



A QUICK GUIDE FOR AG PRODUCERS RESPONSE TO A CATTLE DISEASE OUTBREAK

Avian influenza hit Iowa turkey and layer producers hard in 2015, just as a 2001 outbreak of foot and mouth disease decimated sheep and cattle in Great Britain. While no one wants to face the heart-breaking loss of animals, planning ahead can help cattle and dairy producers make informed decisions. A plan can help producers dispose of their losses — humanely, economically and safely — for the health of their neighbors and the environment.



Cattle producers can use this guide when they have a disease outbreak or to plan for a potential outbreak. Look for these sections: five carcass disposal options in Iowa, disposal of potentially contaminated waste, supplies, equipment, and disposal of wastewater generated when decontaminating equipment, vehicles and staff.

Generally, animal carcasses and associated waste products are not considered hazardous waste unless the U. S. Department of Agriculture (USDA) and/or Iowa Department of Agriculture and Land Stewardship (IDALS) categorizes them as hazardous. If enough hazardous material like acids, pesticides or fertilizers contaminates carcasses, the carcasses may be considered hazardous waste.

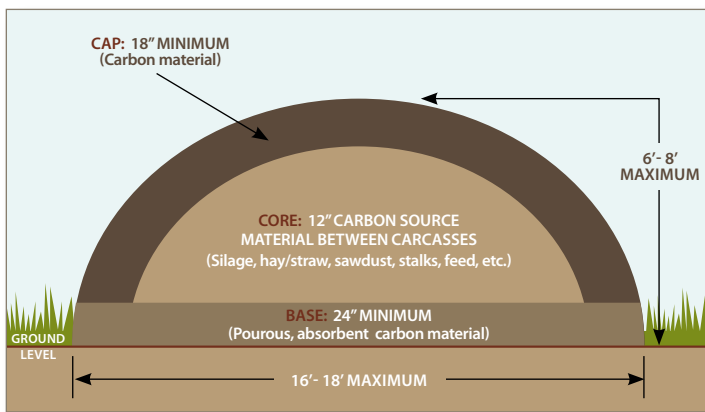
CARCASS DISPOSAL

There are five disposal options. Which one you use depends on the disease, facility location and other qualifying factors. The Iowa Department of Natural Resources (DNR) must approve disposal options prior to disposal. IDALS must approve any movement off-site and requires biosecurity measures.

1 COMPOSTING

Composting carcasses effectively eliminates viruses when done correctly. It can be cost and labor effective. Composting speeds up normal decay processes caused by naturally occurring bacteria and fungi. Follow recommendations for construction, materials and temperature monitoring to ensure quick, complete decay, avoid foul odors and prevent releasing contaminated liquids.

DIAGRAM 1: COMPOSTING REQUIREMENTS



- Height: Maximum 8 ft. (1 layer of mature carcasses)
- Cover: Minimum 18 in. thick to retain heat and absorb odor and excess precipitation.
- Windrow Width: Less than 16 to 18 ft. wide to ensure oxygen penetration.
- Width between Windrows: 2 to 3 loader lengths
- Site Location: Choose a site that is isolated from residences, wells, property lines, tile lines, surface water, flood plain and utilities (See Table 1).

2 BURIAL

Materials needed for effective composting:

- Carbon Source Material—corn silage, hay/straw, saw dust, ground corn stalks
- Cover Material—corn silage, wood chips, hay/straw, ground corn stalks
- Plan on roughly 12 cubic yards of cover/base material per 1,000 lbs. of carcasses
- Length of windrow needed: length (ft.) = 4 x number of animal units (1 unit = 1,000 lb. animal)

Factors indicating effective composting:

Moisture—For optimum performance, maintain moisture content between 40 and 60 percent. Compost should be moist but not soggy. If you can squeeze moisture from a handful of compost, mix it with drier material.

Carbon Source—Carbon is needed for high levels of microbial activity. The right materials keep compost porous allowing oxygen into the pile and permitting gases like ammonia, which inhibits microbial activity, to escape. Some materials are particularly good for absorbing excess liquid released by decaying carcasses, an important factor in preventing undesirable environmental impacts.

Heat—Heat is important for successful composting. Check temperatures frequently to ensure viruses are inactivated. Measure at two depths in the compost pile (18 in. and 36 in. from surface) at 10 to 12 locations along the length of the windrow to ensure temperatures reach 130° to 150°F for three consecutive days.

Construction—See Diagram 1 and Table 1 for separation distances.

- Base Layer: Minimum of 24 in. depth to absorb leachate.
- Compost Core: 12 in. carbon source material between carcasses

On-site burial can effectively eliminate viruses. When done correctly, it can also be environmentally safe and cost effective. If some animals cannot be buried onsite, consider burial on neighboring properties subject to the owner's approval.

Materials and Equipment— Equipment needed to dig trench and move carcasses. No additional materials needed.

