

# **Bulk Milk Weigher and Sampler Training Manual**

Accepted procedures for  
collecting milk from farm bulk tanks

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## **Forward**

The purpose of this training manual is to thoroughly acquaint the bulk milk weigher and sampler with proper methods of loading, measuring, sampling and unloading bulk milk. The manual will better prepare the weigher and sampler to be more proficient which helps all aspects of Wisconsin's dairy industry. A weigher and sampler who does not follow the procedures in this manual is in violation of Wisconsin laws and regulations and subject to revocation of his or her Wisconsin bulk milk weigher and samplers license.

The training manual provides accepted practices and procedures for collecting milk from bulk tanks. Requirements of state laws and administrative rules are found in the following statutes and regulations:

- Wis. Statute § 98.146
- Wis. Statute § 97.21
- Wis. Admin. Code Chapter § ATCP 82 - Bulk Milk Sampling, Collection and Transportation
- Wis. Admin. Code Chapter § ATCP 65 - Milk and Milk Products

A training video is also available for viewing at <https://www.youtube.com/watch?v=EtYFU-CZSvs>.

Copies of the laws and regulations may be obtained by writing or calling:

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## **Definition of a Bulk Milk Weigher and Sampler**

A bulk milk weigher and sampler is any person who collects official milk samples and may transport raw milk from a farm, or raw milk or fluid milk products to, or from, a dairy plant, receiving station, or transfer station [Wis. Admin. Code § ATCP 82.01(1s)].

The weigher and sampler is more than just a truck driver. The weigher and sampler must:

- Grade the milk to verify acceptability and must reject all milk of unsatisfactory quality.
- Determine the amount of milk by using proper measuring techniques.
- Be the official collector of samples that are to be used to determine payment and quality of milk.
- Advise the producer about the quality of the milk.
- Have a keen sense of smell to recognize off-odors.
- Have good eyesight.
- Understand and follow proper methods of sample collecting.

- Be able to interpret results of official samples.
- Know the fundamentals of proper cleaning and sanitizing of milk contact surfaces.
- Have a good working knowledge of quality milk production.
- Be honest to both the producer and the plant.

The success of a bulk milk operation will depend upon the willingness of the weigher and sampler to accept responsibilities and perform the latest accepted procedures in collecting milk from farm bulk tanks.

It is strongly recommended that the prospective weigher and sampler train with a licensed weigher and sampler for a minimum of two weeks before taking the test, observing the legal practices of sampling and weighing milk by the licensed weigher and sampler, including stick reading.

## **Laws and Regulations that Apply to All Bulk Milk Weigher and Samplers**

Note: The term “Department” refers to the Wisconsin Department of Agriculture, Trade and Consumer Protection.

### **Wis. Statute § 98.146 Licensing Bulk Milk Weigher and Samplers**

All persons taking weights and samples of milk in bulk tanks or measuring milk in bulk tanks to determine weight, on the farm premises where such milk is produced, shall be licensed by the Department under this section, and no person who is not so licensed shall engage in such activities.

Each application for a license under this section or renewal thereof shall be made on forms provided by the Department and shall be accompanied by a fee of \$60 (and is subject to change). **No cash accepted**, fee to be paid by personal check, postal money order, or bank draft. Such license shall expire on September 30 biennially (two years). The applicant shall give proof of the ability to engage in such weighing and sampling to the satisfaction of the Department by passing a written examination and practical evaluation pertaining to such activities. A passing score and satisfactory practical evaluation must be obtained before the bulk milk weigher and sampler license can be issued. Any person holding a valid cheesemaker or buttermaker license under Wis. Statute § 97.17 is authorized to perform the duty of weighing and sampling milk without being required to have a separate weigher and sampler license.

No dairy plant shall receive any milk prior to the weighing and sampling by a licensee under this section unless it has been so weighed and sampled.

