

Calving Ease

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Colostrum Bacteria Control



We know two things about colostrum and bacteria. First, that high bacteria counts in colostrum are not good for calf health. Second, in a farm environment it is not easy to minimize bacterial contamination of colostrum.

Steps in minimizing bacteria in colostrum

Step 1. Clean teats in the parlor. I recommend a two-step procedure. After brushing away loose debris, predip each teat. Wipe with a clean towel. Predip the teats again. Wait 30 seconds. Wipe with a clean towel being certain to scrub the ends of each teat. Why the second step? Especially to remove the accumulated manure in the depression that is often found on teat ends around the teat opening. Remember, that when the milker claw comes off no matter how poor a job is done in preparation all the teat ends will be very clean.

Step 2. Clean milker buckets including lids, valves and gaskets. This means that each time the bucket is used it is:

- A. Rinsed with lukewarm water,
- B. Brushed with hot chlorinated detergent solution,
- C. Rinsed with an acid solution, and
- D. Set up to dry.

If you want to take an extra step, rinse the bucket with a very hot strong chlorine solution just before use.

Step 3. Clean pails into which to pour colostrum as it is harvested. Just like the milker buckets, these containers have been cleaned after every use and sanitized just before this use.

Step 4. If milker buckets or pails are in the parlor, clean covers are used for every bucket before, during and after use. Think of these covers as “poop” barriers. Think of one Excedrin® tablet. That small a volume of feces can add up to 10,000,000 bacteria to colostrum.

Step 5. Prompt feeding of fresh colostrum. Our goal is to feed colostrum within one-half hour after collecting it. Why one-half hour? Why not one or two hours? To start with, most of the bacteria about which we are concerned will not start multiplying immediately. They have been introduced to a new growth medium, colostrum. It takes a while for them to get organized in order to grow. This period, a lag phase, is roughly one-half hour. If we can get the colostrum fed before that time is up we will not feed any more bacteria than the initial inoculation [By the way, “inoculation” refers to accidental contamination, not a deliberate effort to introduce bacteria into the colostrum.]

The reason we do not want to wait for one, two or more hours is that the bacteria most closely associated with calf diarrhea, coliforms, multiply rapidly. Doubling every twenty minutes at 95° (35°C), an initial

contamination of only 5,000 cfu/ml can blossom into 320,000 in just two hours. Clearly, feeding sooner is better than later.

Step 6. Prompt cooling of colostrum if it is to be stored. As with feeding, our time threshold is one-half hour. Our goal is to get the colostrum chilled to 60° (16°C) in the first 30 minutes after collection. Once the colostrum has chilled the time needed for the next doubling (generation time) has changed from 20 minutes at 95 degrees to 150 minutes at 60 degrees. For stored colostrum effective chilling is the key to a bacterial control procedure that works.

Several chilling methods work equally well. One procedure is to transfer colostrum into two-quart containers (nursing bottles, pitchers, jugs) and put them into an ice bath. As long as some ice is maintained in the cooling water this method will chill two-quart containers to 60 degrees in less than one-half hour. Then, these prechilled bottles can go into either a refrigerator or freezer.

Another approach is to freeze bottles of ice. Many farms use empty plastic bottles (from milk, soft drinks or water) filled about 3/4ths full of water. They must be clean on the outside. When frozen they are placed in a container of fresh colostrum at the rate of one-quart of ice to one gallon of liquid. When used at this rate the ice will chill any size container of colostrum to 60 degrees in less than one-half hour. I have found that this works even in hot summer weather.

One farm uses this method to extend the time until the chilled colostrum can be bottled and refrigerated by the calf person. At the end of the shift the milking crew replaces the initial ice bottles with fresh ones from the freezer. That keeps the colostrum chilled at close to 40 degrees for another 4.5 to 5 hours until it is convenient for the calf person to take care of it.

Step 7. Clean containers for feeding and storing colostrum. Just as clean milker buckets are important, it is equally important that we minimize the bacteria load in this equipment. Often we can substantially decrease bacteria that come from regrowth after cleaning by using a sanitizing rinse. While all equipment can benefit from the hot chlorine rinse, special attention should be given to esophageal tube feeders for rinsing. They include lots of places that are particularly hard to brush. These points are potential areas of regrowth between uses. The hot strong chlorine rinse not only directly kills bacteria but if plenty of rinse water is used we will lower contamination by simple dilution.

Step 8. Prompt feeding of warmed up colostrum. Our goal is to feed in less than one-half hour after it comes out of the refrigerator or one hour out of the freezer. Never let warm colostrum sit and culture lots and lots of bacteria. If we pull it out of the storage unit soon after the calf is born we will still be able to feed the colostrum within a reasonable interval after birth.

References: Murphy, S.C. and K.J. Boor "Sources and Causes of High Bacteria Counts in Raw Milk: An Abbreviated Review." Referenced on 11/28/07 at www.foodscience.cornell.edu/cals/foodsci/extension/upload/BactRawRev.doc. Leadley, S.M "Points to check for reducing coliform counts in colostrum." Referenced on 11/28/07 at www.atticacows.com in Calf Facts section.

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