



**Wisconsin Veterinary
Diagnostic Laboratory**
UNIVERSITY OF WISCONSIN-MADISON

Milk Sample Collection

Milk samples may be collected individually from affected quarters (quarter milk samples) or combined from multiple quarters of a cow into one sample tube (composite milk samples). Composite milk samples are not recommended however, as cultures usually reveal growth of numerous different bacterial species, making it difficult, if not impossible, to determine which are mastitis pathogens and which are environmental contaminants. Isolation of contagious organisms such as *Staphylococcus aureus*, *Streptococcus agalactiae*, or *Mycoplasma sp.* is indication of true infection of the udder; environmental organisms such as *Streptococcus spp.*, coliforms, *Staphylococcus spp.*, (coagulase negative *Staph.*), *Pseudomonas sp.*, *Corynebacterium sp.*, yeast, and fungi may be contaminants or true infections. Unless you are only screening for contagious pathogens, composite milk samples should be avoided.

Milk samples may become contaminated with bacteria from the hands of the sample collector, the environment, and the teat skin or teat canal. It is important that proper sample collection techniques are used in order to avoid contamination of the milk sample.

Here are steps to aseptically collecting milk samples:

1. Wash your hands and put on new disposable gloves.
2. Using a permanent marker, label a new sample tube with the date, cow ID, and the quarter that the milk will be collected from (RF for right front, LF for left front, RR for right rear, LR for left rear). Keep the sample tube closed until the sample will be collected.
3. Make sure that the udder and teats are clean and dry. Pre-dip the teats with an effective germicidal teat dip and leave the dip on for 30 seconds.
4. Wipe each teat dry with a single-use paper or cloth towel, making sure there is no teat dip left behind on the teat, as it will kill the bacteria in your milk sample.
5. Discard 3 to 4 streams of milk to minimize risk of contamination of the sample with bacteria in the teat canal.
6. Scrub teat ends with a cotton ball or gauze pad soaked in alcohol. Scrub until the cotton ball or gauze pad comes away clean. If sampling more than one quarter of the same cow, scrub far teats before scrubbing near teats. Use a new cotton ball

or gauze pad for each teat. Teats should not be dripping with alcohol, as the alcohol will kill the bacteria in your milk sample.

7. Open the sample tube immediately before the sample is taken. Do not let your hands or the teat end come into contact with the inside of the tube, including the lid. Collect milk until the sample tube is $\frac{1}{3}$ to $\frac{1}{2}$ full, holding the tube at an angle to prevent loose dirt or hair from falling into it. Immediately close the tube once filled.
8. Immediately put the sample tube in the refrigerator or on ice. Samples that will not be plated within 24 hours should be frozen. It is best to freeze samples before shipping to the lab.

Additional Tips:

- Plastic tubes with snap-on lids work best for collecting milk samples. Whirl pack and Ziplock bags should not be used as they are easily contaminated during sample collection and also often leak during transportation.
- To avoid contamination, handle sample tubes properly to ensure sterility at all times. Make sure nothing but the sample milk comes into contact with the inside of the tubes.
- Check that sample tubes are no more than $\frac{1}{2}$ full and that lids are completely closed to avoid leakage or bursting upon freezing (milk expands when frozen).
- Collect samples directly from teats. Bucket or milk meter samples carry over bacteria from previous cows.
- The best time to sample is at milking time before the cow is milked. If the sample is not collected at milking time, it should be taken at least 4 hours after the last milking.
- Label the sample tube with a permanent marker before sample collection as milk fat will cause the ink to smear.
- For composite milk samples, try to collect the same volume of milk from each quarter.
- Minimize contamination by collecting samples in a clean area, such as the parlor. Avoid areas with massive air movement where bedding and dust can cause major contamination problems.
- Make sure samples are cold or frozen until they are delivered to the lab to avoid excessive growth of bacteria, which can lead to misleading results.



Bulk Tank Milk Samples

Bulk tank milk cultures are a great way to monitor milk quality. They can determine the presence or absence of a bacterial group and identify predominant bacterial groups in bulk tank milk.

Here are some guidelines to collecting good bulk tank milk samples:

- Agitate the milk in the bulk tank for 5 minutes before sampling.
- Always collect the sample from the top of the bulk tank and never from the outlet as milk collected from the outlet is often contaminated.
- Use a clean sanitized dipper or sterile syringe to collect the sample.
- Fill the sample tube ½ full, as milk expands when frozen.
- Immediately place samples on ice or in the refrigerator. Freeze samples that will not be plated within 24 hours.
- Try to collect bulk tank milk samples 3-5 days in a row. This allows for greater accuracy than single day sampling for contagious pathogens.

Ruegg, P. L. On-Farm Culture and Treatment Decisions

<http://milkquality.wisc.edu/using-on-farm-culturing-to-improve-mastitis-treatment/>

University of Minnesota Veterinary Diagnostic Laboratory. 8/20/2014. Collecting Milk Samples

<http://www.vdl.umn.edu/services-and-fees/udder-health-mastitis/collecting-milk-samples/index.htm>

University of Minnesota Laboratory for Udder Health. Aseptic Milk Sample Collection

http://www.vdl.umn.edu/prod/groups/cvm/@pub/@cvm/@vdl/documents/content/cvm_content_483760.pdf

Using Bulk Tank Milk Cultures in a Dairy Practice

<http://www.nmconline.org/articles/bulktank.htm>

Procedures for Collecting Milk Samples

<http://www.nmconline.org/sampling.htm>