## **Laws that Pertain to Bulk Milk Weigher and Samplers**

### **Wis. Statute § 97.21(2) Bulk Milk Tanker; Grade A Permit**

“No person may operate a bulk milk tanker to transport milk or fluid milk products in bulk for sale or distribution as Grade A milk or Grade A milk products without a valid Grade A bulk milk tanker permit issued annually by the Department or an equivalent regulatory agency in another state for that bulk milk tanker. A Grade A bulk milk tanker permit is not transferable between

persons or bulk milk tankers. An application for a permit shall be made on a form provided by the Department. An applicant shall include with an application for a permit proof that the bulk milk tanker has passed an inspection conducted within the preceding year by the Department or an individual certified by the Department to conduct bulk milk tanker inspections. Except as provided in sub. (4), the Department may not charge a fee for a Grade A bulk milk tanker permit issued under this paragraph.”

### **Wis. Statute § 97.24(3) Rules**

"The Department, in consultation with the Department of Health Services, shall issue rules governing the production, transportation, processing, pasteurization, handling, identity, sampling, examination, labeling and sale of milk and fluid milk products; the inspection of dairy herds, dairy farms and dairy plants; the issuing and revocation of permits to milk producers and milk weigher and samplers, and of licenses to dairy plants and milk distributors."

Under Wis. Statute 97.24(3), the Department has issued Wis. Admin. Code § ATCP 65 (Milk and Milk Products [https://docs.legis.wisconsin.gov/code/admin\\_code/atcp/055/65](https://docs.legis.wisconsin.gov/code/admin_code/atcp/055/65)) and § ATCP 82 (Bulk Milk Collection, Sampling, and Transportation [https://docs.legis.wisconsin.gov/code/admin\\_code/atcp/055/82](https://docs.legis.wisconsin.gov/code/admin_code/atcp/055/82)) which are based on the Pasteurized Milk Ordinance (PMO) of the U.S. Food and Drug Administration (FDA) and the U.S. Public Health Services (PHS).

The PMO is a guideline which most states have adopted as their regulation for the production of Grade A milk and milk products.

### **Checklist Prior to Starting on the Route**

The bulk milk weigher and sampler must have certain supplies and equipment in order to satisfactorily perform the requirements of measuring, sampling, pumping and transporting the milk. A milk weigher and sampler shall wear clean clothes when measuring, sampling or collecting milk at a dairy farm. A milk weigher and sampler shall maintain a high degree of personal cleanliness, and shall observe good hygienic practices during all working periods. No milk weigher and sampler who has a discharging or infected wound, sore, or lesion on his or her hands or exposed arms may measure, sample, or collect milk at a dairy farm.

Before starting out, check for the following supplies and equipment:

1. The truck tank and transfer equipment have been properly sanitized. The responsibility to clean and sanitize the tank and/or pump of the farm bulk truck may lie with a plant employee. However, it is the bulk milk weigher and sampler's responsibility to check the tank and the pump to insure it is in sanitary condition.
2. The most recent wash tag must be attached. This wash tag should contain the following information:
  - ID number of tanker, including Grade A permit number
  - Date and time when the tanker was cleaned and sanitized
  - Name, location, and Grade A permit number of the facility where the tank was cleaned and sanitized.
  - Signature or initials of the employee who washed and sanitized the tank.
3. The following sampling equipment must be present on the truck:

- An adequate supply of sample containers stored in a clean enclosed container to prevent contamination of the sample containers.
  - Sample dipper.
  - A sanitizing solution of 100 ppm to 200 ppm chlorine or its equivalent in a covered dipper container. The milk weigher and sampler shall carry a sanitizing solution test kit to test the strength of the sanitizing solution.
  - Insulated sample carrying case with a rack to hold sample containers.
  - Adequate ice or other refrigerant to maintain sample temperature at 32-40°F (0 - 4.4°C).
4. A dial thermometer which is accurate to + 2° F. The thermometer shall be calibrated every six months and be labeled with date of calibration.
  5. A waterproof, indelible marker to identify samples when needed.
  6. A watch or other timing device.
  7. An adequate supply of milk weight tickets, and a pen to record the required information.
  8. Single-service paper towels.

### **Direct Ship Tanker Pick Up**

- The truck driver transporting the direct tanker from the farm to the dairy plant does not necessarily need to be a licensed bulk milk weigher and sampler.
- The receiving personnel at the dairy plant receiving a direct tanker load must include a licensed bulk milk weigher and sampler who is responsible for the organoleptic evaluation, temperature measurement, and official sampling at the plant.

