

Collecting Milk Samples for Microbiological Analysis

Mastitis is an economic concern for dairy producers because it decreases milk production, increases treatment and labor costs, and raises the risk of culling and bulk-tank antibiotic residues. Mastitis is also painful for cows, so it is important that producers are able to manage mastitis cases quickly and efficiently to minimize both the economic and animal-welfare concerns of the disease.

Microbiological analysis, or milk culturing, allows dairy producers to identify specific pathogens causing mastitis in individual cows. This can help producers find patterns of mastitis within the herd, develop specific treatment plans, alter mastitis control practices, and even reduce antibiotic use. Milk culture results often help producers, Extension professionals, and industry personnel resolve problems occurring at the herd level. Additionally, when contagious pathogens are present in a herd (*Staphylococcus aureus* or *Streptococcus agalactiae*), milk cultures can help producers make individual culling decisions.

Producers can culture their own milk samples on-farm or send them to a laboratory. This publication discusses the first step of collecting samples, which applies to either option. Following the proper sample collection procedures presented here will help ensure culturing results are accurate. Aseptic sampling procedures (preventing extra germs or bacteria) are necessary to ensure that the bacteria obtained from the culture is actually the one causing the mastitis.

Bacteria reside naturally on the udder surface, on hands, and around the milking parlor. If these bacteria get into the milk sample, the sample will be contaminated. If the bacteria identified by culture are not mastitis-causing pathogens or if more than three pathogen types are identified (which is highly unlikely to occur in just one udder quarter), the sample was contaminated. If the samples are not collected

properly, the results will be of no diagnostic value. Producers cannot develop viable treatment plans with contaminated results; they will have to obtain a second sample, prolonging a resolution even further.

Note: Labs typically test for commonly occurring mastitis pathogens, including contagious pathogens *Staphylococcus aureus* and *Streptococcus agalactiae*; environmental pathogens *Escherichia coli*, *Klebsiella* species, *Enterobacter*, and many species of *Streptococci* (including *Strep dysgalactia* and *Strep uberis*); and opportunistic pathogens in the coagulase-negative staphylococci group (including many *Staph* species, which are sometimes referred to as *Staphylococcus non-aureus* or CNS). *Mycoplasma bovis* is not typically included in a lab culture and often requires an extra fee. On-farm culture systems do not test for *Mycoplasma bovis*. If you suspect this pathogen on your farm, please contact your veterinarian for the best method to obtain these results.

Conclusion

Milk culturing allows producers to identify specific mastitis pathogens and make educated treatment and management decisions. Following this sampling procedure will help ensure the milk samples produce accurate results. Your veterinarian can help guide you through treatment decisions based on these results. Remember that these results can also be used at the herd level to make mastitis-reducing management changes, not just to decide on treatment for individual animals. Be sure to keep records of results and try to decipher patterns. Taking aseptic milk samples is the first step to obtaining information that can help identify areas for mastitis-management improvements and enable educated treatment decisions.

Materials Needed

latex or nitrile gloves (one pair per cow)
pre-dip
paper or cloth towels (one per cow)
cotton balls soaked in 70% rubbing alcohol
permanent marker
2-ounce or larger sterile pop-top or screw-on vials (one for each quarter of interest)

Procedure

1. While wearing clean gloves, apply pre-dip to teats that have been cleaned of manure, dirt, or sand.
2. Strip two to three streams of milk from each teat. This flushes the teat canal and reduces contamination risk.
3. Dry teats thoroughly with an individual paper or cloth towel, paying particularly close attention to the teat end.
4. While holding the top of the teat steady, wipe the end of the teat well with an alcohol-soaked cotton ball. Use as many cotton balls as necessary until the cotton ball still looks clean after using.
5. Open the milk vial and immediately take the sample, making sure not to touch the inside of the tube or bottom part of the lid. Hold the milk vial about 3 inches from the teat end and fill the tube half to three-quarters full of milk. Hold the vial at a 45-degree angle to prevent dirt from falling into the vial. Note: Do not place the teat inside the vial when sampling.
6. Close the lid immediately and label the top with the date, cow number, and quarter sampled. Cool samples immediately. Milk samples can be refrigerated for up to 2 days and can be frozen for up to 6 months. If mailing samples into a lab, mail them overnight on ice packs. If you intend to ship samples for somatic cell count evaluation, do not freeze the samples because the cells will burst and you will get a false reading.



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