



FARM

BULK

MILK

HAULER'S

MANUAL

**FOR USE IN THE IOWA MILK
GRADER/HAULER PROGRAM**

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FARM BULK MILK HAULERS MANUAL

FOR USE IN THE IOWA MILK GRADER/HAULER PROGRAM

1. Purpose: The purpose of this manual is to provide a basic overview of the proper techniques of sampling and picking up milk from farm bulk milk tanks. It is very important that you review the four supplements to this manual.

2. Universal Sampling System: When bulk milk haulers collect raw milk samples, the “universal sampling system” shall be used, whereby samples are collected every time milk is picked up at the farm. This system permits the Regulatory Agency, at its discretion, at any given time and without notification to the industry, to analyze samples collected by the bulk milk hauler. The use of the “universal sample” puts more validity and faith in samples collected by industry personnel.

3. More than truck drivers: Farm bulk milk haulers are more than truck drivers, they judge the acceptable milk quality before it leaves the farm. They determine the amount of milk purchased and are the official sample collectors for lab analysis for payment of the milk to producers. The quality of milk delivered to the plant depends on how well the milk hauler identifies and rejects unsatisfactory milk before pumping it into the tank truck. This places a great responsibility on farm bulk milk haulers. They need to check the odor and appearance of the milk. They must also use accurate and proper procedures in measuring and sampling the milk.

4. Samples shall be taken: Samples shall be taken of all bulk tank milk even if it is rejected or frozen. Any off-condition needs to be noted for the lab. The milk hauler is the first in the “Chain of Custody” and is responsible for the milk samples until they are delivered to the delivery point.



5. Important duties: Sampling and measuring the milk to insure a fair and accurate transaction between the producer and the milk purchaser is important. The milk must be measured accurately and a true sample collected so that quality and composition test will accurately represent the contents of the farm bulk tank. If proper procedures are not followed and an error in evaluation occurs, the milk may have been improperly accepted or rejected. This will cause an economic loss for the producer or the milk purchaser and could even cause a public health incident.

1. Milk truck approaches: If the milk truck approach to a dairy facility is contaminated with manure, it is illegal for the milk truck to drive through the manure to pick up the milk. This is for bio-security reasons. The milk truck approach shall be graded and graveled or paved.

2. Frequency of pick-up: Milk shall not be over three days old when picked up at a farm and delivered to a plant.

3. No low volume pickup: Milk shall not be picked up from a farm bulk tank when the milk volume in the tank is insufficient to completely submerge the bulk milk agitator paddle. If a bulk tank has more than one set of paddles, the lower set of agitator paddles must be submerged into the milk. No device, other than the bulk milk tank agitator, shall be used to agitate the milk in a farm bulk milk tank.

4. More than one sample needed: If there are two tanks or more on a farm, each are separately sampled, measured and checked for odor and appearance.

5. The "TC" sample: A temperature control sample is an extra sample taken at the first stop and is required in every sample rack when the samples are delivered to the lab. This sample must be labeled with "TC", the temperature, time, date, and the producer and the milk hauler identification. If milk is picked up again the same day, a new TC sample will need to be taken again at the first stop.



6. Pick up milk only from the farm bulk tank: If a producer has filled containers with milk other than the bulk tank, do not grade, sample or pick up the milk in the other containers. Only the milk from the bulk tank can be picked up. The milk in the other containers cannot be dumped back into the bulk tank to be sampled and graded. If a bulk milk hauler should pick up milk in other containers, the milk haulers permit will be suspended.

7. The producer is not through milking: When arriving to the farm and the producer is not through milking, and/or the swingline is still connected to the bulk tank, do not sample or measure the milk. Wait until the producer turns off the pump and removes the swingline.

8. Training and permitting: Grading, sampling, measuring, transporting samples and pumping milk from a farm bulk milk tank and delivery of the milk to a dairy plant, receiving or transfer station shall only be done by a trained and permitted bulk milk grader/hauler. This also includes relief and part time bulk milk haulers. The “Chain of Custody” of the milk sample is one reason why training and permitting is necessary.

