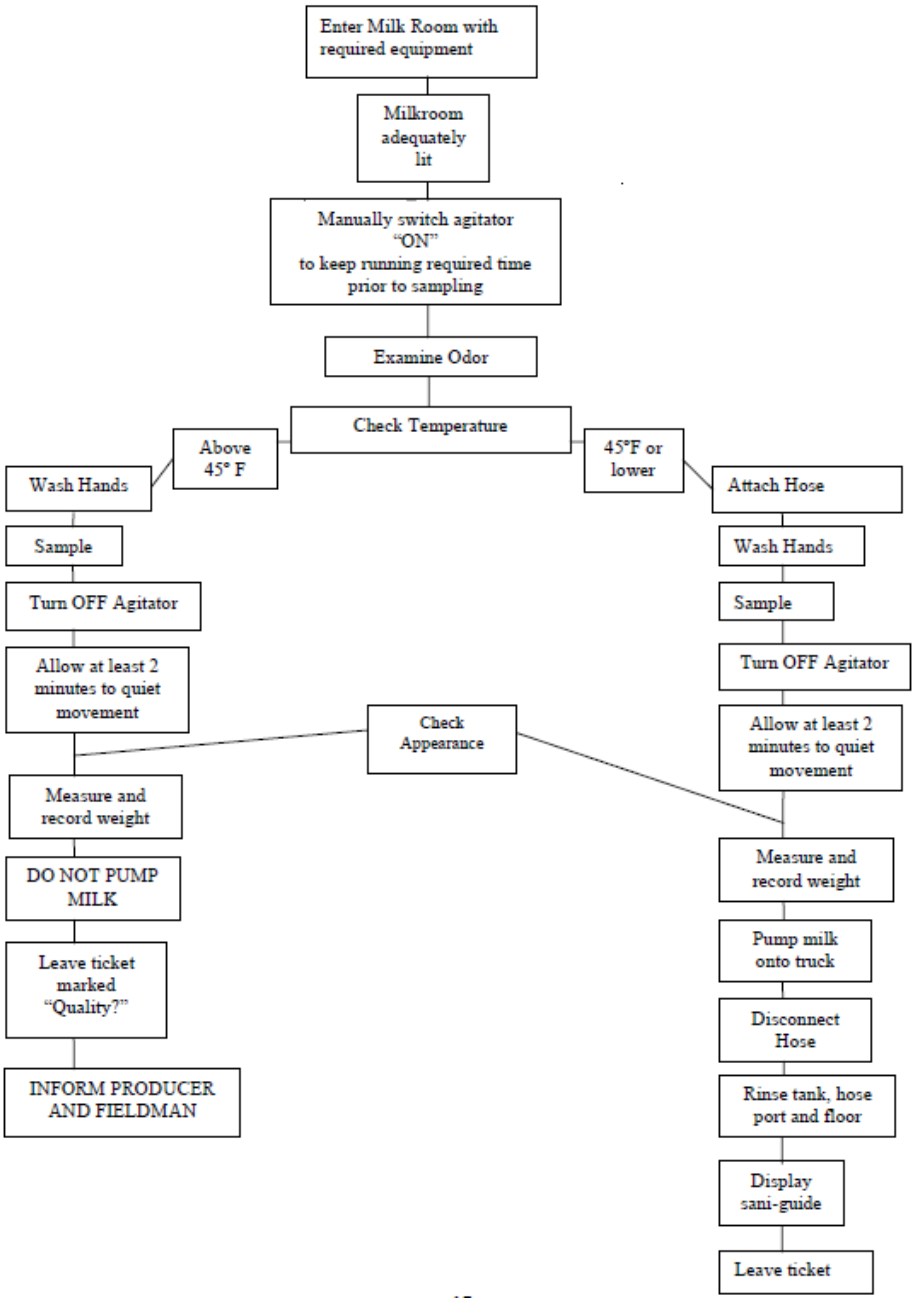
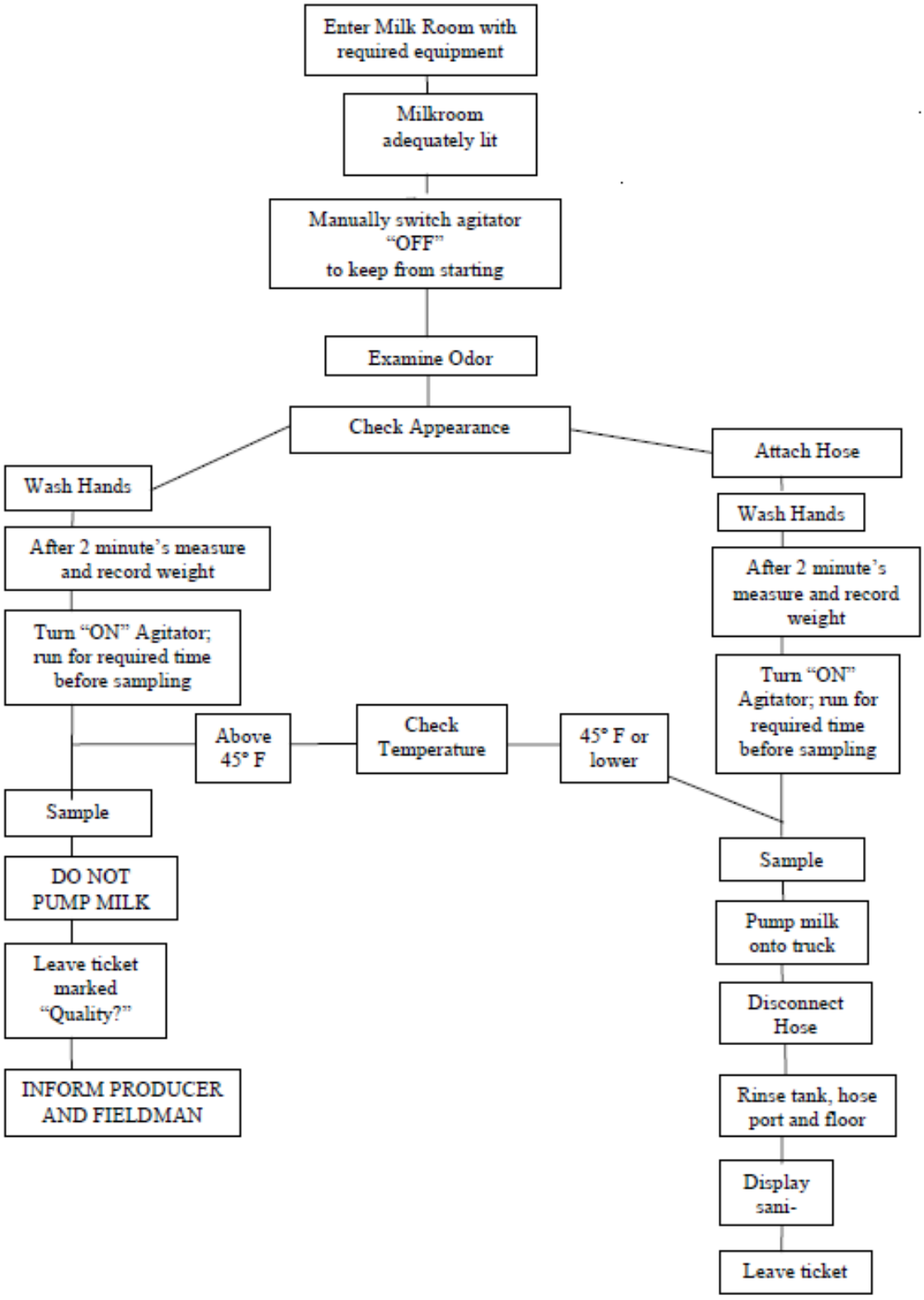


