

Colostrum: Lowering a High Coliform Count – A Case Study

- **High coliform bacteria counts in colostrum should not be normal.**
- **It is possible to feed colostrum with low coliform bacteria counts.**
- **Efforts to reduce coliform bacteria counts in colostrum must be a team effort – everyone has to buy into the goal of clean colostrum.**
- **It is most effective to focus on key critical control points:**
 1. **Clean teats on fresh cows.**
 2. **Clean collection equipment.**
 3. **Once colostrum is collected, feed promptly or cool rapidly for stored colostrum.**
 4. **Clean feeding equipment.**
- **Monitor, monitor, monitor with sampling and lab cultures.**

Yes, it is discouraging to get the lab culture results back and find high coliform bacteria counts in colostrum. However, there is good news! It is possible to deliver clean colostrum to calves. Read on to learn how one dairy achieved that goal.

The Case Study

Let us look at the situation for a dairy with serious health problems in young calves. At the first sampling of colostrum, we had six samples. Our industry standard for coliform counts in colostrum is no higher than 5,000cfu/ml. Below are the coliform counts (cfu/ml – colony forming units per milliliter).

Sample #1 = 38,000cfu/ml

Sample #2 = 278,000cfu/ml

Sample #3 = 54,000cfu/ml

Sample #4 = 125,000cfu/ml

Sample #5 = 46,000cfu/ml

Sample #6 = 27,000cfu/ml

In addition, all the standard plate counts were much, much higher (over 500,000cfu/ml).

What to do next? On one hand, we could have spent considerable time and money on more sampling and culturing. On the other hand, with high coliform numbers like these and such a wide spread from highest (278,000) to lowest (27,000) I concluded, “Knowing now that contamination levels are high, let’s just jump in with both feet and make some improvements.”

It is most effective to focus on key critical control point when searching for places to make improvements!

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To correct the situation we focused our efforts on these points:

- Clean teats on fresh cows
- Clean collection equipment
- Once colostrum is collected, feed promptly or cool rapidly for stored colostrum
- Clean feeding equipment

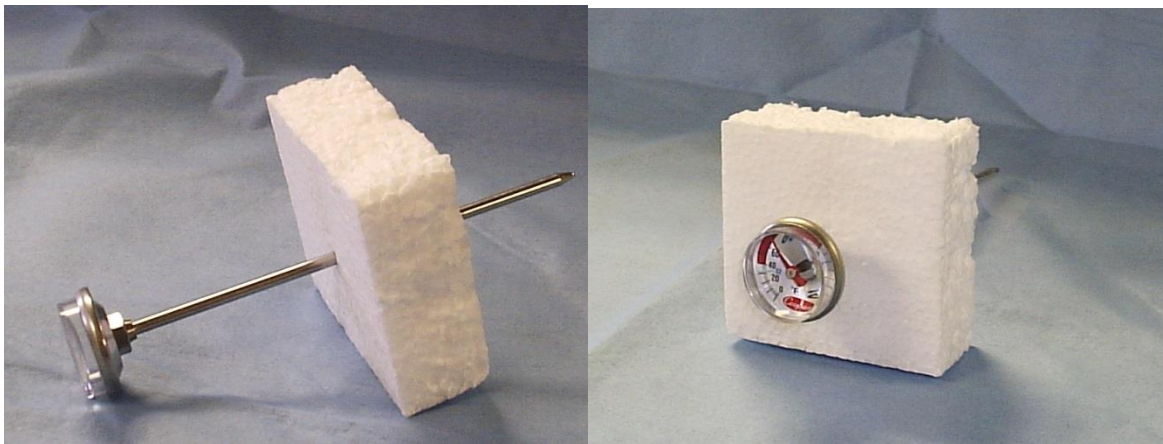
Teat Preparation

Teat preparation for fresh cows in the milking parlor was first. We met with all the staff that milked fresh cows. Each person was coached on a “dip-wipe-dip-wipe-scrub teat end” procedures. Each worker showed the parlor manager he could follow these rules.

Cleaning stainless steel collection buckets

One person was responsible for cleaning the stainless steel buckets used to collect the colostrum. Visual inspection showed significant areas of biofilm buildup on the inside of all the buckets. I made sure that there was a dry chlorinated detergent available for washing. In addition, we had on hand a stiff bristle brush, a green scouring pad and rubber gloves. We reviewed the “rinse-wash-rinse-dry” cleaning protocol. [Click [HERE](#) for this protocol in English, click [HERE](#) for this protocol in Spanish]

The dairy had plenty of hot water so keeping the wash water above 120°F (49°C) was not a problem. They use a simple floating thermometer now to monitor wash water temperature.



The insides of the buckets now shine brightly. Good.

Cooling Challenge

The dairy did not have the option of feeding colostrum right away after it was collected. Thus they needed to store it. The challenge, then, was how to cool the freshly collected colostrum rapidly enough to delay bacterial growth.

The parlor manager agreed to change his handling of the fresh colostrum. He had been waiting until all the fresh cows were milked and the parlor wash was started before taking the colostrum buckets from the parlor into the utility room. Then, these buckets would often sit there for an hour or more before being transported over to the calf barn. Once at the calf barn the colostrum was poured into 2-quart plastic containers and put into a freezer for storage. All of these delays amounted to too many opportunities for bacteria to grow, grow and grow so more.

A completely new approach to chilling colostrum was put into place. First, a chest-type freezer was added to the utility room. One-gallon jugs of water can be frozen in this freezer. As soon as each fresh cow is milked, the colostrum is now brought into the utility room and an ice-filled jug goes into each bucket of colostrum. This drops the colostrum



temperature to about 60°F (16°C) in roughly 30 minutes. At that temperature, coliform bacteria take about 2.5 hours to double just once rather than every 20 minutes at cow body temperature.

At the end of each milking shift all the colostrum is now transported to the calf barn where the chilled colostrum can go into the freezer.

Cleaning storage and feeding equipment

All the workers at the calf barn got together for training on cleaning storage and feeding equipment. Previous procedures did not include rinsing before washing. Nor, were they monitoring wash water temperature – it was only lukewarm on the day I checked it. They were using dishwashing liquid detergent without any chlorine – not good, if you want to effectively remove milk proteins.

We reviewed a standard washing protocol [same ones above in the section on cleaning the colostrum collection buckets]. Since most of the employees had Spanish as their first language, we had a native speaker explain the reasons for all four steps.

The success of this sanitation program was initially monitored by culturing sterile water rinse samples collected from the colostrum storage and feeding equipment. Starting in 2016 we began using a Luminometer with Ultra-Snap sampling tubes to get instant results on sanitation success from dry equipment surfaces.

Monitor, Monitor and Monitor some more

To track the overall success at all four critical control points every 3 months we collected five “as-fed” colostrum samples. These were cultured to assess success. After a whole year of adopting new practices the most recent results were all below the 5,000cfu/ml threshold.

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It is possible to feed low-bacteria-count colostrum!

Remember, too, when using colostrum replacers the same mixing and feeding equipment sanitation is a critical step in maintaining good calf health.