1. The permit: The wallet sized, bulk milk grader permit shall be kept in the possession of the person whose name is on the permit when on the job and shall be available upon inspection or upon request of a state inspector. To start the procedure to obtain a grader/hauler permit call the Department Dairy Products Control Bureau 515/281-3545.

2. Permit renewal: The Iowa milk grader permit is renewable every two-years. A procedure evaluation every 24 months is required and a milk grader school is required every three years before permit renewal.



3. Appearance: Bulk milk haulers handle human food. A clean, neat appearance and good personal habits create an image vital to the dairy industry and establishes confidence in the hauler's ability to do the job.

4. At the farm: Walking around the barn lot and other farm areas other than the milk room should be avoided due to bio-security issues.

5. Bulk milk in truck temperature: The temperature of the milk in a bulk milk truck shall be maintained at 45F or less.

6. Equipment needed: The milk hauler needs to have the following supplies and equipment in order to satisfactorily perform the requirements of measuring, sampling, pumping and transporting the milk:

1. Sample cooler, rack (or floater) and refrigerant.
2. Adequate supply of sample containers stored in a sanitary manner.
3. Sample dipper and holder with proper sanitizing solution.
4. Approved, calibrated (every six months) thermometer.
5. Watch.
6. Applicable sanitizer test kits.
7. Flashlight.
8. Waterproof marker.
9. Adequate supply of single service towels.
10. Adequate supply of weight tickets.

7. Tank and pump washed and sanitized: The truck tank, pump and transfer hose need to have been properly washed and sanitized at a facility permitted by the Iowa Department of Agriculture. It is also the milk hauler's responsibility to make sure that the tank and pump are thoroughly washed and sanitized and the pump is broken down to clean it thoroughly.



1. Wash tag: The most recent wash tag attached with the following information:

1. Identification of the milk tank truck.
2. Date and time including AM or PM the truck tank was cleaned and sanitized.
3. Location where the milk tank truck was cleaned and sanitized.
4. Signature or initials of the person that cleaned and sanitized the tank.

2. Do not taste the milk: It is important that the hauler not taste the milk for off-flavors because of the health problems caused by raw milk. If off-odors are found by the hauler, you can almost be sure that off-flavors are also present.

3. Normal Milk Odor: Normal milk has virtually no odor. Milk haulers should have a firm impression as to what constitutes normal milk so that they can judge all milk that is collected with confidence.

4. Serious off-odor or appearance: If the milk has a questionable off-odor or appearance, the milk hauler shall reject the milk. The hauler then needs to notify the purchaser immediately so that the cause can be determined and corrected. The purchaser also needs to be notified for guidance if the hauler is uncertain whether the milk should be accepted or not. In every case, a sample needs to be obtained and taken to the plant. The sample will be analyzed to make the final decision.

5. Slight change in quality: Any slight change in quality needs to be brought to the attention of the producer and the purchaser by making an appropriate comment on the producer's milk weight ticket. This warning is often the earliest indication of the start of milk quality problems.

6. Sour milk odors: Sour milk will have a malty odor and will be found when poorly cooled milk results in excessive bacterial growth. Sour milk must be rejected.



7. Checking milk for off-odors: Milk odors gather just below the cover of the bulk tank. To properly check for off-odors, 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. Off-odors can be affected by:

1. Milk room odors.
2. Gasoline or diesel fumes adhering to clothing.
3. Smoking prior to checking the milk for odors or smoking in the milk room.
4. Eating or chewing aromatic candy, tobacco, medicine, beverages, foods, etc.
5. Highly scented shaving lotion, soap and other toiletries on the hauler.

1. Appearance of the milk: Some of the possible milk quality problems may become evident while checking the milk in the bulk tank for appearance. Any of the following defects would be sufficient reason to reject a tank of milk:

1. A small amount of bloody milk can give a large quantity of normal milk a reddish tinge.
2. Milk from cows with mastitis may show light flakiness or pronounced stringy curd particles. 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.
3. Other problems which may become evident while checking for appearance include frozen and partially churned milkfat. These problems, depending on their severity, may or may not be reasons for rejecting the milk. If in doubt as to accepting or rejecting the milk, notify the field representative and the producer.



