



## On Farm Mortality Disposal Options for Livestock Producers

Jason Carter, Animal Science Extension Agent

Bobby Clark, Crop & Soil Science Extension Agent

Greg Evanylo, Professor and Extension Specialist, Crop & Soil Environmental Sciences

Alicia Ketchum, Environmental Engineer, USDA, NRCS

Bob Peer, Agricultural Program Coordinator, Valley Regional Office of DEQ

Doug Saunders, Deputy Director, Division of Animal and Food Industry Services

Graham Simmerman, Regional Waste Program Manager, Valley Regional Office of DEQ

Crystal Smith, Animal Science Extension Agent

Mark Wahlberg, Extension Animal Scientist, Animal & Poultry Sciences

### Introduction

All livestock producers at some point are faced with decisions regarding how to dispose of livestock mortality from their farm. Each option has its own benefits and limitations based on accessibility, regulatory restrictions, expense, and biosecurity concerns. Livestock producers should also know that it is their responsibility to dispose of dead animals within 48 hours by one of the approved methods highlighted below. There are approved and preferred methods of animal mortality management according to the Department of Environmental Quality (DEQ). Farmers should choose the option that best suits their farm's mortality disposal needs.



### Hierarchy for Animal Mortality Management from DEQ

The distribution of animal disposal options available to farmers varies across the Commonwealth. A hierarchy of animal disposal options has been developed to formally recognize DEQ's preference for environmentally sound animal mortality management in Virginia. The preferred order of mortality management options that should be implemented are:

- 1) Rendering- to recycle animal mortality into useful products in commerce;
- 2) On-site composting- to convert animal mortality back into stable soil nutrients;
- 3) Concentrated animal composting - composting of mortality at DEQ permitted composting facilities;
- 4) Incineration - using a DEQ permitted incinerator to sanitarly dispose of mortality;
- 5) Landfill burial - burial in a permitted sanitary landfill (please contact your local landfill first for their acceptance procedures);
- 6) On-site burial - burial on the site where the animal mortality waste occurs.

Full documents of the DEQ guidance are available from the DEQ website:

[http://www.deq.virginia.gov/Portals/0/DEQ/Water/VirginiaPollutionAbatement/AGMortalityGuidance/2009-02 On Farm Animal Composting.pdf](http://www.deq.virginia.gov/Portals/0/DEQ/Water/VirginiaPollutionAbatement/AGMortalityGuidance/2009-02%20On%20Farm%20Animal%20Composting.pdf)

[http://www.deq.virginia.gov/Portals/0/DEQ/Water/VirginiaPollutionAbatement/AGMortalityGuidance/2009-03 On Farm Animal Burial.pdf](http://www.deq.virginia.gov/Portals/0/DEQ/Water/VirginiaPollutionAbatement/AGMortalityGuidance/2009-03%20On%20Farm%20Animal%20Burial.pdf)

### **Rendering**

Many rendering facilities have notified their customers that they will cease acceptance of most cattle because of the requirement to remove brains and spinal cords from cattle 30 months of age and older. While this FDA rule (73 FR 22719, Substances Prohibited from Use in Animal Food or Feed) applies only to cattle, local disposal options are limited for other livestock species such as sheep, swine, or horses. Rendering is the preferred option for livestock disposal; however, the availability of rendering as a means for disposal of routine livestock mortalities has been greatly reduced and other options may not be economical or locally available. At the writing of this document rendering was not available to cattle in Virginia. To find a rendering facility in your area, contact the National Renderers Association:

<http://nationalrenderers.org/about/directory>. Prices vary based on the type of animal mortality and location of mortality for pick-up or delivery.

### **On-Site Composting**

Composting is a controlled biological decomposition process that converts organic matter to a stable, humus-like product. The microorganisms that break down organic matter are naturally occurring (no special microbes need to be added to the pile). The combination of microbical activity and heat generated during the composting process destroy pathogens. Please note that many farmers think that composting involves placing the mortality in a hole with woodchips or other organic matter. This is not the case. As shown in Figure 1, composting occurs above ground.



