Calving Ease

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By Sam Leadley of Attica Veterinary Associates

Test, Don't Guess
Monitoring Bacteria Counts in "as-fed" Milk

- **Milk residues provide an excellent place for bacteria to grow and form biofilms.**
- **Biofilms on equipment are a common source of bacteria in the milk/milk replacer we feed to our calves.**
- **Contaminated milk (bacteria) can pose a significant health challenge for young dairy calves resulting in diarrhea and secondary respiratory infections.**
- **It is cost effective to regularly sample and culture "as-fed" milk in order to monitor the effectiveness of our sanitation practices.**
- **Practical sampling procedures.**

Milk residues = biofilms

What do you get if you combine lactose, fat and milk proteins on the surfaces of milk handling equipment? A great place to grow bacteria! All you need to do is add moisture and the right pH and temperature to get explosive growth. That is where biofilms come from. So, why should calf care persons care about biofilms?

Biofilms on equipment = bacteria in the milk we feed

Biofilms can be a huge reservoir of bacteria. Commonly found species on milk equipment are coliforms, Staph and Strep species. Think of mixing milk replacer in a 5-gallon bucket. If there are biofilms on the bucket surfaces hundreds of thousands of bacteria can be swept out of the biofilms into the milk replacer as the powder and water are blended together. Or, think of feeding milk from a contaminated nursing bottle and nipple. Again, tens of thousands of bacteria can emerge from biofilms as a calf nurses and the milk washes back and forth sweeping bacteria from contaminated surfaces.

High bacteria counts in milk challenge the calf immune resources

I don't know of research trials with control and treatment groups where the objective was to make calves have diarrhea by adding bacteria to their milk. Click HERE for a report on the effect of bacteria in colostrum on calf health. However, we do have considerable field experience that supports the connection between high bacteria counts in milk and calf diarrhea. Persistent feeding of bacteria-contaminated milk is almost certain to result in excessive rates of scouring calves. Even if the bacteria are not as pathogenic as coliforms (for example Strep species, Staph species), when they are present in overwhelming numbers there seems to be a suppressing effect on the calf's overall immune system associated with higher scours treatment rates.

You just can't look at milk and see bacteria – sample and culture

It is cost effective to regularly sample and culture "as-fed" milk in order to monitor the effectiveness of our handling and sanitation procedures. I recommend setting up some kind of regular monitoring of bacteria counts in milk/milk replacer. The frequency of monitoring should be set by the severity of scours challenge present.

What are practical sampling and culturing procedures?

For all kinds of housing and feeding methods remember these key points to collect useful "as-fed" samples of culturing:

1. Use a sterile collection container – similar to the ones used by the person that comes to the dairy to pick up milk. And, keep your fingers off the inside surfaces including the lid.
2. Reduce contamination while sampling by having clean hands or pulling on clean nitrile gloves.
3. Only fill the container ½ full. If it is frozen an overfull container will pop the lid and lose the contents when it thaws.
4. Once the sample is collected get it cold ASAP to reduce additional bacteria growth – I like to freeze them.
5. If non-saleable milk is pasteurized, remember to collect a sample of raw milk and one more directly from the pasteurizer discharge. These are for comparison to the "as-fed" sample results.

A. Group housed – automatic feeders An "as-fed" sample is obtained from a feeder nipple. Using the brand-appropriate method, force milk into the nipple and manually collect the milk. If practical, collect from a dry nipple or at least try to minimize contamination with calf saliva.

B. Group housed – mob feeders After adding the milk to the mob feeder and before the calves start drinking (yes, that can be tricky with them pushing and shoving) manually collect milk from one of the dry nipples.

C. Individually housed - bottle-fed After the bottles are filled and you are ready to feed calves it is time to collect samples. Before exposing the nipple to the calf, manually collect the milk from the nipple. If feeding bottles will take more than 30 minutes I like to sample the first and last bottle fed.

D. Individually housed - pail-fed The best "as-fed" sample is the one that the calf drinks. To do this remove the pail from it holder (away from the calf), add milk and pour milk from the pail into the sample bottle. A compromise method that misses the feeding-pail-based bacteria is to collect the milk as it goes into the pail. If the feeding will take more than 30 minutes I like to sample the first calf fed and last calf fed.

If milk replacer is mixed individually for each calf in her separate pail then I like to pour the "as-fed" samples directly from at least two different pails.

Resources on cleaning: At www.atticacows.com there is a Resources section with a drop-down menu. Click on Resources, click on Calf Facts Resource Library, scroll down to "Washing Milk Containers." There are two resources – a Checklist and a Protocol. Or, if you are reading an electronic copy, just click HERE for the Resource Library.

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