Chart B (Agitator not Running)



Section 20: COMPOSITION OF MILK

General knowledge of the composition of milk will prove useful in the bulk milk hauler/sampler's contact with producers. The main constituents of milk are water, milkfat, protein, lactose (milk sugar), and ash.

The average composition of milk is:

Water	87.0%
Milkfat	4.0%
Lactose	5.0%
Protein	3.3%
Ash	0.7%

Causes of milkfat variations

The variation in the percent of milkfat has the greatest effect on the producer's returns. The bulk milk hauler/sampler must provide an adequately mixed, reliable sample for milkfat analysis. This is done by following the proper sampling procedure outlined in this manual. There are, however, some reasons for milkfat variations which the hauler/sampler cannot control. These variations are commonly due to:

1. Breed of the cow.
2. Age of cow.
3. Genetic potential of individual cows.
4. Stage of lactation.
5. Seasonal changes.
6. Udder infection.
7. Type and quality of feed.
8. Milking procedures.
9. Health of cow.
10. Heat periods.
11. Excitement.

Section 21: MILK QUALITY

Oftentimes the bulk milk hauler/sampler will be asked by farmers about the quality tests performed by the laboratory. The following summary will help explain the reasons for the tests and his responsibilities as the official sampler.

1. Milkfat

The results obtained from the fat tests are the basis for payment to the producer for his milk. The bulk milk hauler/sampler must have knowledge of the proper procedure to ensure that this test is accurate and representative of all milk in the farm bulk milk tank.

The Babcock, Gerber, Milk-O-Tester, etc. are the common tests used for determining milkfat.

2. Bacteria Count

Bacteria are microscopic one-celled organisms that are found on and in all living animals, in the soil, water, ponds, and even wells. Manure, flies, insects, rodents, utensils, and equipment are sources of many types of harmful bacteria. Because of the widespread presence of bacteria, contamination of equipment that comes in contact with milk must be avoided.

The amount and kind of bacteria found in a sample of milk is an indication of the sanitary conditions and practices occurring on the farm and the extent of milk cooling. Contamination can occur when measuring, sampling, and transferring milk. Therefore, extreme care must be taken to prevent further contamination due to the bulk milk hauler/sampler.

3. Inhibitor Test

The presence of antibiotic residues can cause violent allergic reactions in some individuals. These residues are of medicine and drugs used to treat the milking animals for udder or other infections. Therefore, tests are run on every bulk milk pickup tanker load prior to unloading at the plant.

Excessive residues or sanitizers used on milk handling equipment will also show up on these tests.

4. Sediment Tests

This is a rapid method to determine whether the milk is being properly protected from contamination due to dust, and/or improperly cleaned udders. The presence of sediment indicates insanitary methods of milking and milk handling practices. A clean sediment disc pad, however, does not prove that sanitary practices exist.

The test consists of filtering a sample of milk through a white cotton disc and checking the amount and kind of residue left.

5. Added Water

The temperature at which milk will freeze is a constant factor and can easily be determined by laboratory tests. If water is added either deliberately or by accident, the freezing point will become closer to that of pure water. Adding water to milk is illegal. This test is called a Cryoscope Test.