2. Normal milk appearance: Normal milk color ranges from bluish white to golden yellow and is free from foreign or clotted matter. When checking the appearance of milk, make sure 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 identified on the sample container to inform the lab. Also bring this to the attention of the producer and the field representative to have this problem corrected.

3. Completely motionless when measuring: The milk shall be completely motionless when measuring. If the agitator is running when you arrive, start timing upon arrival. Wait at least five minutes for the milk to become completely motionless before measuring.

4. Preparing the measuring stick: To assure accurate measurement of volume, the measuring stick must be clean, dry and free of fat. To prepare the stick, wipe it dry with a clean, dry single service paper towel. Preparing the measuring stick in this manner will give an accurate reading.

1. Measuring the milk: The steps above have prepared the stick to be positioned into the milk. If there is any foam in the measuring space in the milk, gently move the foam away from the measurement area with the end of the measuring stick. Then lower the stick slowly into the milk until it reaches a point approximately $\frac{1}{4}$ inches from its proper position. Wait a few seconds and then gently lower the rod till it seats itself naturally. Remove the stick and read at once. Read the markings on the stick at eye level. Make at least two readings to ensure the correct weight and record the reading immediately on the weight ticket.



2. Measuring stick graduations: The measuring stick is graduated into 1/32 of an inch. Each graduation on the stick is equivalent to a determined number of pounds of milk posted on a conversion chart specifically calibrated for each tank. When the milk line is close to the graduation line but not exactly on the specific mark; always read it as if it were exactly on that mark. When the milk line falls exactly between two marks, always read to the nearest even number.

3. Bulk tank calibration: It is the responsibility of the producer under the direct supervision of the purchaser for the correct bulk tank calibration.

4. Correct agitation time: To collect an accurate bulk tank sample, correct agitation time is of utmost importance. The rule is five-minutes of constant agitation for a 100 to 999 gallon tank and 10-minutes for a 1000 gallon or more. If the bulk tank manufacturer has different agitation time with a permanent label affixed to the tank than stated here, then the milk hauler shall use the manufacturer's agitation time. Check your watch or timing device when turning on the bulk tank agitator. If the agitator is running when the hauler arrives, start the time then.

5. Taking the temperature: A milk hauler should take and record the temperature of the milk at each farm. The temperature should be cooled to 50F or less within four hours or less of the start of the first milking and to 45F or less within two hours after the milking is done. The blend temperature after the first milking and subsequent milkings should not exceed 50F (PMO). A high milk temperature can be a warning that the milk may have an off-flavor and it can also, indicate that the milk will have a higher bacteria count.



1. Bulk tank thermometer: Check the temperature of the thermometer that is on the bulk tank against the hand held thermometer at the first pickup of the month and record it on the milkroom pickup record. Inform the producer if the thermometer is incorrect. The bulk tank thermometer reading can be used in lieu of the hand held thermometer during the 30-day period if it is working and accurate.

2. The thermometer: Use a thermometer with a stainless steel stem, unbreakable plastic window and an external adjustment of calibration, with a dial range of 25F to 125F. Do not use a glass mercury thermometer because of the danger of breakage during use.

3. Sanitize the thermometer: Sanitize the hand held thermometer stem before taking the temperature of the milk with 200 ppm Chlorine or the equivalent, for one minute, every time before checking the temperature of the milk.

4. Sampling the milk: The first step in sampling the milk is to wash your hands at the hand wash sink in the farm milk room with soap and warm water and dry them with single service paper towels.

5. Identify the sample container: Identify each sample container with the producer number, the temperature, the date of pickup and the route number.

6. Proper agitation: Agitate the bulk tank for the proper time. If fat streaks are still in the milk after the proper agitation time, continue to agitate the milk until the fat streaks have been mixed into the milk.

7. Sample dipper: Make sure that the sample dipper is clean and has been properly sanitized in the 200 ppm chlorine solution or equivalent sanitizing solution. Keep the dipper in the sample dipper holder in the sanitizing solution until it is removed in the milk room to sample milk. Do not remove the sample dipper from the dipper holder prior to entering the milk room.



8. Opening the sample container: Open the sample container carefully so that you do not contaminate the interior of the container or the cap. Contamination of the container will alter the lab analysis.

9. Do not dip the sample container in the milk: If the sample container is used for the sample dipper, the permit will be suspended.