## **Accepted Procedures for Picking up Bulk Milk at the Farm**

### **Step 1: Grading Milk Quality – Odor and Appearance Odor**

Milk must be graded by appearance and smell before it is accepted. The bulk milk weigher and sampler has to decide whether the milk has a good odor. If any off-odor is detected, the milk must be rejected. Off-odor milk from one farm bulk tank might spoil a full tank truck of milk. Any off- odors are likely to be carried over into the finished product. If there is any doubt in the weigher and sampler's mind about the acceptability of a tank of milk, a representative of the receiving plant should be contacted **before the milk is pumped into the bulk truck tank**. When grading for odor, the weigher and sampler should make this check through the port opening, or by raising the hatch, just long enough to detect possible off-odor.

It is important that the weigher and sampler not taste milk for flavor because of bacterial significance of raw milk. Nevertheless, the weigher and sampler should realize that if off-odors are found, off-flavors are also present.

Flavor is the most important factor in consumer acceptance of dairy products. Milk flavor control must begin on the farm. The odors or flavors most often found in milk at the farm are: feed, weedy rancid, barny and unclean, bacterial, salty, and foreign. The weigher and sampler must be able to recognize these odors and flavors and know the causes and prevention.

## **Feed Flavors**

Most green feeds and silage will give the milk a feed flavor if not handled or fed properly. Feed flavors enter the milk through the digestive system, respiratory system, and by direct absorption. Feeding cows silage during or just before milking causes an objectionable feed flavor in the milk.

Research indicates that most feed flavors are detectable in the milk and are usually most pronounced at the end of two hours.

Feed flavors that enter the milk through the respiratory system can usually be detected much sooner than those entering through the digestive system. If a cow breathes air with silage and barny odors, these flavors can be detected in the milk almost immediately. The flavors directly absorbed are less common but appear if the milk is left exposed for a long period of time.

Recommended controls:

- Put cows on pasture as early in the morning as possible.
- Feed silage after milking, never before or during milking.
- Keep mangers clean so that the barn will not smell strongly of silage. This can be done by feeding no larger quantity of silage than the cows will readily eat.
- Ventilate the milking barn properly.

## **Weedy Flavors**

Weeds, such as bitterweed, carrot weed, ragweed, wild onion, and many others, can give an off-flavor to milk.

Recommended control: Follow good pasture management and control undesirable weeds.

## **Rancid Flavors**

This flavor is sometimes described as bitter, soapy, or cowy. Much research has been done on the rancidity in milk, but there are still many unanswered questions. However, development of rancid flavor can usually be prevented.

Rancid flavor is caused by normal enzymes (lipase) in milk which alters the milkfat structure, releasing free fatty acids. There are two types of rancidity in milk; spontaneous rancidity and induced rancidity.

Spontaneous rancidity will develop with no apparent activation treatment. It is associated with late lactation, disease (mastitis), feed, and individual cows. These factors appear to make milk more susceptible to the development of rancidity.

Induced rancidity requires that the milk undergo certain activation treatments for rancidity to develop.

Factors that contribute to induced rancidity are:

- Agitation with incorporation of air or foaming of warm raw milk (caused by air leaks).

- Temperature or thermal activation-rewarming of previously cooled raw milk to 50°F (10°C) or above, and cooling to 40°F (4.4°C).
- Freezing.
- Excessive growth of psychrotrophs (bacteria which grow at low temperatures).

Recommended controls:

- Prevent unnecessary agitation and pumping of milk.
- When installing a pipeline milker, make sure there are no risers present and no air leaks.
- Make sure that the bulk tank has enough cooling capacity to prevent the blend temperature from exceeding 50°F (10°C) (blend temperature is the temperature of the combination of warm milk added to the previously cooled milk).
- Withhold milk from cows in late lactation.
- Do not hold raw milk for prolonged periods. Milk pickup should not be at a longer period than every other day.

### **Barny and Unclean Flavors**

These flavors are caused by unclean milking procedures, unclean milk equipment, and poor ventilation.

