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CATASTROPHIC MORTALITY MANAGEMENT

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Are you prepared to deal with a catastrophic mortality loss on your farm? Do you have disposal procedures, materials, knowledge and approvals in hand that allows you to respond to this kind of event in a swift, economical, environmentally and socially acceptable matter? Although the poultry industry makes every effort to circumvent catastrophic losses, there are numerous situations that pose risk, many of which are unavoidable. A catastrophic loss can be a few thousand birds in a house or farm, or can represent millions of birds in an entire region of the country that requires mass disposal. There have several recent examples in which there was uncertainty and lack of knowledge on methods of mass disposal, lack of preparation to deal with a catastrophic event and perhaps more important, not having procedures pre-approved by local and state regulatory authorities. The consequence of these situations has been conflict, delays in responding to the emergency at the most critical time period and added overall cost to deal with the crisis.

Situations that lead to catastrophic mortality events are numerous. With a shift toward windowless housing and greater dependency on electronics and power ventilation, electrical outages less than half-hour duration can results in partial or whole houses "heat" losses. These losses can be limited to one or more houses on a farm or can be widespread in a region such as recently seen with Hurricane Katrina. Although back-up generators are required for most farms to deal with power outages, past experience have found they are not fail-proof in all situations. To farther complicate mortality disposal issues are natural disasters which cause additional structural damage to the houses. Examples of natural disasters causing structure damages include wind from hurricanes and tornados, and collapsed roofs from heavy snow or ice loads. As seen with Hurricane Floyd in North Carolina, flooding can cause yet another significant disposal challenge. When the decision is made to depopulate a farm for disease control purposes selection of the disposal method should focus on minimizing disease spread. Recent Avian Influenza events suggest every effort should be made to inactive the virus prior to carcass (and litter) removal from the house. Finally, flocks identified with and depopulated due to chemical residues may require disposal options that avoid environmental contamination.

Every catastrophic loss on each farm needs to be assessed to determine the appropriate disposal option(s). The following are some of the questions that need to be asked when analyzing potential options. What caused the catastrophic event? How many and what size birds are involved? Is it a partial or whole/farm loss and are these losses widespread in the region? What resources and disposal options are available on the farm, from the poultry company or agency(s) overseeing this matter? What is the state of carcass decomposition? What local, state and/or federal regulations apply to this situation? How will the public "perceive" the disposal option being recommended?

The following are some brief highlights of disposal options for catastrophic mortality events.

Burial. For many catastrophic mortality events on-farm burial has been the predominant disposal option. This practice is one of the simplest and most cost-effective ways to deal with many types of mass mortality losses. Although many states have previously relaxed environmental standards for burial when dealing with an emergency, this situation is changing due to increasing water quality and public perception concerns. Following the unearthing of intact ~15 year old avian influenza carcasses at a trench burial site in Virginia in the late 1990s, environmental standards have become so stringent in this state the requirements have essentially eliminated on-farm burial as a mass disposal option. In locations having high seasonal water tables such as Delmarva, shallow burial above the water table may be allowed but not the preferred method of disposal. Finding an elevated site that is not in close proximity to the water table can be a major challenge following a flooding catastrophe. Furthermore, burial may not be an option for some types of chemical residue depopulation situations and when the ground is frozen. When houses are damaged beyond repair due to natural disasters, separation of house debris from carcasses and litter is not possible and burial of the entire mass may be one of the few viable options.

Sanitary Landfill. The use of sanitary landfills has been used extensively for mass disposal of avian influenza flocks in the last few decades. It may also be one of the few options for disposal of some types of chemical residue contamination in poultry carcasses. Since all landfills do not accept carcasses, pre-approval is required and there can be logistical challenges when coordinating the transportation and deposition of large volumes of carcasses to these sites. Costs associated with transportation and tipping fees can be significant. During several recent avian influenza outbreaks there are indications that any disposal option that removes infectious carcasses from farms poses a potential biosecurity risk of spreading the virus to other farms.

Rendering. For some geographic areas that have plants capable of processing whole carcasses, rendering may be a viable and cost-effective option for non-disease and residue-free carcasses. The coordination of on known tonnage of non-deteriorated carcasses is a requirement and often a logistical challenge.

Incineration. Portable incineration units (i.e., Air Curtain) have been used on a limited scale in recent Avian Influenza outbreaks. Although the end product is very biosecure there are some logistical and environmental issues with this procedure. The units need to be transported to the region of the country having the catastrophic losses. Carcasses are then transported to a central and preferably remote receiving site. The incineration process is somewhat slow, loading decomposed carcass poses a problem and it will require disposal of 0.3 tons of ash per ton of carcass. Without the proper fuel source and supervision of the process, smoke and odor can create nuisance complaints. With special permitting, collapsed and severely damaged houses from a natural disaster along with the litter and birds have been burned on-site.