Factors affecting effective burial—Burial is easiest and best under dry, warm conditions. Wet, muddy and frozen ground may require special equipment or extra care. Burial site location and conditions must meet DNR-established criteria and site conditions. Verify site location with DNR field staff. Puncture rumen or stomach of carcass to reduce gas production in trench.

Site Selection Criteria:

Choose a site that is isolated from residences, wells, property lines, tile lines, surface water, flood plain and utilities (See Table 1).

Exclude Utilities—First contact IOWA ONE CALL at 800-292-8989 to locate any buried utilities on proposed site. Premises owner must also ensure field drainage tile is located at least 200 feet from excavation.

Protect Wells and Well Source Water—Ensure private wells are more than 200 feet and public wells are more than 2,500 feet from the excavation. Check and confirm burial site is not within a source water protection zone for wells regulated by the DNR. Find source water zones at:

<https://programs.iowadnr.gov/sourcewater/maps/index.html>.

Use of Geographic Information System Maps—Use DNR's Burial Zone Siting Atlas at <https://programs.iowadnr.gov/maps/af0/burial.html> to locate potential burial sites. The maps assign risks to groundwater contamination based on the presence of alluvial soils and fractured bedrock. They also map known private and public wells. Areas shown in

TABLE 1. SEPARATION DISTANCES REQUIRED FROM OBJECTS FOR COMPOSTING AND BURIALS

Separation Distance Required (in Feet)		Object
Compost Windrow	Burial Sites	
100	200	Private well
200	2,500	Public well
50	50	Adjacent property line
500	500	Existing neighboring residence
100	100	Any surface water body
200	200	Tile line
Outside	Outside	Floodplain, wetland or shoreline area
Exclude	Exclude	Call Iowa One Call to exclude buried utilities

green and yellow might be usable, but DNR field staff must visit the site and approve its use before burying:

- Acceptable zone shaded in green—no known restrictions for burial.
- Cautionary zone shaded in yellow—only limited burial recommended.
- Exclusion zone shaded in red—no burial recommended.

Trench Construction

Minimum trench design and length is based on the size and number of animals to bury using one animal unit (AU)—one 1,000-lb. cattle carcass (2 ft. deep by 3 ft. wide and 7 ft. long or 42 cubic feet) to estimate volume. Or, $L = [V/(W \times D)] \times \text{no. of AUs}$.

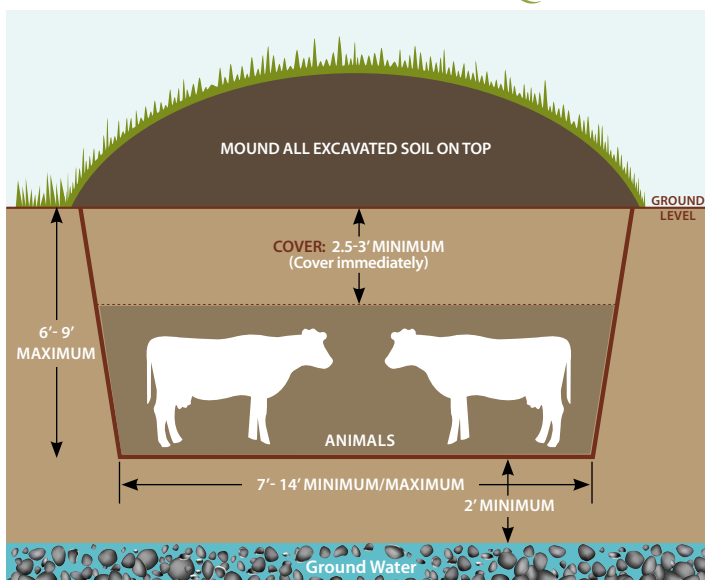
Use Table 2 to calculate trench length and depth. Choose number of animal layers from Column A and width from Col. B, then enter the number of animal units you're burying in Col. C. Multiply animal units by the multiplication factor in Col. E, solving for trench length. Determine trench depth from Col. G. See example in Table 2 to bury 250 steers weighing

TABLE 2: MULTIPLICATION FACTORS TO CALCULATE TRENCH LENGTH

A. Choose No. of Layers *	B. Choose Trench Width	C. Enter Animal Units	D. Col. C X Col. E	E. Factor	F. Trench Length (ft.)	G. Trench Depth * (ft.)
1	7 ft.		X	3.0		4.5 - 5
2	7 ft.		X	1.5		6.5 - 7
3	7 ft.		X	1.0		8.5 - 9
1	14 ft.		X	1.5		4.5 - 5
2	14 ft.		X	0.75		6.5 - 7
3	14 ft.		X	0.5		8.5 - 9
Example: 2 layers	7 ft.	250	X	1.5	375 ft.	6.5 - 7 ft.

*Allow 2-ft. depth/layer, plus 2.5-3 ft. = maximum depth of 6 - 9 ft.