The bulk milk hauler/sampler must exercise care and make sure the transfer hose is disconnected before the farm bulk milk tank is rinsed in order to prevent adulteration with water.

6. Somatic Cell Count

Somatic cells are primarily white blood cells. Many factors influence the number of somatic cells in milk. The cow's age, production capacity, and stage of lactation influence the normal level of somatic cells in the milk. Irritation and infection of a cow's udder caused by poor milking practices, improper cattle housing, improperly operating milking machines, or poor pasture conditions will show up as increased somatic cell counts. High somatic cell counts signify that some cows in the herd are experiencing illness or injury.

The test measures the level of white blood cells in the milk. A level of 500,000 per ml or less indicates normal milk and a mastitis condition would not be expected.

Section 22: DIRECT LOADING of MILK TANKERS (21 CFR, 2011 PMO)

Provided, based on Regulatory Agency acceptance, the direct loading of milk from the milk house to the milk tank truck may be conducted through a properly designed hose port that adequately protects the milk house opening or by stubbing the milk transfer and associated CIP cleaned lines outside the milk house wall in accordance with Item 5r, **ADMINISTRATIVE PROCEDURES** #15 as stated below.

1. The transfer of milk from a farm bulk milk tank to a bulk milk pickup tanker is through a hose port located in the milk house wall. The hose port shall be fitted with a tight door, which shall be in good repair. It shall be kept closed except when the hose port is in use. An easily cleanable surface shall be constructed under the hose port, adjacent to the outside wall, and sufficiently large to protect the milk hose from contamination. Provided, milk can be transferred from a farm bulk milk tank to a bulk milk pickup tanker by stubbing the milk transfer and associated CIP cleaned lines outside the milkhouse wall, provided:
    A. A concrete slab of adequate size, to protect the transfer hose, shall be provided under the stubbed sanitary milk and CIP cleaned lines.
    B. The outside wall of the milk house, where the sanitary piping and concrete slab are located shall be properly maintained and kept in good repair.
    C. The sanitary piping, stubbed outside the milk house, shall be properly sloped to assure complete drainage and the ends of the piping, which are located outside, shall be capped when the transfer hose is disconnected.
    D. After the completion of milk transfer, the milk lines, and transfer hose shall be properly CIP cleaned.
    E. After the CIP cleaning process has been completed; the transfer hose shall be disconnected, drained, and stored in the milk house. Proper storage of the transfer hose includes capping the ends and storing the entire hose up off the floor. The sanitary piping outside the milk house shall be capped at all times, except when transferring milk or being CIP cleaned. When the caps are not being used, they shall be properly cleaned and sanitized after each use and stored in the milk house to protect them from contamination. A transfer hose manufactured with permanent hose end fittings, attached in such a manner that will assure a crevice-free joint between the hose and the fitting, may be stored outside of the milk house, provided it is CIP cleaned; the stubbed piping and hose length is of sufficient design to allow complete drainage after cleaning and sanitizing, and the hose remains connected to the stubbed piping when not in use.
    F. Means shall be provided to sanitize the milk-contact surfaces of the transfer hose and bulk milk pickup tanker fittings prior to the connection of the transfer hose to the bulk milk pickup tanker.
    G. At all times, the bulk milk pickup tanker manhole openings(s) shall remain closed, except for brief periods for sampling and examination when environmental conditions permit.

2. A transportation tank, with or without overhead protection, may be used for cooling and/or storing milk on a dairy farm. If a suitable shelter is provided for a transportation truck, used for cooling and/or storing milk, such shelter shall be adjacent to, but not a part of, the milkhouse and shall comply with the prerequisites of the milkhouse with respect to construction items; lighting; drainage; insect and rodent

control; and general maintenance. (Refer to Appendix C. for suggested plans and information on the size, construction, operation, and maintenance of milk houses.)

In addition, the following minimum criteria shall be met:

A. An accurate, accessible temperature-recording device shall be installed in the milk line downstream from an effective cooling device, which cools the milk to 7°C (45°F) or less. Electronic records that comply with the applicable provisions of Appendix H., IV and V, with or without hard copy, may be used in place of temperature-recording records. An indicating thermometer shall be installed as close as possible to the recording device for verification of recording temperatures. This indicating thermometer shall comply with all applicable requirements in Appendix H. This thermometer shall be used to check the temperature recording device during the regulatory inspection and the results recorded on the recording records or into the electronic data collection, storage and reporting system.

B. Temperature-recording records shall be maintained on the premises for a period of a minimum of six (6) months and are available for review by the Regulatory Agency. Except that, the electronic storage of required temperature records, with or without hard copy, shall be acceptable, provided the computer- and computer-generated temperature records are readily available for review by the Regulatory Agency.

C. The milk shall be sampled at the direction of the Regulatory Agency in a manner so as to preclude contaminating the milk tank truck or sample, by an acceptable milk sample collector.

D. The milk tank truck shall be effectively agitated in order to collect a representative sample.

When the Regulatory Agency determines conditions exist whereby the direct loading of a milk tank truck (through by-passing the use of a farm bulk milk tank(s) and/or silo(s)) can be adequately protected and sampled without contamination, a shelter need not be provided if the following minimum criteria are met:

A. The milk hose connection is accessible to, and made from within, the milkhouse. The milk hose connection to the milk tank truck is completely protected from the outside environment at all times. Provided, based on Regulatory Agency acceptance, the direct loading of milk from the milkhouse to the milk tank truck may be conducted through a properly designed hose port that adequately protects the milkhouse opening or by stubbing the milk transfer and associated CIP cleaned lines outside the milkhouse wall in accordance with Item 5r, **ADMINISTRATIVE PROCEDURES** #15.