Recommended controls:

- Keep milk equipment clean.
- Follow good milking procedures.
- Ventilate the milking barn properly.

### **Bacterial Flavors**

Many off-flavors in milk, such as bitter, malty, medicinal, and sour, can be attributed to excessive bacterial growth. Poor sanitary practices encourage a buildup of certain types of organisms which can grow at lower temperatures and cause off-flavors. Good sanitary practices are essential even with the best cooling methods.

Recommended controls:

- Keep milking equipment clean and sanitize just prior to use.
- Follow good milking procedures.
- Cool the milk to 45°F (7.2°C) or lower immediately after milking.

### **Salty Flavors**

This off-flavor is usually attributed to milk from mastitic cows and cows late in lactation.

Recommended control: Withhold milk from cows showing early signs of abnormal milk and from cows in very late lactation.

### **Foreign Flavors**

These off-flavors can come from many sources such as chemical sanitizers, ointments used for treating udders, paint, fly spray, medicine, etc.

Recommended controls:

- The control of such off-flavors is a matter of careful handling of the above-mentioned materials so that the flavor or odor from them will not find its way into the milk.
- Use chemical sanitizers only in the concentrations indicated by the directions.

### **Appearance**

The bulk milk weigher and sampler must observe the surface of the milk in the bulk tank while lifting the entire lid of the bulk tank.

Milk which contains visible foreign matter, such as dust, insects, blood, chemicals, and any other abnormal material, is unfit for human consumption and must be rejected. Foreign matter in milk indicates poor milking practices; abnormal appearance shows milk from diseased cows.

The weigher and sampler should also observe any signs of churning (butterballs), freezing, and foaming of the milk. This must be reported to the farmer and receiving plant field representative.

### **Step 2: Reading and Recording Temperature**

The weigher and sampler must read and record the temperature of the milk at each farm. Milk in excess of 45°F (7.2°C) **shall be rejected unless** milk is collected within two hours after milking, then the blend temperature may not exceed 50°F (10°C). Some markets and plants require a temperature of 40°F (4.4°C) or less. Temperatures above 50°F (10°C) in the tank can be a warning that the bulk tank is not cooling properly and that the milk may have an off-flavor or high bacteria count.

Each weigher and sampler must have an accurate thermometer (certified accurate every six months) so that he or she can periodically check the accuracy of the bulk tank thermometer. **The weigher and sampler shall check the bulk tank thermometer at least once each month against his pocket thermometer and maintain a record in the milkhouse.** Be sure to sanitize the pocket thermometer stem in 100 ppm to 200 ppm chlorine or its equivalent each time before checking the temperature of the milk. If the bulk tank is not cooling properly immediately inform the plant and farmer.

- The temperature check, with the pocket thermometer, should be done after the bulk milk weigher and sampler's hands are washed and dried.
- Record the actual temperature of the milk found in the farm bulk tank.
- Reject all milk over 45°F (7.2°C), unless milk is collected within two hours after milking, then blend temperature may not exceed 50°F (10°C). Document on weight ticket if collected within two hours of milking and temperature is between 46°F (7.7°C) and 50°F (10°C).

### **Step 3: Washing Hands**

Once the necessary examinations of the milk have been made, the cap should be removed from the bulk tank. Examine the outlet valve for milk deposits and foreign material. If the outlet valve is found to be unclean or if the cap was missing, rinse, clean, and sanitize the outlet before proceeding. The milk hose and electrical cord for the pump (if the electrical outlet is located inside the milk house) must be brought through the hose port opening, not through the milkhouse

door. The bulk milk weigher and sampler must attach the hose in a manner so as not to contaminate the milk hose and the hose cap. The bulk milk weigher and sampler's hands shall be washed and dried immediately after attaching the hose and before measuring the milk.

The bulk milk weigher and sampler's hands shall always be clean while handling the milk or milk contact surfaces. Every milkhouse is required to have facilities for washing and drying hands.

The bulk milk weigher and sampler also should wear clean clothes. Dressed in this manner, the bulk milk weigher and sampler will be more careful while conducting pickup procedures and a good example will be set for all dairy farmers on the route.

