

# On-Farm Disposal of Animal Mortalities

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Animal mortalities are an expected part of animal production. Depending on the scale of the animal enterprise, animal mortalities can overwhelm the producer with a large number and mass of dead animals. This publication provides guidance to the producer for handling animal mortalities in accordance with Kentucky law.

The rates of mortalities are somewhat dependent on management (Tables 1 and 2). For instance, mature swine, beef, and dairy animals are expected to die at a rate of up to 2 percent, which is an annual rate based on the average number on the farm, with above-average management. Poor management can produce mature animal losses greater than 5 percent. The high-

est rates of mortalities are with younger animals (birth to weaning), with losses of 10 to 12 percent, which is an average rate based on the number of animals in the group. In addition to mortalities, afterbirth from breeding animals and offal from butchered animals are materials that need to be disposed of properly.

Disposing of dead animals, slaughterhouse waste, and afterbirth can be difficult. Placing a dead animal or animal parts in a sinkhole, stream, or wooded area or leaving it to decompose are not acceptable methods of disposal. This action would be considered creating an open dump, which is against the law (KRS 224.40-100). Acceptable methods for disposing of animal

mortalities in Kentucky (KRS 257.160) are incineration, burial, removal by a licensed rendering company, disposal in an approved landfill, and composting. Whichever acceptable method you choose, it must be accomplished within 48 hours of the animal's death unless the animal is stored in a cooler.

## Incineration

In the past, on-farm incineration of mortalities has been accomplished using open burning and small on-site facilities. In 1996, Kentucky revised a law (KRS 257.160) allowing incineration of animal mortalities using a chamber (incineration being the burning of any matter using a burn chamber with a stack or chimney approved by the Kentucky Department of Air Quality.

Incineration may not be a viable option for animal producers, especially those close to or upwind of residential areas. Since 1996, regulations regarding air quality have become more stringent (401 KAR 63:005, 1998). Therefore, the possibility of obtaining a permit to incinerate mortalities using a fixed facility would be very doubtful, require air quality monitoring, and take time to obtain.

Burning farm mortalities without the use of a burn chamber, or without a chimney or stack with pollution-control devices (this is known as open burning), is not recommended. Open burning creates more air pollution than fixed facilities and may cause alarm in urban areas nearby. Air curtain burning is better for air quality than open burning but not as environmentally friendly as incineration. Air curtain burning involves the digging of a pit or

**Table 1.** Poultry mortality rates.<sup>1</sup>

| Mortality Rate for Poultry | Loss Rate (%) |
|----------------------------|---------------|
| Broiler (mature)           | 4.5 - 5       |
| Broiler, breeding hen      | 10 - 12       |
| Layer                      | 14            |

<sup>1</sup> Adapted from the Natural Resources Conservation Service, Ohio.

**Table 2.** Livestock mortality rates.<sup>1</sup>

| Mortality Rate for Swine           | Management Level     |         |      |
|------------------------------------|----------------------|---------|------|
|                                    | Excellent            | Good    | Poor |
| <b>Growth Stage</b>                | <b>Loss Rate (%)</b> |         |      |
| Birth to Weaning                   | <10                  | 10 - 12 | >12  |
| Nursery                            | <2                   | 2 - 4   | >4   |
| Growing-Finishing                  | <2                   | 2 - 4   | >4   |
| Breeding Herd (annual loss)        | <2                   | 2 - 5   | >5   |
| Mortality Rate for Cattle          | Management Level     |         |      |
|                                    | Excellent            | Good    | Poor |
| <b>Growth Stage</b>                | <b>Loss Rate (%)</b> |         |      |
| Birth                              | <8                   | 8 - 10  | >10  |
| Weanling                           | <2                   | 2 - 3   | >3   |
| Yearling                           | <1                   | 1       | >1   |
| Mature (annual loss)               | <0.5                 | 0.5 - 1 | >1   |
| Mortality Rate for Sheep and Goats | Management Level     |         |      |
|                                    | Excellent            | Good    | Poor |
| <b>Growth Stage</b>                | <b>Loss Rate (%)</b> |         |      |
| Birth                              | <8                   | 8 - 10  | >10  |
| Lambs                              | <4                   | 4 - 6   | >6   |
| Mature (annual loss)               | <2                   | 3 - 5   | >8   |

<sup>1</sup> Adapted from the Natural Resources Conservation Service, Ohio.



**Figure 1.** An example of an incinerator with an afterburner.



**Figure 2.** An afterburner used for a more efficient burn of exhaust gases.



**Figure 3.** A separate area used for storing fuel (diesel) for the incinerator.

purchase of steel pits; either option has an open top. A high velocity curtain of air is directed and blown above the pit to trap smoke and small particles in the pit. Trapped particles are recirculated in the fire for a cleaner burn before exiting the pit to the atmosphere. These systems will need the use of a large motor and fan to create the air curtain and may still create concern among neighboring urban areas.