10. Rinse the sample dipper in the milk: Rinse the dipper in the milk at least twice before taking the sample and do not hold the sample container over the milk when pouring the sample.

1. Sample container three quarters full: Only fill the sample container $\frac{3}{4}$ full so that the sample can be agitated at the lab for proper analysis and pay close attention when closing the sample container to verify that it does not leak.

2. Care of the sample: Place the collected sample in the refrigerated sample case in ice water immediately and maintain the samples between 32F and 40F. Keep the sample case temperature at 32 to 40 degrees Fahrenheit until delivering the samples. Keep the tops of the samples above the ice and ice water.

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

4. The milk room hoseport: The transfer hose shall be brought into the milk room only through the hoseport.

5. Connecting the hose: Remove the cap from the bulk tank outlet valve and connect the transfer hose. If the valve is leaking, rinse out the milk with water and sanitize. Then connect the transfer hose to the bulk tank valve outlet.

6. Caution: Never open the bulk tank valve before the sample is taken. Doing so can possibly contaminate the milk with antibiotics if the truck has positive antibiotics on it from a previous milk pickup.



7. Pumping the milk: To keep the butterfat in the milk that may have clung to the side of the tank, leave the agitator running until the tank is half empty. Shut off the agitator before foaming or splashing begins to prevent product loss due to foam. Shut off the pump as soon as possible after the tank is empty to avoid sucking air and milk room odors into the tank truck.

8. No partial pickups: Pick up all the milk whenever it is possible. If the producer has finished milking and the tank has not completely emptied when the truck tank is full, return to the farm before the producer adds any additional milk. If not emptied, the bulk tank cannot be washed and sanitized before the next milking, nor would the samples and weight accurately represent the milk delivered. When returning to the farm to pick up the rest of the milk, another milk sample will need to be taken.

1. Checking for sediment: Visually check the bottom of the bulk tank for sediment and if excessive, make a note of it and notify the producer and the plant.

2. Disconnect the hose and rinse the bulk tank: Do not start rinsing the bulk tank while the hose is still attached. After the milk is pumped from the tank and the pump is shut off, remove the hose and cap immediately then rinse the interior of the bulk tank with warm water. Close the tank cover after rinsing to prevent the tank from drying out and to keep out any foreign material.

3. Milk room floor: Rinse the milk room floor to keep it clean and free of milk. Any milk remaining on the floor will start to erode the concrete.



4. Recording Results: Promptly record all results on the milk room card with the following information:

1. Date of collection.
2. Time of pickup including A.M. or P.M.
3. Milk temperature.
4. Measuring stick reading
5. Converted weight (milk weight)
6. Hauler signature or initials

5. Do the job correctly and do not hurry: Do a complete job and do not hurry. Also inspect the farm bulk tank while rinsing. If a buildup is noticed, notify the producer and the field representative.

6. Make it better: Before you leave the milk room, make sure it is in as good or better shape than when you arrived. Rinse the floor, hang up the hose and turn off the lights.

7. Plant bio-security: When delivering milk from farms to a processing plant, for bio-security reasons, it is best to stay out of the processing areas of the plant.

Violations prompting immediate permit suspension: A milk hauler violating any of the following shall have their permit suspended for the first full five weekdays following the violation. Administering the violation in this manner will allow a permitted field representative to ride with a suspended milk hauler and to perform all of the bulk milk pickup procedures which the suspended milk hauler shall not perform while their permit is suspended. This will also allow a dairy coop or a proprietary establishment the ability to recover the cost of the field representative while the field representative needed to work with the suspended bulk milk hauler.



The most serious violations:

1. Not measuring the milk before pumping the milk from the bulk tank to the bulk milk truck.
2. Not collecting a sample from the farm bulk tank.
3. Collecting milk from another container other than the farm bulk tank.
4. Not collecting a milk sample before pumping or opening the valve to the milk tanker.
5. Mixing the contents of the milk samples with other milk samples.
6. Collecting a sample before properly agitating the farm bulk tank.
7. Not using proper sample collection equipment.
8. Falsely identifying a milk sample.
9. Submitting a false or manipulated milk sample or false milk sample collection record.