

Dumped Milk: Try Not to Cry Over it

In situations like this COVID-19 pandemic, the connectedness of our global food supply is made obvious. Much of our agriculture industry relies heavily on export markets and national supply chains to function. The dairy supply chain is no different in that aspect, and is perhaps, even more susceptible to this global shutdown than some others.

Many farmers have faced the reality of dumping a tank of milk at some point during their lifetime, but the current situation with COVID-19 brings uncertainty about how long this will need to happen and best management practices for dumped milk. Dumped milk does not have to be money down the drain, however. Milk can be used as a feed, typically only on the farm which it was produced; since local regulations prevent the sale of a 'raw' milk product. It can also be land applied as a fertilizer, as a typical farm is likely to have more milk than can be feasibly used as a feed source. Use of milk as a land applied nutrient source or disposal through the nutrient/waste management system should be done with consideration to your certified animal waste management plan (CWAMP, more [information here on that](#)) and under guidance from the NC Department of Environmental Quality.

Things to Consider:

- One limitation to using whole milk as a feed is the potential for spreading diseases. Johne's Disease, Mycoplasma, BLV, and others can be spread through unpasteurized milk. Thus, knowing the health status of your herd is essential. If possible, ***pasteurize the milk before feeding it.***
- Milk can be a great source of protein, fat, and minerals, however it is greater than 85% water. So, controlling the dry matter of the ration or TMR is very important. See [our tool](#) for calculating milk nutrients on a dry matter basis.
- Using large volumes of milk, either as feed or fertilizer, will take some ingenuity to get it from the tank to the field or feedbunk. All equipment used to do that will need to be cleaned regularly. If you have innovative ways to achieve this, ***reach out to us with details (ncdairyextension@ncsu.edu).***
- As the weather gets warmer, using non-saleable milk becomes more problematic. Spoilage and odors associated with microbial activity can decrease palatability of the milk to the cows but make it attractive to flies. ***Make a plan for storage***, based on how much you may use daily. Flies can be directly linked to other diseases like mastitis and pink eye, so you must be prepared to manage milk as a liquid feed.
- ***Notify your neighbors*** about land application to avoid further issues with odor.
- ***RECORD THE AMOUNT of milk*** that you dispose of with each tank or truck. Currently, there is no set method for documenting dumped milk for Dairy-RP or any state or federal assistance that will require verification for compensation. But, accurate records will be essential on the backside of this in the event that there is compensation for lost milk sales. More documentation than less is recommended for that reason. Date-stamped

picture(s) of the dipstick and when the milk valve is opened should accompany any written record(s) of date(s) and milk weight(s) for dumped milk.

Use as a fertilizer

In addition to the basic requirements to stay in compliance with your CAWMP ([information here on that](#)), there are several other situations that should be considered if milk is land applied or stored in the waste management system. If you find yourself in need of additional land for application, it is important to update your CAWMP to reflect any addition of land application sites using a temporary amendment. A temporary amendment is required if the producer applies the milk or if the producer pays for the land application to fields they are currently farming. If a third party hauler is receiving the milk for land application to fields not farmed by the producer, the export should be documented using the waste transfer form (TRAN-1).

It is strongly advised that you talk to your neighbors prior to discarding/dumping milk. There is a high likelihood that direct land application or storing milk in the waste management system will generate odors. Identify areas on the farm that are as far away from neighbors as possible, keeping in mind common wind directions. Identify neighbors who might be affected and discuss, in advance, the situation. This could prevent potential disputes and complaints. Clearly explain the situation and list all mitigation strategies that will be implemented to reduce odor.

In addition, land application rates to meet agronomic nitrogen requirements will be low. While application rates of manure may be reported in acre-inches, application rates of discarded milk will be in the range of several thousand gallons (i.e. 4,000 gallons of milk will provide 200 lbs of nitrogen). So, make sure you have a plan to accurately apply these low application rates if spreading milk directly onto pasture or crop land. Also, it is recommended that you make several low application rates instead of one, large application rate. This will prevent ponding on the soil surface, reducing the chance of runoff and odors. Fats can create films on hoses and nozzles creating clogs so make sure to clean everything well after use. If you plan to cultivate the soil for corn planting, consider applying prior to those activities and use this as an opportunity to incorporate the milk into the soil. Soil incorporation will greatly reduce the potential for runoff and odors.

