IOWA DEPARTMENT OF NATURAL RESOURCES

A Quick Guide for Ag Producers
Response to a Poultry Disease Outbreak

Avian influenza hit Iowa turkey and layer producers hard in 2015. Producers faced agonizing choices as they lost their flocks. They had to make quick decisions on how to dispose of their losses — humanely, economically and safely — for the health of their neighbors and the environment, now and in the future.

Composting at turkey facility.

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

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. The Iowa Department of Agriculture and Land Stewardship (IDALS) must approve any movement off-site and required biosecurity measures.

1 Composting

Composting carcasses effectively inactivates 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 of highly contaminated liquids.

Materials needed for effective composting:

- Carbon Source Material – corn silage, poultry litter, 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
- To estimate the length of windrow needed, allow one foot of windrow for:
  - 82 ducks
  - 50 chickens
  - 14 turkeys

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.

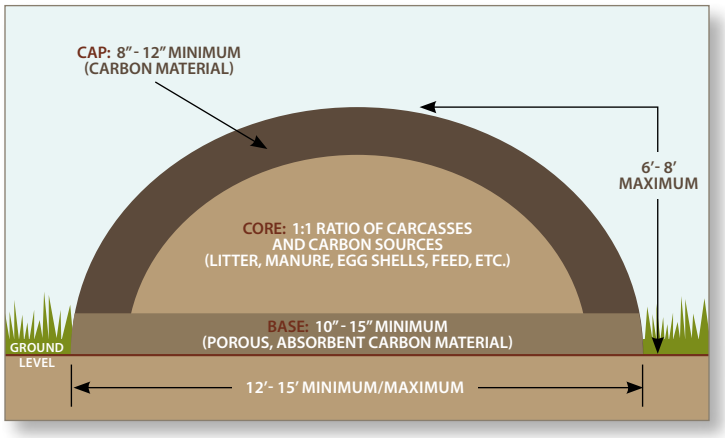
Heat — Heat is important for successful composting. Check temperatures frequently to ensure viruses are inactivated. Measure at two depths in the compost pile (18″ and 36″ from surface) at 10 to 12 locations along the length of the windrow to insure temperatures reach 130 to 150ºF for 3 consecutive days.

Construction:

See Diagram 1 and Table 1 for separation distances.

- Base Layer: Uncompacted and minimum of 15 in deep to absorb leachate.
- Compost Core: 1:1 mix of poultry and carbon source material
- Height: Maximum 8 ft.
- Cover: Minimum 12 in to retain heat and absorb odor and excess precipitation.
- Windrow Width: 15-ft. maximum base; 14-ft. maximum windrow to ensure oxygen penetration.
- Width between Windrows: Two loader widths

Diagram 1: Composting Requirements



2 Burial

On-site burial can effectively inactivate 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.

Site Selection Criteria:

Materials — 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.

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: programs.iowadnr.gov/sourcewater/maps/index.html.

Use of Geographic Information System Maps — Use DNR's Burial Zone Siting Atlas at programs.iowadnr.gov/maps/afo/burial.html to locate potential burial sites. The maps assign risks to groundwater contamination based on alluvial soils and karst topography. They also map known private and public wells. The first two zones might be usable,

Table 1. Separation Distance Required Between Object and Windrow or Trench

Separation Distance Required (in Feet)		Object
Windrow	Burial Trench	
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
Outside	Outside	Floodplain boundaries, wetland or shoreline area

but DNR field staff must 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.

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

Trench Construction

Base size of trench on the size and number of animals to bury. Using Table 2, multiply number of animals by volume per animal to determine volume needed for disposal. Divide by desired width of trench (7 to 12 feet). Divide remaining number by depth (between 5 and 9 feet) to determine the length of trench needed.

Trench Width — Between 7 and 12 feet.

Depth — Trench should be between 5 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. Distribute carcasses evenly on the bottom of the trench.

Diagram 2: Trench Design Requirements

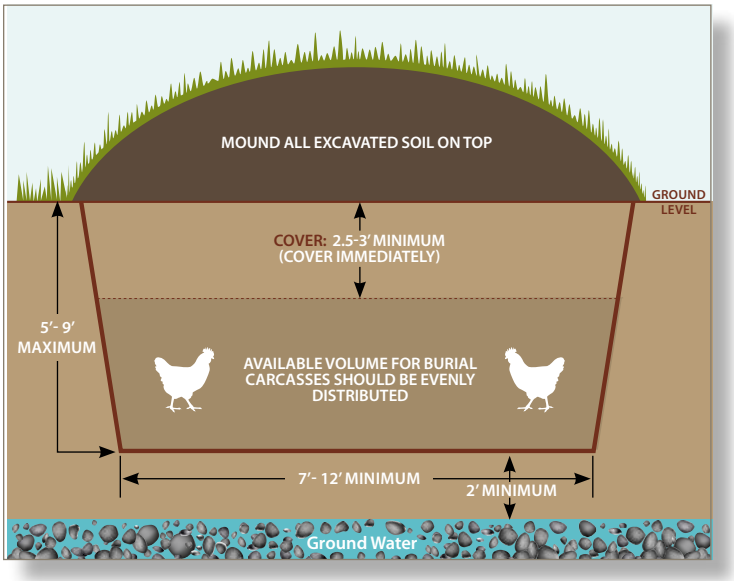


Table 2: Volume Estimator

Type of Animals	Number of Animals	Multiply	Volume in Cubic Feet/ Animal	Trench Volume Needed – width x depth x length (Cubic Feet)
2-lb. Duck		X	0.01	
3-lb. Chicken		X	0.02	
7-lb. Turkey		X	0.6	

Groundwater Separation— Maintain at least 2 feet between the trench bottom and groundwater. Groundwater depth must be verified on site before trenching begins.

Cover —

- Cover carcasses with 2.5 to 3 feet of cover below ground level
- Mound all excavated soil over the trench
- Avoid compacting the cover soil
- 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. It pays to consider capacity, fuel use and operating costs of available units. Consult with DNR staff to obtain any required permits, waivers or variances before starting operation.

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 the Iowa Department of Agriculture and Land Stewardship (IDALS).

5 Rendering

While sending carcasses to a rendering plant is approved, the facility must be willing to accept the carcasses. Also strict biosecurity measures must be met at the farm and rendering facility and IDALS must approve moving carcasses off-site. Obtain final approval from the DNR and IDALS for the final disposal of the rendered product before choosing this option.

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 inactivated, or if materials can be moved off site. If disinfection is not economical or efficient, there are other options.

Contaminated litter/manure, feed, egg products and similar miscellaneous material may have a beneficial use. Egg products may be pasteurized and sold. Consider composting organic material including litter/manure and feed. In some circumstances mix with carcasses and bury these materials in the trench or add them to compost windrow.

Wood, cardboard, paper and similar solid waste can be burned on-site following the DNR disaster debris disposal guidance for burning of tree and brush. If DNR requirements cannot be met, the material can 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.

Treating wastewater onsite requires approval from DNR and IDALS. Obtain IDALS' approval to transport wastewater to an offsite treatment facility.

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	Business Hours Phone	After Hours Phone (Duty Officer)
1 – NE Iowa	563-927-2640	515-725-8694
2 – NC Iowa	641-424-4073	515-725-8694
3 – NW Iowa	712-262-4177	515-725-8694
4 – SW Iowa	712-243-1934	515-725-8694
5 – SC Iowa	515-725-0268	515-725-8694
6 – SE Iowa	319-653-2135	515-725-8694
Emergency Response	515-725-0386	515-725-8694