

Department of Animal Science

DISPOSAL OF EMERGENCY DUMP MILK DURING COVID-19 CRISIS

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BEFORE DOING ANY OF THE FOLLOWING OPTIONS

Record the date and volume for **all** milk that is dumped. Taking a picture of the dipstick and a picture of the milk valve open and dumping milk is recommended. This will give you photo evidence with a timestamp if documentation is ever needed. If you have the supplies to do so, take milk samples to test for components to verify fat and protein content. The documentation required for state and federal compensation, if it is offered, is unknown. A written record may be insufficient on its own, and extra documentation may help protect you.

Disposal of emergency dump milk: Beneficial reuse options

Feed Milk to Pre-Weaned Calves

- If you are not feeding milk from your tank to pre-weaned heifers, consider feeding whole milk instead of milk replacer. Whole milk will have a variable nutrient content compared to milk replacer but still provides calves with the fat, protein and nutrients required for growth and maintenance. Feed 5 to 6 quarts per day for large breed calves. Feed 3.5 to 4.5 quarts per day for small breed calves.
- Calves can consume up to 12 quarts per day, however consumption must be increased from their normal level gradually over a one to two-week period. Increasing milk intake can have benefits on first lactation production and calf health.
- Farmers may delay weaning up to 12 weeks unlike the typical eight weeks weaning we usually see. Farmers may want to use a step-down weaning approach to encourage grain intake and avoid a postweaning slump.
- If you have the ability to pasteurize your milk, consider doing this to decrease bacteria content in milk and risk of calf diseases. *Staphylococcus aureus*, Johne's disease, Mycoplasma and Bovine Leukosis (BLV) can all spread to calves through unpasteurized milk. Milk should be pasteurized at 145 F for 30 minutes with agitation.
- Ideally, milk should be fed to calves at a temperature between 90 to 100 F. During warm summer months, cooler milk will not harm calves by decreasing body temperature. It may

decrease calf intake and increase the amount of times calves nurse bottles or drink from buckets. Consider warming up milk from the bulk tank like you would bottles of colostrum.

- **Do not** feed waste milk (antibiotics, high somatic cell count, mastitic milk) to calves if you have milk from the bulk tank available.
- **Do not** hold milk for calf consumption for an extended amount of time without refrigeration. Bacteria counts will double every 30 minutes in room temperature milk.
- Acidifying whole milk can inhibit bacteria growth, but it does not “pasteurize” the milk. Acidifying the milk will allow it to be stored for a maximum of 24 hours. Unless milk is being left out in ambient temperatures for long periods of time (longer than a normal calf feeding with a bottle or bucket), acidifying the milk will be unnecessary.

Feed Milk in a Total Mixed Rotation

- Whey has been successfully added to dairy cattle rations, but little to no research exists on adding whole milk to the dairy diet.
- **Do not** incorporate whole milk into the ration without consulting your nutritionist. Adding milk to the diet will increase moisture content and can increase feed degradation in the bunk. We do not know whether adding whole milk will adversely affect palatability. Adding too much dump milk, or dump milk high in fat, could potentially decrease fat content in saleable milk.
- Adding whole milk into the ration will likely increase fly populations at the feed bunk. Consider adding a feed-through insect regulator to control fly populations. Bunk management and cleanliness will be critical to feeding whole milk in the ration.
- Adding whole milk into the ration will likely cause rancid odors in the feed bunk, particularly in warm weather and in bunks directly exposed to sunlight. Producers who usually feed one time a day may want to consider feeding twice a day to decrease feed exposure to heat and reduce odors.
- Consider acidifying milk that will be added to a ration (citric acid, propionic acid, sodium benzoate or potassium sorbate are generally perceived as safe). It may not be practical to acidify milk before adding it to the mixer wagon without a separate holding/mixing tank.

General Guidelines

- Raw milk can be included at 10 to 15 percent of the lactating cow and dairy heifer ration, but **not** with dry or transition cows. Ration dry matter should not fall below 45 to 50 percent because this will decrease feed intake and increase spoilage in the bunk.
- Nutritionists should consider the fat, protein, lactose sugar and other nutrients provided by milk when including it in the ration.