B. To assure continued protection of the milk, the milk tank truck manhole must be sealed after the truck has been cleaned and sanitized.

C. The milk tank truck shall be washed and sanitized at the permitted milk plant, receiving station or transfer station receiving the milk or at a permitted milk tank truck cleaning facility.

D. An accurate, accessible temperature-recording device shall be installed in the milk line downstream from an effective cooling device, which cools the milk to 7°C (45°F) or less. Electronic records that comply with the applicable provisions of Appendix H., IV and V, with or without hard copy, may be used in place of temperature-recording records. An indicating thermometer shall be installed as close as possible to the recording device for verification of recording temperatures. This indicating thermometer shall comply with all applicable requirements in Appendix H. This thermometer shall be used to check

the temperature recording device during the regulatory inspection and the results recorded on the recording records or into the electronic data collection, storage and reporting system.
E. Temperature-recording records shall be maintained on the premises for a period of a minimum of six (6) months and are available for review by the Regulatory Agency. Except that, the electronic storage of required temperature records, with or without hard copy, shall be acceptable, provided the computer- and computer-generated temperature records are readily available for review by the Regulatory Agency.

F. The milk shall be sampled at the direction of the Regulatory Agency, in a manner so as to preclude contaminating the milk tank truck or sample, by a permitted milk sample collector. The milk in the milk tank truck shall be effectively agitated in order to collect a representative sample.

G. The milk tank truck shall be parked on a self-draining concrete or equally impervious surface during filling and storage.

H. When direct loading of a milk tank truck using either a hose port, as addressed above, or stubbing the milk transfer and associated CIP cleaned lines outside the milkhouse wall in accordance with Item 5r, **ADMINISTRATIVE PROCEDURES** #15, overhead protection of the milk hose connection to the milk tank truck shall be provided.

Section 23: STANDARDS FOR BULK MILK HAULER/SAMPLER (Title 37 Section 412)

The following standards are hereby adopted relating to milk hauler/sampler and to the operation of transportation tanks:

1. All bulk milk hauler/samplers must possess a permit issued by the Department of Agriculture. All bulk milk hauler/samplers shall be subject to such examination and abilities as the Department of Agriculture may prescribe by regulation in order to receive and retain such permit. The fee for the permit shall be twenty-five dollars ($25.00). The permit shall be valid for three (3) years and must be renewed by December 31 of the third year.

2. The milk line shall be passed through a special port opening through the milk house wall with care to prevent contact with the ground or floor of the milk house. The port opening shall be closed when not in use.

3. It shall be the responsibility of the bulk milk hauler/sampler to assure that, in the event the processor washes and sanitizes the truck, the operation has been adequately performed, and that prior to use the bulk milk pickup tanker has been properly sanitized. In the event it is the bulk milk hauler/sampler's responsibility to sanitize the bulk milk pickup tanker it shall be done with a chlorine solution of the proper strength.

4. The bulk milk hauler/sampler's hands shall be washed immediately before gauging the milk.

5. The milk shall be observed and checked for abnormalities or adulteration, and all abnormal or adulterated milk shall be rejected.

6. The milk volume in the farm tank shall be determined in a sanitary manner.

7. The milk in the farm bulk milk tank shall be thoroughly agitated. Milk samples for analysis shall be taken in a sanitary manner into properly identified sterile containers. All sampling shall follow standard methods.

8. After the milk is pumped to the bulk milk pickup tanker, the milk conductor tubing shall be capped and returned to the vehicle storage cabinet. Care shall be taken to prevent soiling of the milk line by contact with the milk house floor, operator's hands, or the ground.

9. The bulk milk hauler/sampler shall rinse the farm bulk milk tank and accessories free of milk with clean water immediately after emptying.

10. The bulk milk hauler/sampler shall be responsible for the proper use of the transportation tank and accessories.

Section 24: STANDARDS FOR BULK MILK HAULER/SAMPLER (REGULATIONS)

A. Any individual who samples, collects, weighs, or transports producer milk and/or milk samples that are used in an official capacity for either producer payment or quality analysis **shall possess a permit issued by the Department of Agriculture**. The permit shall be valid for three years and must be renewed by December 31 of the third year. The permit will be issued to the application after attending a training session on proper procedures and passing an examination administered by the Department of Agriculture as well as an on-farm evaluation.

1. No permit will be issued unless a score of 70% or better is made on the examination and the applicant has been evaluated by an ISDA employee and demonstrated proper sampling and hauling procedures.

2. A training and refresher course conducted by the Idaho Department of Agriculture will be given in each area once each year. Holders of permits must attend the course during the year they received such permits.

3. Every holder of a permit must attend a training and refresher course and pass an examination administered by the Department of Agriculture prior to renewing the permit.

4. Any bulk milk hauler/sampler that is found to violate Idaho Department of Agriculture rules and regulations will be required to attend a training and refresher course during the year the violation(s) occurred and be reevaluated within 21 days of the date of the warning letter. Violations will be determined by bulk milk hauler/sampler evaluations conducted by designated employees or agent(s) of the Idaho Department of Agriculture.

5. Each new prospective bulk milk hauler/sampler must immediately apply to the Idaho Department of Agriculture for a permit. A date will be set for special training, licensing session, and evaluation, and upon satisfactory completion, a bulk milk hauler/samplers permit will be issued.