In the event of a pandemic (such as avian flu) that would create large numbers of carcasses to be destroyed, an emergency short-term protocol would be established. Under the protocol, and in accordance with 401 KAR 63:005, either open or air curtain burning is permissible when used for agricultural management practices. Incineration is another option, but construction of a large-scale incinerator on short notice may be a costly and uneconomical option.

## Burial

Burial of animal carcasses is allowed, but it can be expensive. According to Kentucky law (KRS 257.160), a carcass should be buried 4 feet deep with its body cavity vented (opened), covered with at least 2 inches of quicklime, and back-filled with at least 3 feet of soil. The burial site should be stable and at least 100 feet from a stream, sinkhole, well, spring, public highway, or residence. The burial site should not be in a floodplain or in an area with a high water table.

Kentucky law requires that a buried animal should be covered with at least 2 inches of quicklime. The purpose of applying quicklime is to discourage scavenging by predators, prevent odors, inhibit earthworms from bringing material to the soil surface, and destroy harmful bacteria. Quicklime raises the pH, making the local environment harsh for organisms to survive. When exposed to moisture, quicklime goes through a chemical process that generates heat, which also destroys microorganisms. As quicklime may destroy the harmful bacteria and pathogens that potentially lead to death, it also creates an inhospitable environment for beneficial bacteria to break down the carcass, thus slowing decomposition.

Location is important when you consider burying an animal carcass. Although deep burial may place the carcass out of sight, many factors will affect the decomposition rate of the animal. These factors include soil temperature, rainfall, soil texture, soil pH, and moisture. Keep in mind that a carcass may still be present many years after burial. In addition, the location of water resources and consideration of soil properties (depth to bedrock, permeability, slope, etc.) are important in preventing contamination of water resources. Research has shown that mature cattle will release approximately 160 liters of liquid in the first two months of decomposition. This liquid, or leachate, can move into water resources, so be sure to select a burial site away from streams, sinkholes, and wells.

If burial is the method you choose for disposal, remember to locate any buried utility lines prior to digging to prevent damage.

## Rendering

Collection of animal mortalities by rendering companies is available in most Kentucky counties. Pickup by rendering companies may be set up as a service through the fiscal court, conservation district, or Cooperative Extension Service, and cost-share may be provided to cover part of the fee. In some counties, the producer is responsible for arranging pickup and full payment. If a rendering service is not available, the producer should choose another legal option for mortality disposal.

## Landfill

Approved landfills can be used for dead animal disposal, but they may not be convenient. Rural residents may be required to drive long distances to the nearest landfill and have to pay a tipping fee for using it. If a landfill agrees to accept a carcass, the carcass should be covered during transport and the vehicle disinfected afterward. To locate the nearest municipal solid waste landfill and contact information, go to [www.waste.ky.gov](http://www.waste.ky.gov). Click on "Branches" from the menu on the left and follow the links from "Solid Waste Branch," to "permitted operating landfills."

# Composting

Composting can provide animal producers with a convenient on-farm method for disposing of animal mortalities, while providing a valuable soil amendment when land applications are made. The compost material can also be stored and reused to decompose other mortalities. Reusing the material actually speeds up the decomposition process by providing beneficial bacteria. These bacteria also prevent the release of odors, which may attract flies, vermin, and buzzards. Kentucky law (KRS 257.160(1)(f)) allows disposal of animal carcasses by composting if the disposal is performed in an approved facility and according to the Agricultural Board's administrative regulations (302 KAR). In order to legally compost mortalities, a permit is required, which is issued by the State Veterinarian. A composting permit from the Kentucky Division of Waste Management is required if the compost product is distributed to the public. For more information about animal mortality services in your county, contact your local Cooperative Extension Service, conservation district, or other county officials. Additional information can be found in a University of Kentucky Cooperative Extension publication titled ID-166, *On-Farm Composting of Animal Mortalities*.



**Figure 4.** Open windrow composting system.



**Figure 5.** A three-bin shed with roof and doors.

## References

- Kentucky Agriculture Water Quality Plan (October 1996; revised May 1999).
- Kentucky Department of Agriculture—National Agricultural Statistics Service. 2006. Kentucky Agricultural Statistics and Annual Report. Frankfort, KY.
- On-Farm Composting Handbook (NRAES-54). 1992. Robert Rynk, ed. Northeast Regional Agricultural Engineering Service, Ithaca, NY.
- United States Department of Agriculture Natural Resources Conservation Service, Conservation Practice Standard for Composting Facility, Code 317, in Section IV of the Kentucky Field Office Technical Guide (July 1998).
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