Nutrient	Milk Nutrient Percentage		Nutrients in 16 lbs. of milk (15 percent of ration as fed)
	Liquid basis (%)	Dry matter basis (%)	
Water	87.5	0.0	14.00
Protein	3.1	24.8	0.50
Fat	3.8	30.4	0.61
Lactose	4.9	39.2	0.78
Ash (other solids)	0.7	5.6	0.11
Total Solids	12.5	100.0	2.00

Selling Milk to Another Livestock Operation as Animal Feed

Farmers **must** obtain a commercial feed license **before** selling milk as an animal feed. The [feed application is available online](#) and requires the applicant’s name, address and signature in addition to a \$50 licensing fee.

Farmers must also submit a **label** including:

- Product Name (including brand name if applicable).
- Species of animal(s) intended to consume the product.
- Guaranteed Product Analysis (with all values reported in percentages by weight)
 - Crude Protein (minimum)
 - Crude Fat (minimum)
 - Crude Fiber (maximum)
 - Moisture (maximum). *In general, milk is 87 percent moisture and 13 percent dry matter.*
- Ingredients Statement (list all ingredients in descending order by weight).
- Directions for use (such as “for complete and balanced meals” or “for intermittent feeding as a treat or reward”).
- Name and address of the manufacturer or distributor.
- Quantity statement (net weight in English and metric units).
- Two additional requirements that are included for **Raw Milk**:
 - Species of animal from which the milk was obtained (Examples: Raw Cow Milk or Raw Goat Milk)
 - **Required Precautionary Statement: WARNING – Not for Human Consumption**

A [full list of the feed regulations](#) and an [example label](#) are available online at the UT Dairy website. During COVID-19, applications can be emailed directly to Bethany Henderson at the Tennessee Department of Agriculture (bethany.c.henderson@tn.gov). The Center for Profitable Agriculture also has an [online publication providing guidance](#) on selling commercial animal feeds.

Drying Off Late Lactation Animals Early

- If negative impacts to livelihood can be avoided, drying off low-producing cows (less than 40 lbs. of milk per day) near the end of their lactation (within 20 to 15 days of dry-off date) can be a strategy to decrease dump milk. Some industry experts are suggesting cows could be dried off three to four months before dry-off date. An abrupt dry-off is suggested along with traditional dry cow therapy and a teat sealant. Transitioning cows dried off early to a forage-only diet after dry off could be beneficial.
- Benefits of early dry off would include decreased labor to milk those cows, decreased lactating feed requirements for those cows, and decreased amounts of milk being dumped.
- If you have space for dump milk in your waste management and are being paid per cwt, this may not be the best strategy for you.
- If you do not have space for dump milk in your waste management system, this may be a beneficial strategy for you.

Disposal of emergency dump milk once all beneficial reuse options are exhausted

Exercise caution if you are approached about accepting a tanker of dump milk, as your farm technically becomes a solid waste disposal operation and the dump milk can be regulated as a solid waste rather than a farm waste. This practice will incur liability risk.

Placing in Manure Storage Systems

- If your dump milk is in a trailer and not the bulk tank, the best option for disposal is to drain the milk directly into your manure storage system, but only if you have existing storage structure capacity to accept the volume. One challenge this presents is getting the milk trailer in close proximity to the manure storage structure to completely drain the tank in a safe manner. If the truck cannot be positioned to drain the tank completely in a safe manner, consider adding additional drain hose before releasing to any type of drainpipe system such as the milk room floor drains.
- If your dump milk is in the bulk tank, the bulk tank can be emptied into floor drains, but only if they drain to a manure storage system, and only if you have storage capacity to accept the volume. Be aware that milk room drains sometimes lead to septic style drainage field treatment systems. **Do not** release dump milk into any type of drain field treatment system. Waste milk will solidify, block drain traps and ruin drain field treatment systems. If this method is used, as soon as the bulk tank is emptied you **must** use clean water to clear the traps and line of any remaining dump milk. Run clean water through the traps and line using a washdown hose at full flow for at least two to three minutes after dumping milk.

Direct Land Application

- If your farm operates under a Concentrated Animal Operating Permit, consult your permit terms and the Nutrient Management Plan filed with your permit to make sure you apply dump milk agronomically. Otherwise, use the land application worksheet in the Extension

publication [Dairy Manure Land Application Management \(Publication W840\)](#) to assist your planning.

