

Texas Dairy Matters

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Composting Cow Carcasses: A Practical Guide for Dairy Farmers

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Why Compost

When cows die, it is often a challenge to manage their remains. Burial can be costly in terms of equipment, labor and time, and becomes impossible when the weather is too wet or too cold. Incineration, hydrolysis or rendering may be unavailable or too costly. Leaving carcasses exposed to nature is the least favorable solution, as it jeopardizes the biosecurity of the farm. In Texas, it is legal to compost animal carcasses on-site, according to Title 30 Texas Administrative Code (TAC) §332.3(d)(2). Agricultural operations that generate and compost animal carcasses on-site are exempt from notification, registration and permitting. Proper composting can control odors, reduce pathogens and deter carrion-feeders, all in an economical manner.

It seems too convenient that a dead cow can just be placed in a compost pile. However, it isn't that simple. The challenge is that meat and bodily fluids decay much faster than manure and stalks. Bacteria in the compost pile work fast on these food sources and quickly use up all the oxygen. This causes the compost pile to fail and stink. Successfully composting cattle carcasses requires a suitable site, preparation of sufficient carbon sources, correct construction of the compost pile, and maintenance of the appropriate moisture and temperature levels throughout the process (Figure 1).



Figure 1. Texas A&M AgriLife brings you a video guide, illustrating how composting is professionally done. Dr. Zong Liu, Texas A&M AgriLife Extension Service, together with Jean Bonhotal, Cornell Waste Management Institute, shared their expert opinions on how to properly construct a compost pile, monitor it and utilize the finished compost. Scan the QR code to watch the video on YouTube.

Key Considerations

The ideal site for mortality composting piles is a dry and well-ventilated outdoor area away from public roads, water sources or residential/recreational areas. The pile will occupy the site for at least six months, and it must remain undisturbed.

A typical static compost pile is 5 to 6 feet high and less than 11 feet wide. It starts with a bowl-shaped woodchips base at least 18 inches thick to collect liquid and other byproducts. Place the animal carcass in the center of this base. It is a good practice to pierce the rumen to prevent bloating and potential explosion from the accumulating gases. Opening up or quartering a larger carcass will escalate decomposition. Cover the carcass with dry and carbon-rich materials such as old silage, wood shavings, dry stall bedding, bedded pack, hay/straw, chopped corn stalks or cobs, nut or seed hulls. The carcass should be surrounded by at least 12 inches of materials on all sides to ensure heating, reduce odor and discourage unwanted animals. From 3 to 5 cubic yards of carbon materials per 1,000 pounds of carcass will be needed. If necessary, create a continuous window for multiple carcasses.

Monitoring and Maintenance

The temperature, moisture, odor, unwanted animals and liquid coming from the pile (leachate) will need to be monitored. Monitoring temperature is the most crucial practice for supervising the composting process. A long-stemmed thermometer with a 3 or 4-foot probe must be used to check the temperature at the core of the compost pile. Measure the temperature at

various locations to determine its uniformity throughout the pile. A properly built pile should reach 130-160 degrees within two or three days and remain at this temperature for at least two weeks (Figure 2). At this temperature range, microbes will be able to efficiently break down the carcass, and the heat of the pile will keep away any unwanted animals. To check the moisture, grab a handful of the mixed material and squeeze it. It should feel like a damp sponge: moist but not dripping. The carcass may shift position when ripening inside the pile. Check the pile after the first few days of assembly to ensure the carcass remains well covered on all sides, or scavengers will take notice.



Figure 2. An active cow mortality compost windrow is steaming hot. The steam rising from the windrow is produced by microbes breaking down cow carcasses inside (left). An active windrow showing a core temperature of 155 degrees (right).

Utilizing Compost

Apply the compost to land on which it was manufactured at the proper rates for the crop. If it will be used on other land (special permission may be required by the Texas Commission on Environmental Quality), be sure to disclose the compost ingredients before the transaction is completed. The compost will likely contain clean bones free of flesh or skin. The bones can be reused as a base for a new mortality compost pile. Smaller bones can be incorporated into land applications.

References: Available upon request