6. A substitute bulk milk hauler/sampler, in case of emergency, can haul milk for **3 days** without a permit providing the state regulatory official has been notified and the substitute bulk milk hauler/sampler is given instructions on the proper sampling, grading, and weighing of milk.

7. If the truck is left unattended, the bulk milk hauler/sampler shall affix a seal or lock on all tanker

ports, covers, and doors to protect the milk from possible adulteration.

8. No bulk milk hauler/sampler shall grade, measure, or sample their own milk without written authorization from the processor receiving the milk and ISDA.

9. **The permit may be revoked if:**

A. The bulk milk hauler/sampler **fails** to grade milk in a farm bulk milk tank to its odor and appearance and fails to **reject** all milk that is abnormal in odor or flavor or that contains visible garget or other extraneous matter.

B. The bulk milk hauler/sampler **does not accurately take and record the temperature** of the milk or if he fails to reject the milk in excess of 45°F.

C. The bulk milk hauler/sampler **fails to wash his hands** before he proceeds to measure or sample the milk.

D. The bulk milk hauler/sampler **fails to follow acceptable procedures in measuring** the amount of milk in the farm bulk milk tank or if he does not, immediately after taking the reading, convert the reading to pounds or gallons using the chart of the tank manufacturer and record it on duplicate forms, with one copy to be posted in the milk house and one transmitted to the dairy plant.

E. The bulk milk hauler/sampler **fails to agitate** the milk for at least five minutes in farm bulk milk tanks less than 1,000 gallons (8600 lbs.) and ten minutes in farm bulk milk tanks over 1,000 gallons before taking a sample or if he **withdraws any part of the milk from the farm bulk milk tank before the sample is taken.**

F. The bulk milk hauler/sampler **does not take a sample** for butterfat testing and/or bacterial analysis in an approved manner, or sufficient size, in an approved container properly labeled, and cool and maintain the sample between 32°F - 40°F.

G. The bulk milk hauler/sampler **rinses the farm bulk milk tank before disconnecting and capping the hose.**

H. The bulk milk hauler/sampler **siphons milk from milk cans, water troughs or other containers** other than the farm bulk milk tank. Milk poured into the farm bulk milk tank from other than regular milking machine pails will not be allowed.

Section 25: REQUIREMENTS FOR USING AN APPROVED ASEPTIC SAMPLER

General Requirements:

The application to install an acceptable QMI aseptic sampling septum system utilizing a sample septum, a sterile needle, a sterile single-service use sample collection bag with sanitary tubing, a septum sampling device attached to the outlet valve of the farm bulk milk tank or silo, and a peristaltic pump to dispense the milk into the sterile single service use sample collection bag for the “Universal” farm bulk milk tank and/or silo samples shall be filed with the operation installing the QMI aseptic sampling septum system, the Regulatory Agency, the

person responsible for the operation's regulatory oversight and the QMI aseptic sample septum system installer. (Refer to the Application Form on page 9.)

Farm Bulk Milk Tank and/or Silo Requirements:
The farm bulk milk tank(s) and/or silo(s) shall have a properly working agitator equipped with a timer. This timer shall allow for the farm bulk milk tank and/or silo agitator to run the minimum amount of time as the farm bulk milk tank or silo manufacturer specifies.

Device Requirements:
1. The acceptable QMI supplied septum sampling device shall be attached to the outlet valve of the farm bulk milk tank or silo, as long as it does not create a dead end, so that it can be cleaned-in-place (CIP) when the farm bulk milk tank or silo is washed and sanitized, or alternatively, the QMI septum sampling device may be removed after each use and immediately hand cleaned and sanitized in the two (2) compartment wash and rinse vat, located in the milkhouse, and also prior to its next usage by the bulk milk hauler/sampler. (**NOTE:** The installation shall be approved by the Regulatory Agency in conjunction with the sampling equipment manufacturer.)

2. The person(s) performing the following Steps shall wash his/her hands before carrying out any of the Steps that follow and whenever they become contaminated during the cleaning, sanitizing, handling and sampling procedure.

3. After the completion of the farm bulk milk tank or silo CIP wash and sanitizing cycle, remove the QMI septum sampling device from the farm bulk milk tank or silo outlet valve and place a cap or protective cover over each fitting end of the QMI septum sampling device. The QMI septum sampling device shall be stored in an appropriate manner to protect it from contamination (closed, clean single-service use plastic bag or multi-use plastic container) in a clean location in the milkhouse until its next usage. If the QMI septum sampling device is traveling with the bulk milk pickup tanker, the QMI septum sampling device shall be removed from the farm bulk milk tank or silo outlet valve and immediately hand cleaned and sanitized in the two (2) compartment wash and rinse vat, located in the milkhouse, by the bulk milk hauler/sampler. Protective caps or a cover shall be placed over each fitting end of the QMI septum sampling device and the QMI septum sampling device shall be stored in an appropriate manner to protect it from contamination (closed, clean single-service use plastic bag or multi-use plastic container) in a clean compartment of the bulk milk pickup tanker or in the truck cab until its next usage. (**NOTE:** The cleaning, sanitizing and storage of the QMI septum sampling device shall be approved by the Regulatory Agency.)

4. The protective caps or cover over each fitting end of the QMI septum sampling device shall be in place at all times when the septum sampling device is not being used.

5. Use only acceptable QMI sterile septum inserts.

Septum Use and Replacement Procedure:

A. There are seven (7) septum insert sampling ports on each QMI septum. Use a new septum insert sampling port each time a farm bulk milk tank or silo is pumped out and the required "Universal" sample is collected. Replace the QMI septum when all seven (7) septum insert sampling ports have been used.