DIAGRAM 2: TRENCH DESIGN REQUIREMENTS



1,000 lbs. each (1 AU). Dig trench 375 ft. long and 6.5 to 7 ft. deep.

Trench Width—Between 7 and 14 feet.

Depth—Trench should be between 6 and 9 feet deep. Keep sides as vertical as possible. If stability is a problem, slope sides to prevent cave-in and ensure equipment can safely place carcasses while maintaining minimum trench width. Distribute carcasses evenly on the bottom of the trench.

Groundwater Separation—Maintain at least 2 feet between the trench bottom and groundwater. DNR staff must verify on-site groundwater separation before trenching begins.

Surface Water Control—Construct berms to divert surface water around trenches if surface water runoff would flow into trenches.

Trench Length and Setback Distances—Although trench length and setbacks will vary with site factors, trenches must meet the following requirements:

- Follow contour lines as closely as possible
- Trench must be placed at least 50 (horizontal) feet from another trench
- Must not include any sand seams or pockets. Stop digging if the trench intersects a sand seam or pocket. Then backfill the last 10 feet of trench with non-sandy soil. Compact backfill area as much as possible. Dig a test pit every 10 feet beyond sandy area. Continue trenching after test pits show soil is free of sand.
- Meet all separation distances listed in Table 1

Cover

- Cover carcasses with 2.5 to 3 feet of cover below ground level

- Mound all excavated soil over the trench to avoid ponding water and allow for settling
- Avoid compacting the carcass cover and mounded soil above the trench.
- Seed the excavated area with shallow rooted cover crops such as oats, ryes and clovers.

3 INCINERATION/THERMAL TREATMENT

While carcasses can be incinerated, sizes and types of equipment vary greatly as does their efficiency and setup time. It pays to consider capacity, fuel use and operating costs of available units. Consult with DNR staff to obtain any required waivers or variances before starting operation. Specific separation distances from residences, property lines and other structures may be required for incineration. Check with DNR staff for equipment-specific setbacks.

4 LANDFILL

While carcasses can be sent to a landfill, the landfill must approve their acceptance. Also, disposal must meet landfill disposal criteria established by DNR, adhere to strict biosecurity measures at the farm and landfill, and be approved for movement off-site by IDALS.

5 RENDERING

While sending carcasses to a rendering plant is an approved method, make sure the facility is willing to accept the carcasses. Before choosing this option, obtain approval from DNR and IDALS for final disposal of the rendered product. Follow strict biosecurity measures at the farm and rendering facility. Finally, IDALS must approve moving carcasses off-site.

NON-CARCASS SOLID WASTE

Whenever possible, disinfect and handle non-carcass solid waste as non-infected waste. Discuss disposal options with the veterinarian in charge to determine what material is infected, if the virus can be eliminated, or if materials can be moved off site. If disinfection is not economical or efficient, there are other options. IDALS must approve removing materials from a site and biosecurity measures.

Contaminated manure, feed, milk and similar organic material may have a beneficial use. Consider using contaminated organic material, including manure and feed, in the core of a compost windrow.

Wood and similar solid waste can be burned on site following the DNR disaster debris disposal

guidance for burning trees and brush. If DNR requirements cannot be met, the material can be burned at an approved off-site area, taken to a landfill, or incinerated on or off site with DNR approved incineration equipment. Obtain approvals for off-site disposal according to the method chosen.

WASTEWATER

It's important to follow guidelines to safely dispose of wastewater generated when responding to a disease outbreak. Wastewater includes water generated from decontamination and biosecurity, cleaning and disinfection, normal operations or any other wastewater generated at an infected premise. Whenever possible, dispose of wastewater at the infected premise. Take biosecurity measures and get approval from IDALS for off-site disposal.

Disposal options:

If the site has on-site treatment, obtain DNR and IDALS approval and treat wastewater at the site.

Some thermal units need additional water to process carcasses. Wastewater generated on site can be treated as part of the thermal unit's operating process. Producers can haul wastewater to a thermal unit if they take biosecurity measures and IDALS approves.

Some city or other permitted wastewater treatment facilities will accept wastewater from response operations, including activated sludge treatment plants that use ultra-violet (preferred) or chlorine disinfection. During winter when disinfection units don't normally operate, the facility should activate disinfection units. Alternative treatment such as fixed film may be considered if approved by the DNR field office. Once DNR approves, the treatment facility must agree to accept the wastewater, the producer must adhere to strict biosecurity measures at the farm and the treatment facility, and IDALS must approve moving wastewater off-site.

DNR CONTACTS

Field Office	Location	Business Hours Phone
1 – NE Iowa	Manchester	563-927-2640
2 – NC Iowa	Mason City	641-424-4073
3 – NW Iowa	Spencer	712-262-4177
4 – SW Iowa	Atlantic	712-243-1934
5 – SC Iowa	Des Moines	515-725-0268
6 – SE Iowa	Washington	319-653-2135
Emergency Response After Hours Phone (Duty Officer)		515-725-8694