#### **Step 4: Measuring the Milk**

Milk weights are based on a measurement taken by the bulk milk weigher and sampler. This is accomplished through the use of a graduated measuring rod. Each graduation is equivalent to a determined number of pounds of milk posted on a conversion chart calibrated for a specific tank.

Accurate measurement can only be obtained when the surface of the milk in the bulk tank is **motionless**. If the agitator is running when the weigher and sampler arrives, it must be turned off and allow the surface of the milk to become motionless before an accurate reading can be taken. A wait of 10 minutes may be necessary after the agitator is turned off before the milk can be measured accurately.

The sampler shall obtain an accurate reading of the bulk measuring stick by using a dry, clean stick at approximately room temperature (65-70°F, 18.3 - 21.1°C ). The stick shall be wiped dry with a clean single service paper towel.

Should there be any foam floating on the surface, gently move the foam away from the measuring area with the end of the measuring rod, before inserting rod. Remove the rod and read to the **nearest** graduation mark. If the reading appears exactly midway between two graduations, record the reading at the **even** number (National Institute of Standards and Technology).

After reading the stick, the weigher and sampler converts the reading to pounds of milk by using the chart provided by the bulk tank manufacturer.

Occasionally, changes will take place in or around the bulk tank which will affect the accuracy of a measuring rod. The weigher and sampler should be aware of these possible changes and when one or more of these are noted, the weigher and sampler must notify the farmer and the receiving plant.

#### **Factors Causing Weight Losses in Farm Bulk Tanks**

- Farm bulk tank not giving accurate readings.
- Incorrect calibration.
- Tank is not level.
- Heaving, cracking, or settling of milkhouse floor causing shifting of bulk tank.
- Distortion of a measuring rod bracket or seat.

Excessive milk weight losses may be caused by:

- Over reading or under reading.
- Poor measuring techniques.

### **Recording Information for Milk Quality and Value**

Acceptance of milk takes place when the bulk milk weigher and sampler withdraws the milk from the farm bulk tank. At this time, the farmer is entitled to information used to determine the quality and value of his or her milk.

The following information shall be recorded on the weight collection record (a duplicate copy shall be made with one copy left at the farm and the other taken to the plant receiving the milk.):

- Date and time
- Producer identification number
- Temperature
- Quantity of milk collected
  - Measuring rod reading
  - Conversion to weight
- Sampler's signature or initials **and sampler's license number** and expiration date

### **Sampling of the Milk**

The proper analysis of a sample of milk, whether it is for bacteria, fat, or any other test is dependent upon the reliability of the sampling procedure. To obtain a satisfactory sample, the sample must be representative. The procedure used in sampling must be done in a manner to prevent any type of contamination of a sample. The equipment used in sampling must be clean and dry and the samples should be stored in a manner to prevent any change prior to testing.

Adequate agitation, suitable equipment, proper sampling procedures, and refrigeration of the samples are necessary to provide a sample that is representative.

The bulk milk weigher and sampler shall take a representative fresh milk sample large enough to permit retesting by the dairy plant from each bulk tank prior to collection and delivery of a patron's milk.

### **Step 5: Agitating the Milk**

The bulk milk weigher and sampler shall agitate the tank to get a proper sample for fat and bacteriological determination. Milk shall be agitated for at least five minutes before taking a sample from a bulk tank less than 1,500 gallons, and for at least 10 minutes for tanks 1,500 gallons and over; or as specified by the tank manufacturer.

Since some tanks require longer agitation times before a representative sample can be obtained, butterfat tests that are abnormally high might be an indication that the tank is not being agitated long enough to obtain an accurate sample. The bulk milk weigher and sampler should check their watch when turning on the agitator, or if the agitator is running when the sampler arrives, timing starts at that point.

## Step 6: Taking a Sample

A sampling dipper must be used to aseptically transfer a sample of milk from the bulk tank to the sample container used to carry the sample to the official laboratory. This sample transfer instrument can be a straight seamless metal tube; long handled metal dippers; single service sampling tubes; or other means of taking samples aseptically. The dipper must be stored in a clean sanitizing solution of suitable strength.