B. Use each QMI septum insert sampling port **ONLY ONCE**. Pierced septum insert sampling ports can be readily seen. Once pierced, a septum insert sampling port cannot be used again.

C. When all seven (7) QMI septum insert sampling ports have been used, the person replacing the septum shall properly wash their hands before removing the nut that holds the QMI septum in place and remove the used QMI septum insert and discard.

D. **CLEAN** and **SANITIZE** the QMI septum insert holder area and install a new QMI septum insert, replace the nut, hand tighten the nut and then use a wrench to give it an additional 1/8th turn, but do not over-tighten. The protective cover shall be kept over the QMI septum insert at all times when not being used. (**NOTE:** If a positive antibiotic result is obtained from the producer's milk supply, manually clean and sanitize the septum insert holder and replace the QMI septum insert before the next milking.)

6. The protective cover for the QMI septum insert shall be in place at all times when the septum is not being used.

7. New, sterile, sealed needles shall be used for each sample collection.

8. Use only acceptable QMI supplied sterile single-service use sample collection bags that are designed specifically for this QMI aseptic sampling septum system. These QMI sterile single-service use sample collection bags shall only be used for collecting a sample from one (1) farm bulk milk tank or silo.

9. Use only the peristaltic pump recommended by QMI.

10. The volume of the milk sample collected cannot be more than three quarters (¾) of the volume of the QMI sterile single-service use sample collection bag that is being used. The speed (RPM) of the specific type of peristaltic pump and the size of the QMI sterile single-service use sample collection bag being used shall be determined and recorded on the Application Form and on each farm weigh ticket.

11. The QMI sterile single-service use sample collection bag shall be placed in a properly designed portable hand carry type cooler, utilizing a water/ice mixture, to maintain the sample at 0ºC – 4.4ºC (32ºF - 40ºF) during the time when milk is being pumped out of the farm bulk milk tank or silo to maintain the temperature of the sample in accordance with the temperature requirements of the PMO.

12. No matter where supplies (septum inserts, sterile needles, sterile single-service sample collection bags, etc.) are stored, either in the milkhouse, or in a clean compartment of the bulk milk pickup tanker, or in the truck cab, they shall be stored in an appropriate manner to protect them from contamination (closed clean single service use plastic bag or multi-use plastic container).

Sampling Procedures, Taking a Representative Sample, and Sample Handling Steps:

1. The person(s) performing the following Steps shall either be the milk producer who transports milk only from his/her own dairy farm or possess a valid bulk milk hauler/sampler's license/permit issued by the Regulatory Agency. Their sampling and sub-sampling techniques shall be evaluated at least once every twenty-four (24) months by the Regulatory Agency.

2. Because of the design and the data obtained from the study there is not a need to run the bulk milk tank or silo agitator immediately prior to pumping the milk from the bulk milk tank or silo onto the bulk milk pickup tanker using this QMI aseptic sampling septum system. (**NOTE:** If the milk in the farm bulk milk tank or silo

will only be a partial pick-up, which shall be conducted in accordance with Item 10r-Utensils and Equipment - Cleaning of the PMO, the milk shall be adequately agitated for the required time, a minimum of five (5) minutes or as required by the farm bulk milk tank or silo manufacturer, before the pumping of the milk and the collection of the sample may begin. Following adequate agitation, perform the QMI aseptic sampling septum system procedures as cited below.)

3. The person(s) performing the following Steps shall wash their hands before carrying out any of the Steps and whenever they become contaminated during the sampling procedure.

4. If the QMI sampling septum device is stored either in the milkhouse, or in a clean compartment of the bulk milk pickup tanker, or in the truck cab, remove the protective caps or cover from each fitting end of the QMI septum sampling device and properly hand **WASH** and **SANITIZE** the QMI sampling septum device in the two (2) compartment wash and rinse vat, located in the milkhouse. (Refer to Items 1 and 3, **Device Requirements**.)

a. Use a spray bottle or other acceptable means with an approved sanitizer at the appropriate concentration to adequately sanitize the outlet valve of the farm bulk milk tank or silo. (**NOTE:** Sanitize the farm bulk milk tank or silo outlet valve with 200 ppm available chlorine solution, or equivalent, and expose the area for a minimum of one (1) minute contact time.)

b. Attach the QMI sampling septum device to the farm bulk milk tank or silo outlet valve.

c. Perform the following Steps as cited below.

5. Remove the protective cover from the QMI sampling septum.

6. Adequately sanitize, using an approved sanitizer at the appropriate concentration, the white covering area over the QMI sampling septum. (**NOTE:** Sanitize the sampling septum surface with 200 ppm available chlorine solution, or equivalent, and expose the area for a minimum of one (1) minute contact time.)

7. Position the QMI peristaltic pump close enough to the farm bulk milk tank or silo outlet valve so that the QMI single-service use sample collection bag can be connected to the needle that will be inserted into an unused septum insert sampling port on the QMI sampling septum. (**NOTE:** The acceptable QMI single-service use sample collection bag shall be placed in a portable hand carry type cooler, containing a water/ice mixture, during sample collection.) (Refer to Item 11, **Device Requirements**.)

8. On the QMI peristaltic pump open the sampling head by lifting up on the lip on the upper part of the peristaltic pump head. (**NOTE:** The Operator's Manual has pictures addressing this Step.)

