

Chapter 15

Livestock Mortality Management

Josh Payne

Introduction

Livestock mortality is an issue faced by every livestock farming operation. Proper management of on-farm animal mortalities is vital for proper nutrient management and controlling disease. Improper disposal of dead animal carcasses, such as abandonment, may cause odor nuisance and the resulting leachate (carcass fluids) can negatively impact surface water and groundwater quality. If the animal died of an infectious disease, pathogenic bacteria and viruses may be present within the carcass. These pathogens can be spread by insects, rodents, predators and subsurface or aboveground water movement, as well as through direct contact with other livestock or poultry, leading to increased disease transmission risks. For these reasons, best management practices should be followed when reacting to animal mortalities. Furthermore, most states, including Oklahoma, have regulations requiring proper disposal of livestock and poultry mortalities making unacceptable practices such as abandonment illegal.

Common Livestock Mortality Disposal Methods

Burial

Perhaps the most common method of disposal is burial. When proper guidelines are followed, burial can be a safe option. However, poor site selection, such as sandy soils or areas with high water tables, may pose a threat to groundwater contamination. Studies have shown zones of nitrogen accumulation years following burial of livestock in pits. Furthermore, burial does not recycle nutrients for forage growth as carcasses are buried too deep for nutrient uptake by most plants. Oklahoma burial guidelines include construction of a pit at least 300 feet away from waterways and at least 1 foot above any floodplain level (Figure 15-1). Carcasses should be covered with at least 2.5 feet of topsoil af-

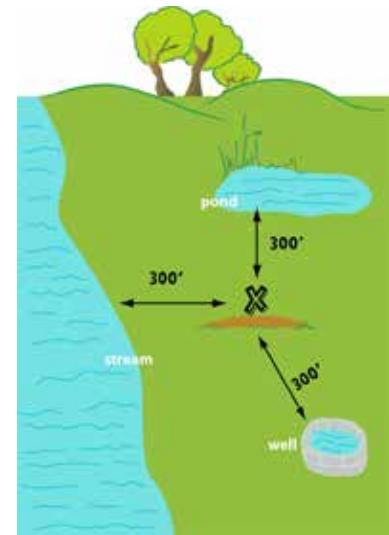


Figure 15-1. Site selection for burial.

ter placement in the pit. For more detailed information on carcass burial, refer to Oklahoma Statutes Title 21 Sections 1222 and 1223.

Landfills

Disposing of carcasses at a licensed landfill that accepts animal mortalities is another form of burial. Landfills may require notification before delivery and/or documentation from a licensed veterinarian stating the cause of death. Landfill tipping fees should be assessed and may range from \$20 to \$40 per ton. Other considerations are transportation costs and breaches of biosecurity by moving carcasses off-farm. As with burial, nutrients from the carcass are not recycled and increasing landfill volume is not a sustainable practice. For a list of Oklahoma landfills accepting dead animals, visit poultrywaste.okstate.edu

Incineration

Incineration is a safe and effective means of carcass disposal, especially from the standpoint of biosecurity. The carcass is completely consumed by fire and heat within a self-contained incinerator. This process destroys pathogens by achieving high

temperatures. Any remaining ash can be mixed with manure and land-applied following a nutrient management plan. Incineration is mainly designed for smaller carcasses and fuel costs should be considered. An air quality permit may be required. Due to odor and emission concerns, open air incineration is not allowed in Oklahoma unless the animal died of an infectious or contagious disease. It is often difficult to build an open fire hot enough to fully consume the carcass. Open air incineration should only be conducted during certain emergency disease management situations with regulatory permission.

Rendering

Rendering is a heat-driven process that cooks the product between 240 F and 290 F, while killing pathogens and converting the carcass into a value-added product such as an animal feedstuff. These feedstuffs, such as meat and bone meal, are generally used as pet food ingredients. Fat is another byproduct used to produce rubber, soap or biodiesel. Although rendering is a very effective method, currently, there are limited rendering services available. The transportation expense of collecting small volumes creates a financial obstacle for most rendering companies. Furthermore, federal regulations require that the brain and spinal cord be removed from cattle 30 months of age and older prior to rendering. This practice was implemented to further strengthen existing safeguards against bovine spongiform encephalopathy (BSE) disease transmission risks, but it has also increased processing costs for rendering plants. Some rendering facilities will still collect routine livestock mortalities, while some require the producer to transport carcasses to the plant. Fees may be associated with this service. Rendering can be a viable option, if locally available. Biosecurity and disease transmission risks should be considered when allowing vehicles on the farm and when transporting carcasses off-farm. Visit poultrywaste.okstate.edu for a current list of available rendering services.