Lastly, if you have an anaerobic digester, make sure you consult the manufacturer prior to adding any milk to your waste management system. Digesters require certain microbial communities to remain functional, and the addition of milk or any new feedstock could affect these microbes and reduce the efficiency of your digester.

If you have any questions relative to fertilizer or waste systems, please contact Steph Kulesza at sbkulesz@ncsu.edu.

Feeding non-saleable milk in a TMR or PMR

Before you pour milk on your ration, **call your nutritionist**. While milk can be an excellent source of protein in particular, milk is also full of fat, lactose, and minerals. It is not recommended to feed milk to close up dry cows or transition cows, as it can be difficult to produce a consistent ration and consistent mineral concentrations for those groups of cows.

Maintaining ration dry matter (%) is necessary for success. A TMR should be about 45-50% dry matter. Since milk is >85% water, using milk as feed is essentially like using water to reduce dry matter of your ration (while adding some nutrients).

Here's an example: if a cow is eating 100 lbs per day as fed TMR, adding milk at a rate of 10-15% of the diet dry matter would be adding 10-15 lb of milk or 1.5 to 2.25 lbs of total milk solids (based on 85% water, 15% solids), keeping total diet dry matter at 50%. That translates to 0.52 lbs protein, 0.60 lbs of fat, and 0.74 lbs of lactose (based on 15 lb as fed milk at 3.5% protein; 4% fat, 5% lactose).

To maintain rumen microbial health and to reduce heat load as we move into hotter weather, total fat (% diet dry matter) should be 6% or less. In the example above, feeding 15 lbs/d as fed milk (@4% fat) adds about 1% total fat to the ration. So, it is very important that you work closely with your nutritionist to monitor feed mixing, intake and cow performance if you choose to feed dump milk.

Feeding Non-saleable milk to calves and heifers

Using dump, waste, or non-saleable milk for feeding calves is a common practice on dairy farms. There are sure benefits to feeding whole milk replacers:

- Consistent nutrient supply
- Reduction of disease transfer
- Better storage, feeding, and labor time management
- Economics

Typically, in a good market, feeding milk replacer is a slightly greater cost than feeding waste bulk milk (based on \$18/cwt or greater mailbox price). But, the benefits often outweigh that cost.

However, when milk prices are low or you are in the middle of a global pandemic and find yourself with a few thousand extra pounds of milk, feeding that milk to calves can pencil out.

Our recommendations for milk feeding for calves are:

- 1.5 lb powder per day (minimum 15% solids) fed at least twice per day
- 26-28% protein
- 20-22% fat

Using the same example above, whole milk is >85% water, making that milk approximately 15% solids. In that instance, feeding 1.5 to 2 gallons per day (over 2 feedings) could be adequate nutrition for calves, depending on fat and protein concentrations. Table 1 offers a comparison of a standard milk replacer (28CP/20Fat) to bulk tank milk at 3.5% CP and 4% fat.

It is important to note that total solids of whole milk can range from 10-15% and nutrient composition of whole milk is not consistent from day to day, or even between milkings. If you

plan to feed your bulk milk to calves, a sample should be sent for analysis. At the very least, you can use your DHI (or other milk system) test results to estimate nutrient concentrations.

Table 1. Milk to Milk Replacer Comparison	Whole/Bulk Milk	Milk Replacer
Total Solids, %	12.70%	15.00%
Protein, %	25.20%	28.00%
Fat, %	35.43%	20.00%
Feeding Rate (gallons/day)	1.5	1.5
lbs/powder/day	1.64	1.94
Protein	3.26	3.62
Fat	4.58	2.59



Dr. Stephanie Ward, Dairy Extension Specialist, Department of Animal Science
North Carolina Cooperative Extension Service



Dr. Steph Kulesza, Nutrient Management and Animal Waste Specialist,
Crop and Soil Sciences Department
North Carolina Cooperative Extension Service