9. Take out a QMI single-service use sample collection bag and locate the fatter section of the tubing. Place this fatter tubing section in the space created after opening the peristaltic pump head lid and close the peristaltic pump head lid when the tubing is positioned straight over the rollers in the peristaltic pump head.

10. Take the cover off the sterile needle attached to one (1) end of the QMI single service use sample collection bag tubing and locating an unused QMI septum insert sampling port, insert and push the needle completely into the septum. For the perimeter needle channels, slant the needle toward the center of the channel following the angle of the channel. (**NOTE:** Be careful not to bend the lumen tip of the needle.)

11. Use each QMI septum insert sampling port **ONLY ONCE**! Pierced QMI septum insert sampling ports can be readily seen. Once pierced, a QMI septum insert sampling port **CANNOT** be used again.

12. Smell the milk; observe the milk in a quiescent state; properly obtain the temperature of the milk; and properly measure the milk stored in the farm bulk milk tank or silo. Record the temperature and weight of the milk on the farm weigh ticket.

13. Open the farm bulk milk tank or silo outlet valve, lift the cover over the peristaltic pump just enough to press the start button on the control pad of the peristaltic pump, which turns on the peristaltic pump, and then lower the cover.

14. Make sure the RPMs of the peristaltic pump display match what has been determined to meet the requirements cited in Item 10, **Device Requirements**. Record the RPM reading on the farm weigh ticket. (**NOTE:** One (1) RPM equals approximately one (1) ml per minute.)

15. If milk is not flowing toward the peristaltic pump and the QMI single-service use sample collection bag, press the clockwise-counterclockwise arrows on the peristaltic pump display until the milk starts flowing toward the QMI single-service use sample collection bag.

16. Place and maintain the QMI single-service use sample collection bag in a portable hand carry type cooler, containing a water/ice mixture, during sample collection to maintain the temperature of the sample in accordance with the temperature requirements of the PMO. (Refer to Item 11, **Device Requirements**.)

17. When the farm bulk milk tank or silo has been emptied or the completion of the collection of a partial pickup, which shall be conducted in accordance with Item 10r-Utensils and Equipment - Cleaning of the PMO, turn off the peristaltic pump, remove the needle from the QMI septum insert sampling port, and replace the cover on the needle.

18. Replace the cover on the QMI septum insert.

19. Lift the peristaltic pump head lid to open it to allow the removal of the single-service use sample collection bag sample tubing. The reverse process as was used in Step 9 shall be used**.** Tie a knot in the QMI single-service use sample collection bag tubing close to where the tubing is attached to the QMI single-service use sample collection bag.

20. Take the QMI single-service use sample collection bag and invert rapidly twenty-five (25) times. This agitates the QMI single-service use sample collection bag so a representative sample can then be taken from the milk collected in the QMI single service use sample collection bag**.**

21. Adequately sanitize a cutting device with an approved sanitizer at the appropriate concentration and cut the tubing from the QMI single-service use sample collection bag just above where the tubing attaches to the QMI single-service use sample collection bag. (**NOTE:** Sanitize the cutting device with 200 ppm available chlorine solution, or equivalent, and expose the area for a minimum of one (1) minute contact time.) Tip the QMI single-service use sample collection bag and allow some milk to flow before positioning a properly identified sample vial into the milk stream and fill the sample vial not more than ¾ full. (**NOTE**: This sample vial shall comply with the same labeling identification requirements as would be required for a “universal” sample collected using a conventional sample dipper. When this sample collection is conducted at the first stop per load of milk, a temperature control (TC) sample shall also be collected and properly labeling in accordance with the PMO.)

22. Immediately transfer the sample vial(s), to a properly constructed sample storage case, designed to maintain the milk sample(s) at the required milk temperature (0ºC- 4.4ºC (32ºF-40ºF)), using a water/ice mixture, and which protects the sample containers from contamination.

23. Handle the sample(s) from this point on in the same manner as a "universal" sample collected by the conventional sample dipper procedure.

24. All needles and QMI single-service use sample collection bags shall be properly disposed of in Sharps containers, or an appropriate container provided by the manufacturer.

Section 26: DEFINITION OF TERMS

1. **Bulk Milk Hauler/Sampler:** A bulk milk hauler/sampler is any person who collects official samples and may transport raw milk from a farm and/or raw milk products to or from a milk plant, receiving station or transfer station and has in his/her possession a license/permit to sample such products. Any transportation of a direct farm pickup requires the milk tank truck driver to have responsibility for accompanying official samples.

2. **Milk:** The normal lacteal secretion, practically free from colostrum, obtained by the complete milking of one or more healthy lactating animals (example: cows, goats or sheep)

3. **Milk Producer:** A milk producer is any person who operates a dairy farm and provides, sells or offers milk for sale to a milk plant, receiving station, or transfer station.

4. **Dairy Farm:** A dairy farm is any place or premises where one (1) or more lactating animals (cows, goats, sheep, water buffalo, or other hooved mammal) are kept for milking purposes, and from which a part or all of the milk or milk product(s) is provided, sold or offered for sale to a milk plant, receiving station or transfer station.

5. **Farm Bulk Milk Tank:** The tank located on a dairy farm in which properly cooled raw milk is stored prior to collection by a bulk milk hauler/sampler.

6. **Bulk Milk Pickup Tanker:** A bulk milk pickup tanker is a vehicle, including the truck, tank and those appurtenances necessary for its use, used by a bulk milk hauler/sampler to transport bulk raw milk for pasteurization from a dairy farm to a milk plant, receiving station or transfer station.