Composting

Composting dead animal mortalities is an inexpensive, biosecure and environmentally sound approach to addressing the issue of carcass disposal. By definition, composting is a controlled biological decomposition process that converts organic matter into a stable, humus-like product. The carcass (nitrogen source) is buried in a bulking agent (carbon source), such as wood shavings, allowing for the

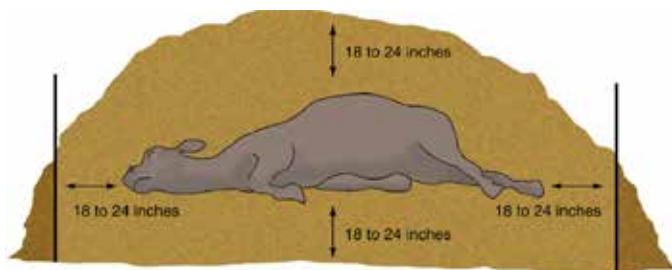


Figure 15-2. Livestock mortality compost pile.

proper carbon to nitrogen ratio (C:N) required by microorganisms to successfully decompose the carcass while absorbing excess moisture and filtering odor (Figure 15-2). The high temperatures (130 F to 150 F) achieved through proper composting will destroy most pathogens. Microorganisms will degrade the carcass leaving only a few small bone fragments, which are brittle and break easily. This valuable byproduct can then be land-applied as a fertilizer source, adding nutrients and organic matter to the soil, or recycled for new compost piles. Proper management is key for composting to be effective. As with burial, site selection is important. The site should be located in an area that does not pose a risk to surface or groundwater contamination.

Steps to Composting Livestock Mortalities

- Construct a barrier with livestock panels
- Prepare a carbon pad at least 18 inches deep
- Place animal in center, ensuring large carcasses are at least 18 inches from the pad edge and small carcasses are at least 12 inches from the pad
- Lance rumen to deflate gas buildup
- Add water until carbon source is damp but not wet
- Cover carcass with at least 18 inches of carbon material

Catastrophic losses are best composted in windrows of bulking agent due to the increased quantity of carcasses. Height, width and length of these windrows are dependent on the size and amount of carcasses to be composted. For both routine and catastrophic composting, piles must be appropriately managed to achieve proper decomposition and prevent scavenger invasion. Emergency management plans should be in place for catastrophic losses. With large numbers of mortality, more than one option may be necessary. For more information on livestock mortality composting, refer to Extension Fact Sheet, BAE-1749 On-Farm Mortality Composting of Livestock Carcasses.



Figure 15-3. Livestock mortality compost pile with barrier.



Figure 15-4. Brittle bone and humus-like material remains of a 700-lb stocker calf following 150 days of composting.

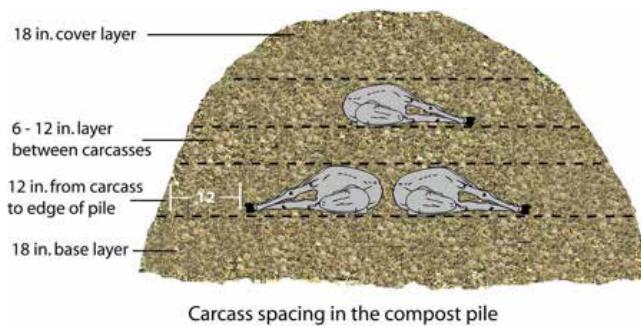


Figure 15-5. Carcass spacing for small stock. Illustration courtesy of Langston University.

Conclusion

Proper livestock mortality disposal is essential to the sustainability and environmental stewardship of farming operations. In addition, state laws regulate disposal methods. These methods should

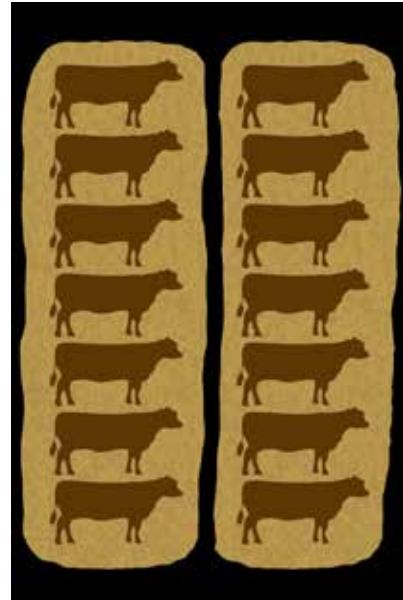


Figure 15-6. Windrow composting for multiple mortalities.

adequately dispose of animal carcasses without negatively affecting the environment, while remaining economical to the producer. Incineration, rendering and composting are common methods preferred for carcass disposal. Each method recycles nutrients, producing a usable byproduct. Local availability and cost may limit both incineration and rendering. When properly managed, composting livestock mortalities is a safe, effective option for most producers to consider.

References

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