- If you don't have capacity in your manure storage system, dump milk can be pumped from milk trailers and bulk tanks into liquid manure spreaders and directly land applied. You can use this disposal method to significantly reduce your crop production costs.

Nitrogen

- Dump milk organic nitrogen is not like manure organic nitrogen. Manure organic nitrogen is mostly derived from complex organic compounds in undigested feed. Manure organic nitrogen is slowly degraded by soil bacteria, so only about 35 percent of this nitrogen will be available during the current crop-growing season.
- About 95 percent of dump milk total nitrogen is organic nitrogen. This nitrogen is in the form of relatively simple proteins that are quickly degradable by soil bacteria, so the majority of dump milk nitrogen is available during the current growing season. Research has not been conducted to quantify availability, but it is reasonable to assume at least 70 percent of dump milk nitrogen will be available during the current growing season.
- Dump milk contains approximately 42 lbs.-total nitrogen per 1,000 gallons, or **30 lbs.-available nitrogen per 1,000 gallons.**
- It is best to apply to crops at seeding or to perennial forages. This maximizes nitrogen use, and runoff potential is greatly reduced with perennial forage.
- If corn silage will be produced with a yield of 25+ tons/ac, the nitrogen demand is 180 lbs.-N/ac. Apply dump milk at a rate of 6,000 gallons per acre at corn planting (180 lbs.-N/30 lbs.-available nitrogen per 1,000 gallons).
- It is wise to perform soil testing for corn silage to measure the nitrogen that does become crop available. You can make up any additional nitrogen needed as a sidedress of commercial nitrogen at the V6 growth stage.

Phosphorus

- Dump milk contains approximately **21 lbs-P₂O₅ per 1,000 gallons.**
- Assume 100 percent of the phosphorus in dump milk is crop available.
- At a dump milk application rate for high yielding silage (6,000 gallons/ac), approximately 126 lbs. P₂O₅ will be provided, which exceeds the phosphorus demand for medium testing soils.

Potassium

- Dump milk contains approximately **16 lbs-K₂O per 1,000 gallons.**
- Assume 100 percent of the potassium in dump milk is crop available.
- At a dump milk application rate for high yielding silage (6,000 gallons/ac), 96 lbs. K₂O will be provided, which meets half the potassium demand for medium testing soils.
 - The solids in milk are prone to plug valves, pipes and hoses in spreading equipment. **Rinse land application equipment with water after the application is complete.**

Land Application Precautions

- **Malodors** will be a serious challenge when directly land applying dump milk. Make certain that when dump milk is land applied, it is at agronomic rates on fields where decomposition odor will be least likely to affect nearby neighbors and public gathering places. If possible, use a manure injector to control odor.
- Dump milk is a highly concentrated source of nutrients and easily degradable organic matter. The Biological Oxygen Demand (BOD₅) is a test that measures the strength and impact of organic wastes on surface waters within a time period of five days.
 - Municipal wastewater will typically have a BOD₅ less than 500 mg/L.
 - Dump milk can have a BOD₅ of 100,000 mg/L.
 - **Fish kills can easily result if dump milk runoff from rainfall enters streams, rivers, ponds or other water sources during or after land application.**
 - **Avoid over-application that results in a point-source discharge. This practice could incur liability risk.**

Site-Specific Conservation Practices

- **Application Rate:** Follow spreading equipment directions to carefully target the agronomic application rate you have chosen. Don't apply more than 6,000 gallons/ac in one application event.
- **Application Timing:** Apply to agronomic crops as close to seeding as possible for dump milk, preferably within two weeks of planting. Apply to forages with the onset of favorable growth conditions or immediately after harvest when an additional harvest is expected.
- **Field Conditions:** Don't apply to saturated soil or steep ($\geq 20\%$) slopes.
- **Weather Forecast:** Don't apply if precipitation capable of producing runoff (1/4" + rainfall) is likely ($\geq 50\%$ local forecast) within 24 hours of the planned application time.
- **Setbacks/Buffers:** Don't apply within 100 feet of the downgradient sensitive areas including surface waters, ditches, open tile drains and sinkholes. If the sensitive area is protected by a 35-foot-wide vegetated buffer you can consider reducing the setback to the buffer edge.

Contacts for questions or farm-specific recommendations:

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