Figure 1: Composting Pile Construction  
*Drawings by Bill Davis, Courtesy of  
Cornell Waste Management Institute*



*Photo courtesy of Cornell Waste  
Management Institute*

A more thorough explanation of how to compost can be found at the references listed below.

Livestock	<a href="http://compost.css.cornell.edu/naturalrenderingFS.pdf">http://compost.css.cornell.edu/naturalrenderingFS.pdf</a> <a href="http://cru.cahe.wsu.edu/CEPublications/eb2031e/eb2031e.pdf">http://cru.cahe.wsu.edu/CEPublications/eb2031e/eb2031e.pdf</a> <a href="http://offices.ext.vt.edu/shenandoah/programs/anr/AgricultureandNaturalResources/Composting_on_farm.pdf">http://offices.ext.vt.edu/shenandoah/programs/anr/AgricultureandNaturalResources/Composting_on_farm.pdf</a>
Poultry	<a href="http://www.ext.vt.edu/pubs/poultry/442-037/442-037.html">http://www.ext.vt.edu/pubs/poultry/442-037/442-037.html</a>

Animal mortality composting on the site of origin is considered exempt under 9 VAC 20-80-150.F of the Virginia Solid Waste Management Regulations (VSWMR). The composting should be done in a manner that does not constitute a public nuisance, health hazard or open dump. The following is the DEQ guidance recommended for composting large animal mortality.

- Animal carcass composting shall only be on the property which is used for the raising or husbandry of animals.
- **Composting of carcasses should be initiated within 48 hours of death** and prior to creation of an open dump, hazard, or nuisance situation.
- On-site composting will typically employ windrow or aerated static pile methods.
- Compost piles shall be constructed, maintained and sheltered such that the compost materials cannot be dispersed by wind and rain, and combustion and fire are prevented.
- A composting facility will be required to obtain a storm water discharge permit if they are deemed a significant source under the provisions of 9VAC25-31-120 A 1 e.
- No more than a total of 1/3 acre of compostable materials are stored on-site.
- The compost pile does not exceed 12 feet in height above base grade.
- Composting windrows or piles should be constructed to meet the following criteria:
  - Base layer of sufficient porosity for air circulation and depth (12" minimum) to absorb free liquids;
  - Cap layer of sufficient thickness (18" minimum) to provide insulation for the process and prevent odors and scavenging animals;
  - Designed with a shape and depth to shed precipitation; and
  - Situated such that runoff from the compost site does not flow directly into any surface water body.

- Composting piles, windrows or burial pits *shall not* be within (Figure 2)\*:
  - 50 feet of the property boundary;
  - 100 feet of any surface waters (streams, creeks, ponds, lakes, rivers, wetlands, etc.);
  - 200 feet from any well or spring currently used as a drinking water source;
  - 50 feet from caves and sinkholes;
  - a 25-year floodplain as defined by FEMA and/or local planning officials;
  - areas where bedrock occurs at a depth less than five (5) feet (*burial only*);
  - two (2) feet of the seasonal high groundwater table unless on an impervious surface such as concrete or asphalt;
  - 50 feet of rock outcrops;
  - 50 feet of a intermittently flowing drainage swales (*composting only*);
  - 200 feet from any off-property residence, health care facility, school, recreational park area, day care or similar public institution; and
  - 25 feet from all other buildings and structures.