Sample containers must be properly protected from contamination. All sampling containers shall be transparent. The container shall be clean, commercially sterile, and dry. Single-service transparent containers may be used for taking samples of fresh milk. Sample containers shall bear legible letters or numbers identifying each patron sampled, and date sampled. Fresh milk sample containers shall have a capacity of sufficient size to permit thorough mixing and hold a quantity large enough to permit two tests.

The sample case for shipping and/or transporting the samples should be a rigid metal or plastic case with insulation. It must have ample space for cracked ice or other refrigerants to cool the samples and keep them at 32-40°F until delivery at the laboratory. The sampling case should be supplied with proper racks to hold the samples in an upright position.

Sampling procedures at the dairy farm:

- Be sure your hands are clean and dry.
- Identify each sample container with the patron number and date.
- Make sure milk in tank is properly agitated.
- Do not sample frozen, partially frozen, lumpy, curdled, or churned milk.
- Remove sampling dipper from its container in the milkhouse. If a dipper is used for sampling milk, it must be cleaned and sanitized before use. The dipper shall be stored in a clean chlorine solution (100 ppm - 200 ppm) or other suitable sanitizing solution of equivalent strength between stops. The sanitizer test kit shall be used to determine if the solution is at the proper strength.
- Open sample container, being careful not to contaminate the container and/or the cap.
- Rinse dipper at least twice in the milk before taking the sample.
- When pouring the sample into its container, the milk weigher and sampler shall take care not to contaminate the sample or spill milk back into the open bulk tank.
- Do not overfill the sample container (fill to approximately 2/3 full). Excess milk in dipper shall be properly disposed.
- Always take a second sample of milk at the first stop of **each load** as a temperature control sample. Identify this sample as "temperature control" and show patron number, date, time, temperature of the milk in the farm bulk tank, and weigher and sampler's initials. This temperature control sample must accompany each set of samples collected until they arrive at the laboratory.

The sample dipper must be rinsed in clean tap water and stored in a sanitizing solution after each use.

### **Step 7: Refrigerating the Sample**

Promptly place the sample in the insulated sample case and keep it at 32-40°F (0 - 4.4°C) until delivered to the dairy plant. Provide a rack to keep the samples upright and to prevent them from being contaminated. Make sure the ice water is slightly above the milk level in the sample container, but the sample vial shall never be fully submerged in the water.

### **Step 8: Pumping Milk from Bulk Tanks**

If the agitator has been running during the pumping, it should be stopped when the level of the milk in the tank gets below the top of the agitator. This will prevent the possibility of product loss. Except as provided in Wis. Admin. Code § ATCP 82.10(11)(am) below, all milk from the bulk tank must be removed from the tank prior to the producer adding any additional milk to the tank.

**ATCP 82.10(11)(am):** Partial removal of milk from the bulk milk tank shall be permitted if all of the following apply:

1. The bulk tank is equipped with a seven-day recording device approved by the Department as specified in ATCP 65.16(3).
2. The bulk tank is cleaned and sanitized when emptied.
3. The bulk tank is emptied at least every 72 hours.
4. The bulk milk weigher and sampler indicates the time and date on the recorder chart when a partial pickup is made and when the bulk tank is emptied.

Milk may not be collected from any other container at the farm, except a farm milk bulk tank.

### **Step 9: Disconnecting the Hose**

The bulk milk weigher and sampler must make sure the tanker hose is disconnected before the tank is rinsed to prevent adulteration of the milk with water.

### **Step 10: Rinsing the Bulk Tank**

Rinse the bulk tank with cold or lukewarm water. This will aide in the removal of milk solid deposits in the bulk tank.

While rinsing the foam from the bulk tank, the bottom of the tank must be checked for sediment, churned fat, and coagulated or precipitated milk solids. Any abnormalities found should be reported to the milk producer and to the field staff of the receiving plant. The complete inside of the farm bulk milk tank, including the covers and bridge, must be rinsed with cold or lukewarm water.

**Any evidence that the tank was not properly washed after the last collection should be brought to the attention of the producer and the receiving plant.**

The outside of the tank and the milkhouse floor should be rinsed; the water hose should be stored so it is off the floor and protected from contamination; all lights should be turned off; and the milkhouse door closed before the weigher and sampler leaves the farm.