7. **Milk Plant:** A milk plant is any place, premises; or establishment where milk or milk products are collected, handled, processed, stored, pasteurized, ultra-pasteurized, aseptically processed, condensed, dried, packaged, or prepared for distribution.

8. **Officially Designated Laboratory:** An officially designated laboratory is a commercial laboratory authorized to do official work by the Regulatory Agency, or a milk industry laboratory officially designated by the Regulatory Agency for the examination of producer samples of grade "A" raw milk for pasteurization and commingled milk tank truck samples of raw milk for drug residues and bacterial limits.

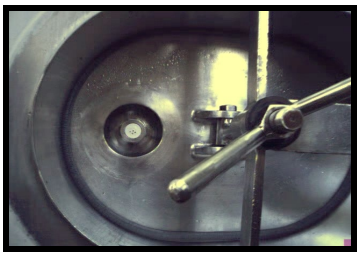
9. **Milk Tank Truck Cleaning Facility**: Any place, premises, or establishment, separate from a milk plant, receiving station or transfer station, where a milk tank truck is cleaned and sanitized.

FORM A
Application to Install an Acceptable QMI Aseptic Sampling Device for the Collection of "Universal" Samples from Farm Bulk Milk Tanks and/or Silos

General Requirements:
Producer Name: _____ Date: _____
Producer Address: _____ State: ____ and Zip: _____
Producer Phone/Fax/E-mail: _____
Producer's Regulatory License or Permit Number: _____
Purchaser of Milk: _____
Producer's Regulatory Inspector: _____
Pounds of Milk/Day Shipped: _____
Model of Peristaltic Pump: _____
The speed (RPM) of Peristaltic Pump: _____
Sample Collection Bags of Approved Material: Yes _____ No _____
Sample Collection Bags of Approved Design: Yes _____ No _____
Material Type: _____
Sample Collection Bags Size: _____ (mls or ozs.)
Sample Container of Approved Material: Yes _____ No _____
Sample Container of Approved Design: Yes _____ No _____
Material Type: _____
Sample Container Size: _____ (mls or ozs.)
Sample Septum SOP for the Sampler on File: Yes _____ No _____
Appropriate Sample Septum SOP Being Followed: Yes _____ No _____
Number of Milking's to Fill the Bulk Milk Pickup Tanker_____
Sample Septum System Design: (Meets Regulatory Agency and PMO Requirements.)
Sample Septum Location: _____
QMI Aseptic Sampling Septum System Operation:
Person(s) Operating the System Trained: Yes _____ No _____
Person(s) Operating the System Training Dates on File: Yes ____ No ____
Person(s) Operating the System Certification #'s on File: Yes ____ No ____
Person(s) who Performed the Training: _____
SOP for the Sample Septum Being Used on File and Being Followed: Yes ___ No ____
Cleaning/Sanitizing Sample Septum Approved by Regulatory Agency: Yes___ No_____
Cleaning/Sanitizing Protocol Posted and Followed: Yes ____ No ____
All materials, approval for the installation plans, approval of the installation and all other relevant areas relating to the equipment construction of the sample septum and its usage shall meet the requirements of Item 9r-Utensils and Equipment Construction of **the most recent edition of the PMO.**

EASY TO USE SAMPLING PROCEDURES

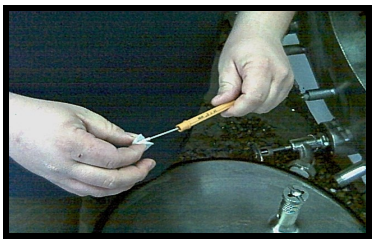
FOR SEPTUM SAMPLING



The milk in the farm vertical or horizontal tank must be adequately agitated for the required time （A general rule is five (5) minutes of constant agitation (or more if determined by testing) for a 1,000 gallon (8600 lbs.) tank or less; and for a tank of more than 1,000 gallons, constant agitation for at least 10 minutes (or more if determined by testing) will be necessary.

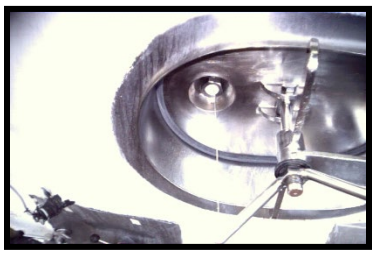
New, sterile, sealed needles must be used for each sample collection.

At the desired sampling time, the person performing the following steps shall wash their hands before handing the equipment used to collect the milk sample. Remove the protective cover, (if provided with the septum) from the sampling septum and using alcohol swab or an approved sanitizer, properly sanitize the septum surface. (If sanitizing the septum surface with 200 ppm (parts per million) chlorine or 50 ppm (parts per million) iodine, must wait 1 minute prior to inserting the needle.



To begin the sampling of a farm vertical or horizontal tank; aseptically remove the new, sterile, sealed needle by breaking the seal on the needle case and pulling the needle out using an **alcohol swab**.

Insert the needle through one (1) of the unused sampling guide ports.



To correctly insert the needle, slant the needle slightly toward the center of the sample septum.

Fill the sample container (i.e. vial) to the identified line, if present, or ¾ full with milk (without touching the container to the needle)
Immediately place the sample container (i.e. vial) into a properly constructed sample storage case, designed to maintain the sample at 32°F - 40 °F and which protects the sample container from contamination.

Remove the needle from the sampling septum and dispose of all single-use items in the Sharps container or an appropriate container provided by the producer.