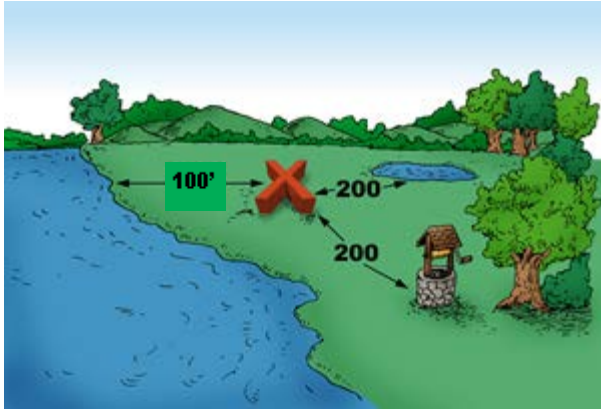


Figure 2: Composting and Burial Siting  
 Drawings by Bill Davis, Courtesy of  
 Cornell Waste Management Institute

The following materials shall not be used in composting:

- Hazardous waste;
- Treated or painted wood;
- Municipal wastewater treatment sludge, biosolids or septage;
- Agricultural waste containing herbicide or pesticide residues; or
- Any other material prohibited by the Virginia Solid Waste Management Regulations and the Virginia Vegetative Waste Management Regulations.

Pathogen destruction can be confirmed by documenting that **the interior of the compost pile (designed in the manner described above) achieves a temperature of 131 degrees Fahrenheit for three (3) consecutive days**. Compost shall be adequately cured to destroy all soft animal tissues to eliminate odors, destroy pathogens, and protect human health and environment.

Composting large animal mortality is generally considered to be complete when both pathogen destruction and adequate curing has been achieved. This generally takes **70-100 days**. However many large bones still remain.

The resulting compost needs to be beneficially reused. Options include:

- Deep stacking the compost for an additional year to allow the bones to decompose (the bones need to be on the interior of the pile to decompose).
- Re-use in composting of additional mortality. This will also facilitate the decomposition of bones.
- Screen or grind the compost to remove the bones.
- Land apply to farmland at or below prescribed agronomic loading rates. It is recommended that the compost be incorporated into the ground if the bones are not removed or if the bones have not fully been destroyed by composting. Also the compost should be sampled and analyzed to determine the nutrient value to ensure it is applied at appropriate agronomic rates.

Please note compost sold for use by the public may also be subject to VDACS Fertilizer regulations.



### ***Concentrated Animal Composting***

Some facilities are available that are permitted to handle and compost animal mortality from multiple farms. This would be a similar option to rendering where the farm is paying for the service and convenience, rather than managing the mortality themselves. This may be a good option for many farmers, but availability in your local area may be limited. For a list of concentrated animal composting facilities, contact your local Extension Office or Regional DEQ Office.

### ***Incineration***

Cost and permitting requirements make incineration expensive and unavailable in most areas, including Virginia. However, it may become more commercially available in the future. For a list of animal mortality incineration facilities, contact your Regional DEQ Office.

### ***Landfill Burial***

Some county landfills accept animal mortality from farms in their locality. Landfills will either bury or compost the animal mortality. Availability, price and drop-off times will vary by county, so contact your local landfill or Extension Office for more information.



*Composting Mortality at the Shenandoah County Landfill*

### ***On-Site Burial***

Farmers/livestock owners, who are not able to reuse, compost, or landfill their mortality per the hierarchy shown above may choose to bury their routine animal mortality. Animal mortality burial on the site of origin will be considered exempt from regulation under VSWMR so long as these wastes are handled in a manner that does not constitute a public nuisance, health hazard or open dump. The following is the guidance from DEQ for proper burial:

- Burial shall only occur on the property which is used for the raising or husbandry of livestock.
- The **carcass shall be buried within 48 hours of death** and prior to creation of an open dump, hazard, or nuisance situation.
- Each carcass shall be buried in a separate pit (i.e., one carcass per burial pit).
- There **must be at least two acres that are able to meet the siting criteria for burial** as noted below.
- The carcass shall be buried deep enough to **cover the top of the carcass with at least two (2) feet of compacted soil** to keep other animals from unearthing the carcass.
- Carcasses **shall not be buried deeper than six feet below grade**.
- **On-site burial is limited to 2,000 lbs. of dead animals on any given acre per year.**
- See bulleted list on Page 3 for Burial Siting Requirements\*.