

Feeding Unpasteurized Milk to the Dairy Herd

Matt Akins – UW-Madison Department of Dairy Science
Liz Binversie – UW-Madison-Extension

In cases where a dairy producer is unable to ship their milk to a processor, this factsheet is to provide general information regarding the potential feeding of unpasteurized milk to the dairy herd. Before feeding unpasteurized milk, consult with your nutritionist and veterinarian or your local extension educator/agent. According to Wisconsin Department of Agriculture, Trade, and Consumer Protection (DATCP) regulations, milk can be utilized for animal feed by the farm on which it was produced, but it cannot be sold or distributed as animal feed unless the farm possesses a commercial feed license and the milk is labeled accordingly.

The most common disposal option for non-saleable milk is to dispose of the milk into a manure storage lagoon or land application since a dairy will not likely be feed all the milk produced by the herd. Guidance on storage and land application from the State of WI Department of Agriculture, Trade and Consumer Protection and Department of Natural Resources can be found at: <https://go.wisc.edu/35dfpk>.

Limitations to use

Disease transfer - Unpasteurized milk is a concern for spreading Johne's disease, Mycoplasma, bovine leukosis (BLV), Staph aureus and other diseases. If possible, pasteurization is encouraged to reduce disease transfer. Pasteurizer capacity is likely limited so prioritize pasteurized milk to young calves/heifers. Pasteurization of milk using batch pasteurization is 145°F for 30 minutes with agitation.

Moisture content – High water content (85-88% water) limits the amount fed in a total mixed rations (TMR). Usage in TMR is similar to using water to reduce dry matter content (10-15% of TMR as fed).

Milk storage and handling – Limited ability to store milk for longer than 1 day restricts possible usage. Pumps/hoses will be needed to add to the TMR. Farms likely would need to dispose of a portion of milk via the manure lagoon or direct land application as it is likely not possible to feed all the milk each day.

Diet spoilage/odors/flies – Unpasteurized milk added to the TMR may cause unpleasant odors due to microbial growth, especially in warm weather. Monitoring of feed intake and the TMR for heating and smell is needed. Consider adding a TMR preservative to control microbial growth and spoilage. Flies will also become an issue when adding milk to a TMR, with a feed-through insect regulator useful to control fly populations. Feed-bunk and equipment cleanliness is critical to minimize fly populations feeding on milk residues.

Feeding to Dairy Calves

Make gradual changes - Calves can consume up to 12 quarts of milk per day, however intakes must be increased over a period of 1-2 weeks. Greater milk intake will cause lower starter grain intakes so a 2 week weaning period with reduced milk feeding is needed to increase grain intake and rumen development.

Delayed weaning - Typical weaning times are 6-8 weeks of age, but these can be delayed to 12 weeks or possibly older to allow increased milk feeding and longer adjustment to starter grain.

Milk quality must be high – Keep bacterial loads low. Milk can be acidified with citric acid or preserved with potassium sorbate or sodium benzoate to minimize bacterial growth if not refrigerated.

Acidify or preserve milk – Acidification with citric or propionic acid or use of preservatives can reduce microbial growth of milk if not refrigerated. It is suggested to use acidified/preserved milk within 3 days to avoid excess bacterial growth. This would be most relevant for feeding calves due to the lower volume. A reference on acidified milk is available from Penn State Univ. (<https://extension.psu.edu/feeding-acidified-milk-to-calves>)

Feeding to Dairy Heifers and Lactating Cows (not dry or transition cows)

TMR inclusion - Farms that are using a TMR can include 10-15% of the ration mix as fed which reduces the dry matter content of the ration by about 5%-units. This would be similar to using water to reduce the ration dry matter and sorting. At 15% of the ration (as fed), this would provide approximately 16 lb milk or 2 lb milk solids (dry matter) per cow. Milk inclusion should vary depending on the ration dry matter content with reduced inclusion in wetter rations. Ration dry matter should not be below 45-50% as this can restrict intake and will cause greater spoilage.

Milk use per 100 cows - Total milk (heifers and lactating cows) per 100 cows on the farm would be about 1600-2000 lb at 15% inclusion rate.

Balancing nutrients provided by milk- Milk provides fat, protein, lactose sugar and other nutrients that should be accounted for in the ration. Work with your nutritionist to balance the nutrients supplied from milk with protein, fat and sugar or starch from other ingredients. See table below with milk nutrient contents.

Heat and odor - Monitor the diet for heating and off odors as the increased moisture will lead to additional microbial growth. Check dry matter content of forages and the TMR more frequently, and closely monitor feed intakes as spoilage will reduce intakes. Consider using an acid preservative in the ration to limit spoilage.

Table 1. Nutrient content of whole milk (liquid and dry basis) and amount of nutrients in 16 lbs of milk (approximate amount if including milk at 15% of ration as fed)

Nutrient	Milk nutrient %		Nutrients in 16 lb milk
	Liquid basis	DM basis	
Water	87.5%	0%	14.00
Protein	3.10%	24.8%	0.50
Fat	3.80%	30.4%	0.61
Lactose	4.90%	39.2%	0.78
Ash (Other solids - lactose)	0.70%	5.6%	0.11
Total Solids	12.5%	100.0%	2.00

Access online Milk Nutrient Composition and Amount Calculator: <https://go.wisc.edu/4mu07h>

University of Wisconsin-Madison Division of Extension, in cooperation with the US. Department of Agriculture and Wisconsin counties, publishes this information to further the purpose of the May 8 and June 30, 1914 Acts of Congress. An EEO/AA employer, University of Wisconsin-Madison Division of Extension provides equal opportunities in employment and programming, including Title VI, Title IX, the Americans with Disabilities Act (ADA), and Section 504 of the Rehabilitation Act requirements.