## **Unloading the Tanker**

The unloading of the tanker must be done in a manner so as to prevent contamination of the milk and to prevent the truck tank from collapsing.

Before milk can be pumped from the farm pickup milk tanker at the dairy plant, it is sometimes necessary to disconnect the hoses and pump. Proper care must be taken by the bulk milk weigher and sampler at this time to avoid contamination of any milk contact surfaces. Transferring milk from one tanker to another may be done only at a licensed facility.

While the milk in the tanker is being pumped out, the space occupied by the milk in the truck tank is being replaced by air from outside the tanker to prevent the truck tank from collapsing. In some cases, this outside air contains contaminants such as gas fumes, carbon, and dust which could get into the milk in the tanker. To avoid this contamination, the air entering the tanker shall be filtered. A filter must be placed over each vent(s) on the tanker. Other methods of utilizing filtered air may be acceptable.

## **Washing the Tanker**

The tanker shall be cleaned when emptied at least once every 24 hours of use. The tanker does not need cleaning between loads during the 24-hour period unless the previous load screened positive for antibiotic drug residue. Pumps and hoses that are not used for more than four hours between stops shall be re-cleaned and sanitized prior to use. The tanker shall be re-sanitized if it is not used for more than 96 hours. Cleaning of tankers, pumps, and hoses must be conducted in a Grade A permitted facility if the tanker will be used to transport Grade A dairy products during its next use. Wis. Admin. Code § ATCP 82.08 requires that facilities are made available to clean and sanitize tankers. To assure that this is being conducted, a tag bearing the name or initials of the person responsible for cleaning and sanitizing, the date, the name, and location of the washing facility shall be attached in the sampling compartment until the truck is washed after the following day's use, at which time it is replaced with a new tag. All tags or records are to be retained for a period of 15 days.

There are parts of the tanker that will need to be dismantled and manually cleaned each day; these include the milk pump and associated parts; the tanker hose and all connections; the manhole cover and its parts; and the stainless steel inlet to the tank compartment and its gaskets.

It is best to sanitize the tanker just before use to prevent any corrosion of stainless steel. However, in many cases, tankers are kept at locations remote from sanitizing facilities. In this case, noncorrosive type sanitizers are recommended. The tanker and its parts are sanitized immediately after washing, then the tanker and its parts are assembled with all inlets and outlets protected to prevent any contamination. If commingled or Grade B milk is picked up before picking up a load of Grade A milk, the bulk milk tanker must be washed and sanitized prior to picking up Grade A milk.

The tanker is now ready for another day's operation.

## Revocation of License

A bulk milk weigher and sampler license may be revoked or penalties may result for violation of Wisconsin's milk hauling and sampling regulation (Wis. Admin. Code § ATCP 82 – Bulk Milk Collection, Sampling, and Transportation). This includes if the bulk milk weigher and sampler does any of the following:

- Fails to ensure that the milk tanker is cleaned after each day's use and sanitized prior to next use.
- Fails to grade milk in a farm bulk tank as to its odor and appearance and fails to reject all milk which is abnormal in odor or flavor or that contains visible garget and extraneous matter.
- Fails to accurately take and record the temperature of milk or if the weigher and sampler fails to reject milk in excess of 45°F (7.2°C) unless milk is collected within two hours after milking. The blend temperature may not exceed 50°F (10°C).
- Fails to wash their hands before measuring or sampling milk.
- Fails to follow accepted procedures in measuring the amount of milk in the bulk tank, or if 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 milkhouse and one transmitted to the dairy plant.
- Fails to agitate the milk for at least five minutes in bulk tanks less than 1,500 gallons and 10 minutes in tanks over 1,500 gallons before taking a sample or if he or she withdraws any part of the milk from the tank before the sample is taken.
- Fails to take a sample for component testing and/or bacteria analyses in an approved manner with sanitary sampling equipment, of a sufficient size, in an approved container, properly labeled, and refrigerate the sample to maintain its temperature at 32-40°F (0 - 4.4°C).
- Rinses the bulk tank before disconnecting the hose.

