Obtaining the Optimal Culture Results from Milk Samples

NDSU offer milk cultures for both mastitis and bulk tank sampling. The best results come from samples that are appropriately collected and either frozen immediately or transported on ice to the laboratory within 24 hours. Note: If Mycoplasma sp. are suspected Mycoplasma culture must also be requested.

Sample Collection:

Samples should be collected prior to milking. Please carefully follow the instructions below to avoid contamination.

1. Thoroughly wash and dry hands before handling udder.
2. Clean dirty udders and teats with a disinfectant solution (chlorhexidine or iodophor) and thoroughly dry with a clean paper towel.
3. Strip a few streams of milk (or a few drops from a dry cow) prior to sample collection.
4. Clean teat end with gauze or cotton moistened with alcohol and allow to dry. Use separate gauze or cotton for each teat end. Do not touch clean teat ends before the sample is taken.
5. Remove cap from tube and hold cap with open end facing downward. **DO NOT SET CAP DOWN OR TOUCH INNER SURFACE OF CAP.**
6. Keep tube at about a 45° angle and squirt 5-20 ml of milk into sterile tube. Immediately cap the tube. Do not touch the lip of the tube with teat end or fingers.
7. Only fill sample tubes about ¾ full. Larger volume samples are not required and increase risk of contamination.
8. Tighten cap and label tube. Immediately refrigerate or pack samples in ice after collection. Keep at 39º F (4º C) or freeze until delivered to diagnostic lab. A delay in cooling of as little as 15 minutes may cause overgrowth of pathogens by contaminant/normal flora bacteria, leading to inaccurate culture results.
9. Submit each sample in a sterile screw top container. **Rubber stoppered blood tubes and whirl-paks are not acceptable due to contamination issues.** Sterile screw top tubes are available at the VDL for a nominal fee.
10. Please notify the lab prior to collection if sending more than 12 samples. Notification ensures all necessary supplies will be available to process samples in a timely manner.

Interpretation of Results:

**Bacterial growth:**
Interpretations are based on the pathogenicity of the bacterium isolated and its quantity in the samples. In samples with more than one bacterial species only obvious (contagious) pathogens will be reported. Submission of multiple samples can increase the likelihood of identifying a causative agent.

**Contaminated Samples:**
Contaminated samples will be reported with comments indicating “no obvious (contagious) pathogen present” or “indicated the isolated bacterium”. Only contagious pathogens will be reported in contaminated samples; it is recommended that contaminated samples be recollected following the aseptic techniques described above.
Reasons for "No Growth" Culture Results

1. Traces of antibiotic or disinfectant in the milk inhibit growth of organisms.
2. Number of organisms below detectable levels (may occur with \textit{S. aureus}).
3. Improper handling or transport delay may reduce viable organisms to below detectable levels.
4. Organisms may have been phagocytized or cleared by the animal's immune system.
5. Infection is caused by organisms that either grow slowly or do not grow on routine culture \textit{e.g.}, \textit{Mycoplasma} sp., anaerobes, etc.