Composting. There has been increasing acceptance of composting as a practical, economical and environmentally sound method for disposal of many types of catastrophic mortality events. Following a major heat loss on the Delmarva Peninsula in 1995, the local universities conducted a demonstration and developed guidelines (Carr *et al*., 1996) for outside windrow composting of catastrophic mortality events. This procedure involves placing a 12 inch layer of carbon material (i.e., sawdust, wood chips, litter, etc.) on a well drained site. Starting with a 12 foot wide base, the windrow is constructed in alternate layers of carcass (not to exceed 10 inches per layer) and carbon (6 to 8 inch layer). The final windrow is capped with a carbon material to cover exposed carcasses and should not exceed 7 feet in height. Windrows constructed in this manner will accommodate ~300 pounds of mortality per linear foot. Ideally, the windrow should be turned to aerate the mixture when the temperatures decline below 115 F or in about two weeks after pile formation. In recent years when litter from the farm has been used as the carbon source, the windrows have been covered with polyethylene, tarpaulin or compost fleece. These covered piles have been allowed to “age” before turning. Although the tarpaulin and compost fleece are more expense, they are reusable and allow moisture to escape from the pile yet shed rainfall. A wet condensate layer will often form under windrows covered with polyethylene.

During the low pathogenecity H7N2 avian influenza outbreak on Delmarva in 2004, in-house composting was used successfully to contain and inactivate the virus in the carcasses and litter (Malone *et al*., 2004). The procedure used on these farms involved the formation of a single windrow 10 to 12 foot wide by 3 to 5 foot high down the center of the house. The litter and carcasses were mixed uniformly and capped with litter or sawdust to cover exposed carcasses. This procedure requires 0.8 inches of litter/carbon per pound of carcass per square foot floor space (Tablante and Malone, 2005). Crushing or shredding carcasses prior to windrowing reduces the additional carbon requirement to compost large carcasses such as roasters and turkeys (Bendfeldt *et al*., 2005). After ~2 weeks the windrows were turned in the house, capped to cover any exposed tissue, and allowed to compost for another 2 weeks prior to removal. An alternative procedure is to remove the compost after the first 2 weeks and place in a covered windrow outside the house.

An Ag-Bag composting system has been employed on a limited scale during several recent avian influenza events in the United States and Canada. This system requires specialized equipment to mix carcasses with the carbon source, load the mixture into the bags and maintain proper aeration. Due to logistical considerations it may be more appropriate to transport the carcasses to a central site for composting with this system. Since broiler breeder and caged layer farms may have limited on-farm carbon sources and these types of carcasses tend to more difficult to compost, transporting theses mortalities to a centralized and professionally operated Ag-Bag site may be appropriate.

In some situations were the houses have been flooded the carcasses have been skimmed-off the litter surface and layered in outside windrows as described previously or placed in layers inside manure sheds. On some poultry farms in North Carolina following Hurricane Floyd it was several weeks before waters receded before mass disposal could be implemented. Using track-type skid-steer loaders, dry shavings were added to the “soupy” litter/carcass mixture in order to facilitate material handling. This mixture was placed on a sawdust base in outside windrows or in the manure sheds. Alternative layers of this mixture and dry shavings were used to form 4 to 5 high by 15 to 25 foot wide windrows. Dry shavings were used to cap the windrow and to form a 3 foot high berm around the pile to capture runoff.

References

Bendfeldt, E., R. Peer, G. Flory, G. Evanylo, L. Carr and G. Malone. 2005. Can Catastrophic Turkey Mortalities be Composted In-House as a Means of Disposal? Symposium on Composting Mortalities and Slaughterhouse Residuals. Portland, MA.

Carr, L., H. Brodie, J. Martin, Jr., G. Malone, D. Palmer and N. Zimmermann. 1996. Composting Catastrophic Event Poultry Mortalities. University of Maryland Fact Sheet No. 732.

Malone, G., S. Cloud, R. Alphin, L. Carr and N. Tablante. 2004. Delmarva in-house carcass composting experiences. Proceedings 39th National Meeting on Poultry Health and Processing. Ocean City, MD. pp. 27-29.

Tablante, N. and G. Malone. 2005. Guidelines for In-House Composting of Poultry Mortalities Due to Catastrophic Disease. Compact disk available from Universities of Maryland and Delaware.