

Calving Ease

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What Level of Bacterial Contamination is “Normal” for Colostrum?

- Wisconsin research demonstrated increases in scours at levels above 10,000cfu/ml coliforms, 100,000cfu/ml total plate count.
- Leadley’s field experience suggests increases in illness at levels above 5,000cfu/ml coliforms, 50,000cfu/ml total plate count.
- In July 2012 Morrill and Others reported in a US study that 55 percent of colostrum samples from survey dairies had colostrum with total bacteria counts less than 100,000cfu/ml.
- In November 2016 Phipps and Others reported in an Australian study that 58 percent of the colostrum samples from survey dairies had colostrum with total bacteria counts less than 100,000cfu/ml.
- January 2107 Cummins and Others based on Irish data argue that levels below 100,000cfu/ml total plate count are unrealistic for commercial farms.

[cfu/ml = colony forming units per milliliter]

Why do we care about bacterial contamination of colostrum?

Briefly, sick calves. In more detail, we care because as bacterial contamination goes up there is a trend for:

- Rates of antibody absorption from colostrum to go down, and
- Treatments for diarrhea (scours) and respiratory illness (pneumonia) to go up.

So, what are realistic, cost-effective goals for bacterial contamination levels?

We all know about the law of diminishing returns. At some point our extra efforts to harvest and handle colostrum that is “bacteria free” will cost more than the returns we realize in better immunity and lower frequency of treatments among calves.

Dr. Sheila McGuirk’s work in Wisconsin measured both bacterial contamination in colostrum and health events among calves. She reported significant increases in diarrhea treatments at thresholds of 10,000cfu/ml coliforms and 100,000cfu/ml total plate counts. E. coli contamination issues were clearly linked to scours treatment rates. Contamination with Strep. species and Staph. species bacteria did not seem to increase scours treatment rates until they came up to the 100,00cfu/ml threshold. This research did not include an economic analysis of costs of colostrum handling procedures and benefits due to reduced treatment rates of sick calves.

My own consulting work supports Dr. McGuirk's work. Over and over again as I worked with dairymen to improve immunity transfer rates and reduce scours treatment rates I found that bacterial contamination of "as-fed" colostrum was a critical component of the solution. Sustained improvements in calf health were achieved as bacterial contamination rates fell below thresholds of 5,000cfu/ml coliforms and 50,000cfu/ml total bacteria count.

I have not completed a complicated assessment of every penny spent to achieve lower bacteria counts. Neither have I added up every dollar of the savings due to reductions in calf mortality and morbidity. Nevertheless, considering the benefits when death rates drop from 10-15 percent to 2-4 percent and scours treatment rates drop from 50 percent or higher to 10-15 percent it seems evident that following procedures based on basic microbiology, milk chemistry and bovine physiology will cost much less than the benefits realized.

Are dairies feeding low bacteria count colostrum (less than 100,000cfu/ml)?

The US national study found 55 percent of the samples met the quality threshold. The Australian study found that 58 percent of their samples met the quality threshold. The Irish study found that all of their pasteurized samples were okay, 74 percent of their fresh-fed samples were okay, and all of their stored samples (4°C, 13°C and 22°C: 39°,55°,72°F respectively) failed.

A number of dairies where I have consulted on either sickness issues or for "Calf Wellness" have been able to achieve persistently low levels of contamination.

Should we accept failure as "Normal?"

I argue that managing our calf enterprise with non-profitable procedures should not be considered the "normal" way to run a dairy. The barriers to having a low somatic cell count or achieving a high pregnancy rate can be overcome on a well-managed dairy. Similarly, the barriers to collecting clean colostrum and handling it to minimize further bacteria growth can be overcome with straight-forward common sense application of scientifically sound procedures.

How to make "Success" the new normal on a dairy.

- 1. Regularly sample and culture "as-fed" samples of colostrum.**
- 2. If culture results do not meet farm goals, identify procedures that will promote lower levels of bacteria inoculation and growth. For example, adopt effective cleaning protocols (click [HERE](#) for an example) and procedures for reducing inoculation rates (click [HERE](#) for an example).**
- 3. Build a team of individuals that are committed to producing and feeding high quality clean colostrum.**

References: Poulsen, KP, Hartmann, FA, McGuirk, SM "Bacteria in Colostrum: Impact on Calf Health" Abstract #52, Proc 20th Ann ACVIM 2002, p773. Morrill, K.M. and Others, "Nationwide evaluation of quality and composition of colostrum on dairy farms in the United States." Journal of Dairy Science 95:3997-4005. Phipps, A.J. and Others, "Survey of bovine colostrum quality and hygiene on northern Victoria dairy farms." Journal of Dairy Science 99:8981-8990. Cummins, C and Others, "The effect of colostrum storage conditions on dairy farm serum immunoglobulin G concentration and preweaning health and growth rate." Journal of Dairy Science 100:525-535.

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Remember to search for “Calves with Sam” blog for profit tips for calf rearing.