

On-Farm Large Animal Mortality Disposal

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Animal agriculture is a major industry in Iowa and it is critical to address specific agricultural security challenges such as on-farm animal mortality disposal.

USDA rules implemented in January 2004 prohibit marketing of non-ambulatory cattle. This has increased the number of animals that must be disposed of through rendering or on-farm disposal.

FDA regulations of 2008 require rendering companies to remove the required specified risk material (SRM) to reduce the risk of any remaining bovine spongiform encephalopathy (BSE) in the United States. Some renderers have said they will no longer pick up dead cattle more than 30 months of age because they cannot do the required SRM removal.

Animal mortality also referred to as death losses may be classified broadly as either catastrophic or routine. Catastrophic mortalities involve a larger number of death losses within a distinct time period and result from a single event such as a barn fire, natural disaster, or epidemic disease.

Catastrophic mortality composting information is provided by Dr. Tom Glanville (retired), Department of Agricultural and Biosystems Engineering, Iowa State University, on the website <http://www.abe.iastate.edu/cattlecomposting/>

A scientific assessment of the predominant methods for catastrophic mortality disposal is found in the Council for Agricultural Science and Technology (CAST) Issue Paper number 41, 2009 at <http://www.cast-science.org/> (search for "mortality" under title or keyword)

Catastrophic mortality must be reported to the Iowa Department of Natural Resources (IDNR) 24-hour emergency response line 515-725-8694.

Routine animal mortalities represent a small proportion of overall herd size and are expected to occur and fluctuate throughout the normal course of production. This fact sheet addresses only routine large animal mortality disposal.

Iowa law requires animal mortality to be properly disposed of within 24-hours after death. Approved Iowa on-farm animal mortality disposal methods are burning, burial, rendering, and composting.

Burning or incinerating animal mortalities can only be performed in an engineered incinerator. Homemade incinerators may not be used. Open burning is also **not** permitted.

Burial can be only on the premises where the animal mortality originated. Burying many large animals requires high-capacity earthmoving equipment not found on most livestock farms and during at least 25% of the year frozen soils make burial difficult.



Recent IDNR geographic data analyses indicate that shallow groundwater, exposed bedrock, or other environmentally sensitive situations make large-scale burial undesirable in about 40% of Iowa.

Burial must be no greater than 6 feet deep with a minimum of 30 inches of soil cover, be in well drained soils and at least 2 feet above the highest groundwater elevation.

Burial must be at least 100 feet from a private well, 200 feet from a public well, 50 feet from an adjacent property line, 500 feet from an existing inhabited residence and 100 feet from a stream, lake or pond. Burial cannot be in a wetland, floodplain or shoreline area.

Burial concentration is limited to 7 slaughter or feeding cattle, 44 butcher or breeding hogs, 73 sheep or lambs or 400 poultry carcasses per acre per year. All mortalities must be covered immediately with six inches of soil and finally with a minimum 30 inches soil cover when the burial pit is finished.

Rendering industry consolidation has increased the haul distance making transportation more expensive and potentially in short supply. The required SRM removal implementation has added costs and has eliminated many rendering companies.

If burning, burial, or rendering are not workable options at your location, contact your local sanitary landfill to determine whether they accept animal mortalities.

On-farm composting On-farm composting is a natural process for animal mortality disposal that is being utilized by an increasing number of producers. The process requires only a site to compost, bulking agents or co-compost materials to absorb moisture and reduce odors, and minimal labor to construct the compost pile.

An envelope of bulking agent is placed around the animal mortality as the compost pile is built. The biological process of composting will manage itself if the pile is constructed properly. Temperatures in the pile will range from 130-160 degrees F, which will kill many pathogens. The total process time varies depending on the size of the carcass and will probably take between 6 and 12 months for cattle carcasses.



Diagram 1: Cross-section of Compost Pile or Windrow

Iowa DNR (Department of Natural Resources) recommends producers compost properly and follow state regulations for animal disposal to avoid environmental problems.

Routine mortality composting method is **not** intended for the disposal of animals infected with foreign animal diseases.



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Iowa DNR Recommendations

Requirements for composting are listed in the Iowa Administrative Code Environmental Protection 567 Chapter 105.3 for [general requirements](#) and Chapter 105.6 for [specific requirements](#).

This is a summary of requirements:

- 500 feet from inhabited residence.
- 200 feet from public wells.
- 100 feet from private wells.
- 50 feet from property lines.
- 100 feet from flowing or intermittent streams, lakes or ponds.
- Outside of wetlands.
- Outside 100-year flood plain.
- Incorporate animal mortality into the compost pile within 24 hours.

- Base layer of bulking agent under the carcasses shall be 12-24 inches thick.
- Maintain a cover of bulking agent 12-18 inches thick over the carcasses (check frequently and add cover as the pile settles and shifts.)
- Composting must be done in a manner that prevents runoff and leachate, and controls odors, flies, rodents, and other vermin.
- Dead farm animals shall not be removed from composting until all soft tissue is fully decomposed .
- Storage of finished compost shall be limited to 18 months.
- Finished compost shall be applied to cropland in a manner that minimizes the runoff into a water of the state.

Recommended Bulking Agents

Raw materials used for co-composting can be mixed to improve the structure and porosity of the bulking agent. These materials should be readily available, inexpensive, and free of pesticide residues. The co-compost material should provide air movement, yet insulate the process to maintain warm temperatures.

Some commonly used bulking agents are:

- Poultry litter.
- Turkey brooder litter.
- Hoop barn manure/bedding.
- Ground corn stalks.
- Ground corn cobs.
- Wood chips.
- Coarse sawdust.
- Mature dry corn silage.



Bulking agent should provide 12-18 inch thick cover over all parts of the carcass at all times.
Photo credit: ISU Extension and Outreach.



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Construction of Compost Pile/Windrows

- Width 15-20 feet wide
- Base Layer 12-24 inches minimum bulking agent thickness to absorb excess moisture from the carcasses and prevent runoff
- Animal Layer Single layer. Never stack or layer large animal mortalities
- Cover Layer 12-18 inches minimum of bulking agent (mound shaped) to control mortality leachate and odors and to discourage access by scavenging domestic and wild animals. Piles will settle and shift with time, check cover frequently and add cover if any carcass parts become exposed or cover thickness decreases



Will there be bones?

The simple answer is yes. All the soft flesh will be completely decomposed when the composting process is complete. Many bones will be soft or brittle, but large bones will remain. Most bones will crumble when land applied.

Photo credit: ISU Extension and Outreach



Mortalities should be placed on a base layer 12-24 inches thick of the bulking agent.

Photo credit: ISU Extension and Outreach

Operation and Maintenance of Compost Pile/Windrow

- Recommend monitoring internal pile temperature every few days (~130^o-160^oF indicates active process.)
- Turning the pile or windrow is not necessary and should not be done before four months.
- Inspect regularly and add bulking agent to maintain 12-18 inches of cover (critical for odor, fly and scavenger control).
- Plan for 6-12 months of composting time.
- For additional advice, contact your ISU Extension and Outreach Ag Engineer, Iowa Beef Center, or Iowa DNR field office.

Iowa DNR Field Offices

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