

Feeding Transition Milk and Colostrum To Young Dairy Calves

- **How to make feeding transition milk practical**
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What milk is “Transition” milk?

The very first milking is fed as “first-feeding” colostrum to newborn calves. **Most commonly the milk from the second, third and fourth milking is called “transition milk.”** There are some dairies that include the fifth and sixth milking as well. It can be blended with any first-milking that is either too low in antibodies to feed at first feeding or is excess. If colostrum is not checked for antibody concentration some farms put all of their heifer colostrum into this pool as well.

How to make feeding transition milk practical: collecting and handling

Is there some practical way to collect milk from fresh cows and store it separately? Some dairies bucket the milk from all the cows through the fourth, fifth or sixth milking. Other dairies with a fresh cow or special needs parlor have a way to divert milk from certain cows from the bulk tank. Robotic milkers can be programmed to divert milk from selected cows. On most dairies this is a relatively small volume of milk that can be handled in five-gallon pails.

Managing bacteria levels in transition milk is an absolute requirement. Keep bacteria out of the milk with clean teat ends and sanitized milker buckets. Coliform bacteria numbers can double every twenty minutes in cow body-temperature transition milk. One alternative is to feed it within thirty to sixty minutes after it is collected. Don't give bacteria an opportunity to multiply.

Another alternative is to store the transition milk in five-gallon pails, each containing a clean gallon jug of ice. Before feeding time it is necessary to plan on placing the pails of chilled milk into a hot water bath (please, not above 130 F or 55 C) for roughly 30-50 minutes. Ideal feeding temperature is 102-105 F or 39 C.

How to make feeding transition milk practical: feeding and changing to milk or milk replacer

The goal is to feed blended transition milk to the youngest calves starting at day 2. From the point of view of health and nutrition it can be fed as long as the supply will permit. My experience is that the supply usually ran out by the time I fed calves that were five to seven days old. To keep life simpler I chose not to feed it to calves beyond seven days of age even if I had greater volume.

When the supply ran short of a full seven days I fed it out as far as it would go. I placed a marker on the last calf's pen that received this milk so at the next feeding we could start changing her over to regular milk.

Once a calf had to be switched to regular milk I did not resume transition milk feeding for her the next feeding.

Some calf care persons choose to feed a fixed amount of transition milk each feeding (for example, two quarts). Since I had only about ten to twelve calves in this age range I could watch to see how much they would clean up – I fed twice daily. Once they cleaned up two quarts per feeding I slowly increased the amount fed feeding-by-feeding to get close to their appetite.

If these calves have diarrhea when an increasing volume of milk is fed other aspects of calf management should be reviewed – guidelines for this review may be found at www.calffacts.com, scroll down to “Feeding More Milk without Scours.”

Most of my calves were not enthusiastic about drinking regular milk for a feeding or two when they are switched off of transition milk. But, they began to drink their full amount of milk by the second or third day. Calf managers have shared with me that their experience changing to milk replacer was similar to what I saw with milk feeding.

Advantages of feeding transition milk and excess colostrum

Over sixty years ago Sutton and Kaeser demonstrated that extended colostrum feeding had a positive effect on calves. They observed:

“None of the calves receiving colostrum for 7 days showed any sign of digestive disturbance during the period of colostrum feeding. Weight

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records indicate more rapid gains in calves receiving additional colostrum.”
(p25)

Note that in this work after the third day calves received a blend of colostrum and milk. The comparison was between calves receiving whole milk and those fed this blend.

In the past decade work reviewed by Hammon showed significant advantages to extended feeding of colostrum. In this case “colostrum” was defined as milk collected in the first 72 hours post-calving. These advantages compared to milk replacer feeding included:

- Increased intestinal villus height;
- Increased intestinal crypt cell development; and
- Increased digestive enzyme activity in the small intestine.

These advantages lead to improved nutrient digestion and absorption.

Further, Hammon’s review noted that the “colostrum” calves vs. those fed milk replacer started to produce their own energy (endogenous glucose) sooner and in greater quantity.

What about “on-farm” experience with extended feeding of a mix of colostrum and transition milk to young calves? My own experience is the same as those experiences shared with me by other calf care persons.

When comparing “transition-milk” calves with those fed milk replacer the dairy may see these benefits:

- We could get calves to drink a larger volume per day more quickly;
- Fewer cases of scours requiring treatment in the first three weeks of life; and
- When calves did scour, the diarrhea was less severe and lasted fewer days.

A significant condition that is very often present in North American dairies is a nearly universal exposure to the parasite, *cryptosporidia*. This parasite challenge may be an important condition defining why transition milk feeding appears to have the benefit of reducing diarrhea problems among young calves.

Every time I ran short of this milk and had to cut calves off at three days or less I was reminded of the benefits. These “short-time” calves always seemed to be on my scours treatment list.

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However, all of these advantages seem to evaporate when newborn calves are exposed to many, many bacteria in the calving pen, through contaminated colostrum or in their housing unit. In other words, too many bacteria can easily override the advantages of both colostrum and transition milk feeding.

Disadvantages of feeding transition milk and excess colostrum

Depending on the farm there may be a number of practical barriers to collecting, storing and feeding transition milk. These include:

- the common practice of milking all cows with non-saleable milk into a parlor milk line thus avoiding bucket milking of any but very first milking cows;
- lack of means of chilling this milk rapidly so that it can be stored without undesirable bacterial contamination; and
- lack of means to warm chilled milk back up to calf body temperature for feeding.

In addition to working out ways to solve these challenges this feeding program will not work if the transition milk is contaminated with bacteria. This means extra attention to (1) clean teats in the parlor to prevent initial inoculation; and (2) careful and consistent cleaning of collection, storage and feeding equipment.

Further, each farm has to balance the extra labor cost of collecting and handling this milk with the expected reduction in labor and expense in dealing with sick, scouring calves during the first three weeks of life.

References: M.A. Steele and Others, "Dietary Factors Influencing the Development of the Ruminant Gastrointestinal Tract" Cornell Nutrition Conference, 2015, pp 79-88. Yang, M. and Others, "Colostrum quality affects immune system establishment and intestinal development in neonatal calves" Journal of Dairy Science 2015 7153-7163. Conneely, M. and Others "Effect of feeding colostrum at different volumes and subsequent number of transition milk feeds on the serum immunoglobulin G concentration and health status of dairy calves." Journal of Dairy Science 2014 6991-7000. T. S. Sutton and H.E. Kaeser, "Some Physiological Effects of Extending the Colostrum Feeding Period of Dairy Calves." Journal of Dairy Science 1946 29:13-26. H. Hammon, "Role of Colostrum on Local and Systemic Development in Neonatal Calves." ADSA Discover Conference, November 17, 2008 Roanoke, VA.