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Poultry Mortality Disposal Methods Following Catastrophic Loss

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Mortality disposal following a natural disaster or catastrophic disease event can become a major challenge for poultry producers. The magnitude of that challenge is difficult to anticipate at the onset of such events. Preparing ahead of time with the necessary materials and methods is important to lessen the stress and confusion that can accompany disaster recovery.

Disposal decisions must balance animal health goals with those of environmental protection and safeguarding public health. In the event of catastrophic disease, humane destruction of infected or exposed poultry and proper disposal is needed to stop further spread of infectious organisms. Establishing pre-emptive culling and controlled slaughter programs for suspect cases may be feasible and can assist in limiting the potential spread of disease. At times healthy birds may need to be slaughtered prematurely to create a safe buffer zone.

In Georgia, it is unlawful for any person to dispose of, or cause to be disposed of, dead poultry in any manner other than by state-approved methods. In the event of significant mortality losses, the Commissioner of Agriculture may approve the use of some alternative means of disposing of large quantities of dead birds. Regardless of the method used, state law requires disposal of dead poultry within 24 hours of death or discovery. If Avian Influenza (AI) or other such infectious disease is confirmed, 24-hr destruction orders may also be issued for exposed birds.

Disposal Options

The volume of mortality or destroyed birds that must be dealt with from a disaster can pose a daunting task. A common challenge during catastrophic disease events is to ensure that carcass disposal keeps pace with the rate of infection and exposure. It is likely that a combination of disposal methods will need to be employed to accomplish the mortality management requirements during a time of significant death loss or depopulation efforts. On-site disposal of mortality is preferred over off-site disposal practices to reduce potential spread of disease organisms and environmental impacts. Adherence to proper management is the key to the successful use of any mortality disposal method.

Following the low pathogenic AI outbreak in Virginia in 2002, the Virginia Department of Environmental Quality drafted a priority list of recommended mass mortality disposal options.

Preference was given to methods that keep birds on-site rather than transport them for disposal elsewhere, which can increase exposure risks to other flocks. Other states, including Georgia, have similar prioritized methods of mortality disposal in the event of a natural disaster or catastrophic disease outbreak.

1. **On-site Composting.** One of the most biosecure and environmentally sound options available for mortality disposal. Siting of the compost windrow becomes a priority to prevent nutrient leaching and nuisance issues. Composting does require attentive management and a large source of carbon substrate (e.g., litter, sawdust, straw) to use as co-composting material. The principles of composting are the same with massive losses as with normal daily mortality. Typically a 3:1 carbon to mortality volume ratio is needed for effective composting to occur. Bringing carbon materials to the farm poses some biosecurity risk from vehicles entering and exiting the facilities. Following prescribed compost management practices and recipe recommendations will provide for effective catastrophic mortality composting.
 - A. *In-House Composting.* Where possible, carcasses and litter should be left within the house for at least the initial compost cycle for inactivation of pathogens within the material before it is removed from the facilities. Maintaining the compost process under roof eliminates potential air and water quality issues. Once the compost has been through a primary heating cycle, it can be removed from the house for additional heat cycles and then land application.
 - B. *Out-of-house Composting.* For high-rise layer houses or other structures that will not accommodate composting space or equipment requirements, mortality can be placed in sealed totes or trailers and moved to an on-site location for composting. While this process exposes the area to the active pathogen, the material remains on the premises and under quarantine conditions. Careful control of traffic on and off the farm must be heightened under these disposal conditions.
2. **Other On-site Methods if Available.** Alkaline hydrolysis and anaerobic digestion are alternative disposal methods that can be utilized given the availability of the needed equipment and resources. These processes, while effective, may not be available when needed and can be cost prohibitive as a primary means of carcass disposal.
3. **Off-site Disposal at Permitted Landfill.** This method, while pragmatic, has some inherent risks associated with it. A pre-approved list of certified, accepting sites is needed. Not all landfills can or will accept animal mortality. Transport containers or trailers must be double lined with plastic sheeting and disinfected to and from the landfill site and still pose a potential biosecurity risk when taking infected carcasses from houses onto public roads. Tipping fees combined with hauling costs make the use of landfills one of the more costly forms of mortality disposal.
4. **Off-site Rendering, Incineration, or Composting.** There are inherent risks associated with off-site processing or disposal, namely the potential spread of pathogens during the pickup and transport of mortality from one site to another. Adherence to strict sanitation and disinfection practices for transport vehicles and personnel can alleviate most biosecurity concerns.

- A. *Rendering* is perhaps the most environmentally safe method of mortality management as it removes the mortality from the farm and relieves the grower of environmental concerns that exist with other methods of mortality management. Through rendering, mortality is recycled into a valuable, biologically safe protein by-product. Location, availability and volume capacity are all conditions that will determine the opportunity to utilize a rendering facility during a catastrophic loss.
 - B. *Incineration*, if utilized as a disposal method, air-curtain technology will likely be chosen. This incinerator system is designed to reduce emissions compared to traditional incineration methods by creating a high velocity air curtain that stops the particles from escaping into the atmosphere, remaining under the air curtain for re-burn. Temperatures of 1,800 to 2,200 degrees F are typically achieved with this technology which has a throughput typically of 5 to 6 tons of mortality per hour. A supply of wood or burnable waste product is needed to fuel the fire. Mobile units can be transported to an appropriate site for operation.
5. **On-site Burial under Emergency Permit.** The traditional method of disposal of dead poultry is by burial and this method is likely to be used extensively in the case of highly pathogenic disease outbreak. Regulations require that an appropriate site be approved, with the type of soil that allows for proper drainage and mandatory separation from the local water table. Problems associated with burial include; the potential for spillage and contamination when moving the birds outside the house; restrictions on approved sites due to high water table or soil type; long-term fallowing of the burial site; and public perception issues with regard to local ground water contamination. As an alternative to in-ground burial, carcasses could be mounded above ground and covered with dirt. After the crisis is over, the material could then be moved to a more permanent site.

Conclusions

In the event of mass mortality, a variety of techniques can be used for carcass disposal. Preference is given to methods that keep birds on-site rather than transport them for processing elsewhere, increasing exposure risks to other flocks. Composting is the preferred disposal method, though burial will likely predominate because it is relatively cheap and quickly accomplished. Incineration with an air curtain will have a role, but may be limited by the availability of equipment and combustion resources, approval by regulatory agencies, and public acceptance.

Whether by disease, natural disaster, or an act of bioterrorism, widespread poultry mortality poses disposal challenges that, if not met quickly and effectively, can lead to major environmental contamination and public health problems. A rapid and effective disease eradication response is vital to minimizing animal losses, economic impacts, and public health hazards. Realization of a rapid response requires emergency management plans that are based on a thorough understanding of disposal alternatives.

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