## Laboratory Tests for Milk

Some of the more important tests run on milk are as follows:

**Component tests for payment:** Results of component tests (e.g. milkfat, protein) are used in determining the price paid for the milk sold.

**Bacteria count:** A monthly standard plate count is run on each farmer's milk to determine bacterial numbers. The number of bacteria found in a sample is usually an indication of the sanitary condition under which milk is produced and handled on the farm. Bacteria are tiny one-cell organisms so small they cannot be seen with the naked eye. They are colorless, of various shapes, and are found everywhere.

Because of the presence of bacteria on everything and everybody, contamination of equipment which comes in contact with milk must be avoided. This could happen when taking the measurement, collecting a sample, and/or transferring the milk from the tank to the tanker.

Bacteria increase in numbers by dividing and this process is dependent on three conditions: there must be food available, there must be moisture present, and there must be a favorable temperature.

All milk contains some bacteria. Food and moisture is present in milk, thus any bacteria in milk will multiply rapidly at a warm temperature but will not multiply as fast in cold temperatures.

The bulk milk weigher and sampler must not, through carelessness, add any additional bacteria to the milk supply. The weigher and sampler must also minimize reproduction by the bacteria already in the milk by maintaining the temperature of the milk samples between 32°F and 40°F.

**Antibiotic or inhibitory test:** Milk containing antibiotics and other drugs is considered to be adulterated. Inhibitory tests are run monthly to determine the presence of these materials in milk.

These materials could be residues of medicines used to treat the milking animals, such as an antibiotic and other drugs. They could also be residues of misused sanitizers.

These residues cannot be removed by processing procedures. Thus, their presence sometimes causes violent allergic reactions to some people and can also inhibit starter cultures used in the manufacture of dairy products. Producer must withhold all milk from cows that have been treated with antibiotics for a period as specified on the medicinal label.

**Sediment test:** This test consists of filtering milk through a disc and checking the amount of residue present. It is a rapid method to determine whether some careless practices exist on the farm.

**Pesticide residue test:** The use of improper insect killing materials on or near milk cows or the misuse of an approved insecticide in the milk production and handling area can result in residues of these materials showing up in the milk.

Only approved materials should be used and then used according to instructions on the container label. Lists of approved pesticide materials are available from the sanitarians, field representatives, and extension agents.

**Abnormal milk test:** Samples are collected monthly which are examined for the presence of milk from mastitic cows. Milk from cows with mastitis is considered abnormal milk and must be withheld from the market.

To determine if the milk is abnormal, a cell count is made on the milk. If the count is above 750,000 per ml, it is considered to be abnormal.

Udder irritation and mastitis (aka garget) can be caused by poor milking practices, improper cattle housing, improperly operating milking machines, or physical injury to the udder.

If the test results indicate the presence of abnormal milk, the producer should obtain professional help from their veterinarian. In all positive cases, a follow-up examination should be made by a qualified person to determine the cause and prescribe the method of treatment and/or correction.

**Test for added water:** Cryoscope measurement, an accurate analytical test, is used to determine the presence of water. Cryoscope measurement determines the freezing point of the milk. A

higher than normal freezing point indicates the presence of added water. These tests are so accurate that they are accepted as evidence in court.

### **Milk Quality Standards**

There are legal composition and quality standards for all milk. Standards include minimum butterfat and solids-not-fat content, maximum bacteria counts, and provisions prohibiting any level of inhibitory substances (antibiotics, sulfa drugs, sanitizers, etc.).

<b>Test</b>	<b>Grade A</b>	<b>Grade B</b>
Bacteria count	100,000 max	300,000 max
Somatic cell count	750,000 max	750,000 max
Antibiotics	Zero tolerance	Zero tolerance
Inhibitory substance	Zero tolerance	Zero tolerance
Pesticides	Zero tolerance	Zero tolerance
Added water	Zero tolerance	Zero tolerance
Fat	Not less than 3%	Not less than 3%
Solids-not-fat	Not less than 8.25%	Not less than 8.25%

Goat and sheep milk have different legal composition and quality standards.