

Calving Ease

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Feeding Pasteurized Milk Tips for Success

- **Start with a superior product**
- **Clean, clean and clean some more.**
- **Post-Pasteurization Contamination is a common problem.**
- **Monitoring for bacteria in “as-fed” milk is essential for quality control.**

Start with a Superior Product

Only one of the dairies that I work with regularly uses milk from the bulk tank to pasteurize for their calves. It's a great product. Even before pasteurization the bacteria counts are very, very low. In addition, it has a consistent level of dry matter.

All the rest of them use waste or unsaleable milk (USM). On one hand, depending on the dairy, USM may have a bacteria count less than 10,000 cfu/ml. On the other hand, raw USM samples that go through our in-house lab often have bacteria counts we estimate to be over 500,000 cfu/ml. Scott and Others (2006, 2007) found that raw milk samples over 1,000,000 were not uncommon. While pasteurization can reliably lower the bacteria population (See Stable and others, 2001, 2004), James and others reported approximately 10 percent pasteurizer failures in their multi-state study of USM use on dairy farms. In addition all the waste products from killed bacteria are still present.

Another quality issue with raw USM is the potential for wide swings in dry matter concentration. As reported by Virginia Tech researchers (see [Virginia Tech Waste Milk Blog](#)) dry matters in unsaleable milk varied between 8 and 14 percent. Hill and Others (2009) reported a negative effect of daily variations of the volume of dry matter fed. It is possible to test USM and correct the dry matter concentration but compliance on this protocol can be a problem.

Clean, Clean and Clean Some More

Cleaning pasteurizing equipment is a given to make USM use practical. Fortunately, it is possible to both mechanize and automate this process. Both batch and high-temperature, short-time (HTST) units are sold with this kind of equipment in place.

Unfortunately, transfer equipment (pumps, pipes and hoses) by which the raw USM gets to the pasteurizer and is moved to a transport tank are not always part of an automated cleaning system. While on farm I have repeatedly found one or more pieces of equipment that are isolated. They have to be

cleaned separately from the pasteurizer. I recommend searching for some way to incorporate them into a wash system that cycles as part of every feeding – the successful cleaning is much better that way.

Post-Pasteurization Contamination

Transport tanks and their pumps and hoses seem to be the weakest link in preventing post-pasteurization contamination. Most of the rigs that I see that clean well are some kind of poly or plastic. They are designed to accommodate a sprayball-type mechanical cleaning unit. As long as these units are serviced regularly they consistently do a good job of maintaining a clean interior tank surface.

Where I see inadequate tank cleaning with these sprayball-type units is most often the fault of the water supply. When the wash cycle ends and the water is pumped out the discharge water temperature must be at least 120°F in order to remove milk solids effectively. If this water is discharged into a 5-gallon bucket or something similar it is easy to check the temperature with a rapid-read thermometer.

Another weak link in the sanitation process is often the pump and hose used to deliver the milk to calves. I always recommend including these parts in the cleaning process by having the pump run continuously during the tank wash cycle. Typically, if one runs the pump and props the feeding nozzle open so that it discharges back into the tank the pump, all hoses and the nozzle will wash with the same hot detergent solution as the tank.

Monitoring for Bacteria in “as-fed” milk

It should be routine to sample both raw and pasteurized milk. Have these samples cultured – find out how many of which kinds of bacteria are present. This monitoring should be more often when using USM than if bulk-tank milk is used.

In addition it is a best management practice to collect and culture “as-fed” samples from the first and last calf fed. On one hand, when the results show a big jump up in bacteria count between the “just-pasteurized” milk going into the tank and both of the as-fed samples we almost always have a tank cleaning problem. On the other hand, when results show a significant drop in bacteria count between the first-calf-fed and the last-calf-fed samples we almost always have a “pump-hose-nozzle” cleaning issue

References: Scott, M.C. and Others, “Waste Milk Supply and Pasteurizer Performance on Three North Carolina Dairy Farms” *Journal of Dairy Science* Vol 89, Suppl. 1, p128 #133 (2006) Scott, M.C. and Others, “Waste Milk Supply and Pasteurizer Performance on California Dairy Farms and Calf Ranches” *Journal of Dairy Science* Vol 90, Suppl. 1, p163 #134 (2007). Stabel, J.R. “On-farm batch pasteurization destroys mycobacterium paratuberculosis in waste milk” *Journal of Dairy Science* 84:524-527 (2001). Stabel and Others, “Destruction of mycobacterium paratuberculosis, salmonella spp. And mycoplasma spp. in raw milk by a commercial on-farm high-temperature, short-time pasteurizer” *Journal of Dairy Science* 87:2177-2183 (2004). Hill and Others, “Effect of Consistency of Nutrient Intake from Milk and Milk Replacer on Dairy Calf Performance” *Professional Animal Scientist* 25:85-92 (2009).

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