

## Options for Dead Bird Disposal<sup>1</sup>

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Disposal of dead birds on the farm continues to be a challenge from the standpoints of cost, environmental safety, biosecurity and practicality. While we, hopefully, have to deal with only a relatively small amount each day, disposal or preservation must also occur daily in order to meet the above challenges. Based on 1999 Florida agricultural statistics from the Florida Department of Agriculture, the layer industry could generate 2.14 million pounds of carcasses annually while broiler concerns might have to dispose of about 10.2 million pounds.

### Burial

Burial has been the method of choice for years because of its low cost and convenience. A deep pit with inside framing and a tight-fitting cover can be constructed, or an open trench prepared by a backhoe can be progressively filled as birds die. Some growers use a transplanting auger to dig smaller round holes for disposal. In order to control odors and flies, and discourage scavengers, a covering of at least two feet of earth must be maintained. Of course, all of these methods should be sited on high ground where the groundwater level is well below the bottom of the excavation. The disposal cost

associated with burial pits has been estimated to be 3.68 cents per pound for a broiler flock of 100,000. Disposal in a municipal or commercial landfill is also an option when the operators will permit carcass burial. This route is usually reserved for larger or emergency disposal needs because of tipping and transportation costs.

### Incineration

Incineration is probably the most biologically safe method of disposal. It creates only a small amount of benign waste that can be easily disposed of and does not attract pests. It is also a serviceable option where a high water table or soil type precludes excavation. But there are concerns about odors, particulate emissions, slow through-put and costs. Here, a 100,000 broiler flock would incur a cost of 8.92 cents/pound. There has been some revival of interest in this method because of design improvements that have lowered fuel costs by more than half.

### Composting

Composting has emerged as an environmentally safe disposal alternative. This method enables

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1. This document is Fact Sheet AN-126, one of a series of the Animal Sciences Department, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida. Original publication date May 2002. Reviewed November 2008. Visit the EDIS Web Site at <http://edis.ifas.ufl.edu>.

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on-farm conversion of dead birds into a humus-like soil amendment. Adding water to alternating layers of straw, carcasses and manure in bins placed on a roofed concrete slab starts the process. The suggested by-weight ratios of these various components are: 1 part carcass, 2 parts poultry litter, 0.1 part straw and 0.25 part water. The thermophilic bacteria then go to work using the nitrogen, carbon and fat from litter and dead birds, to digest them at temperatures of 130-150°F. Most large farms use a two-stage process, wherein, after a couple of weeks when the temperature has decreased, the material is turned into a second bin to aerate the compost. Heating and further decomposition occurs over the next week to produce a compost that can be applied to crops or pastures. Smaller farms without a loader could consider using mini-composters (4 ft x 4 ft x 4 ft boxes with removable side panels). As many units as are needed to accommodate a flock are placed in a concrete-floored shed and filled using the proportions previously mentioned. In small-scale composting, achieving the desired 50-60% moisture level in the bin is much more important than in larger two-stage operations. After the temperature has peaked above 130°F and begins to decrease, the compost can be moved to storage or applied to the soil.

While composting is effective, it requires a loader (two-stage), time and attention to detail. Also there is still a substantial volume of material to be transported away. The average composition of broiler compost has been found to be: 28% moisture, 1.9% nitrogen, 2.3%  $P_2O_5$ , and 1.6%  $K_2O$ . The cost of large-bin composting on a broiler farm has been reported at 4.88 cents/pound for a flock of 100 thousand. A similar calculation for a small-bin operation yielded 3.50 cents/pound of mortality.

## Rendering

The rendering option allows removal of carcasses from the farm and eliminates environmental pollution possibilities while recycling a troublesome waste material into a good feed ingredient. Renderers have been cooking, hydrolyzing and pressing processing plant wastes into by-product meal, feather meal and fat for years. The three major concerns related to this method of disposal are biosecurity, proper feather breakdown and a suitable on-farm storage method to reduce transportation cost.

Dr. John Brown, while at Dekalb Research, offered some recommendations in that area, starting with a farm having a written biosecurity plan that is reviewed often to emphasize its importance. The storage and pickup container should be secure against animal invasion and located at least 100 yards from houses. Carcasses should be taken to the storage site at the end of the day by an employee not returning to farm buildings that day. Brown also suggests that money spent on biosecurity should be viewed as an investment in future profitability.

A rendered carcass meal has been produced and tested in feeding trials with broilers here at the University of Florida. The full-fat processing yield was 41% and use of the material at up to 12% of the diet supported equal or improved feed efficiency. Neither meat flavor nor texture were affected by the inclusion of the meal in the diet. Feather hydrolyzation did not appear to be a problem and the meal contained 55.7% protein, 2.03% sulfur amino acids, 3.15% lysine, 3.73% calcium, 1.47% total phosphorus and 0.41% fiber.

## Preservation by Freezing

Freezing was one of the initial preservation methods tried. One broiler company developed special weather-proof units that could be handled with a forklift. The freezer unit never leaves the farm. The bird container is either hauled away or emptied at the farm in order to transport the contents to a rendering facility. The cost of using refrigeration in a 100,000-bird broiler operation has been estimated at 11.41 cents/lb.

## Preservation by Lactic Acid Fermentation

Lactic acid fermentation has also been widely tested as a preservation method for holding carcasses up to three months before rendering. Carcasses need to be ground, thoroughly mixed with the correct amount of a fermentable carbohydrate such as molasses, corn meal or dried whey, and brought to 60-70% moisture. The lactic acid bacteria present in the gut then start to convert the energy source to lactic acid. As the conversion proceeds (in the absence of oxygen), the pH is naturally lowered after five to

seven days to between 3 and 4.5 where spoilage bacteria cannot survive. This process does take some attention to detail in terms of accurate measurements of raw materials and thorough mixing. Another prerequisite is a rendering facility that will accept the product. Either the renderer or the producer must also have equipment for transporting the tanks of fermented product. In economic evaluations this method compared favorably with a per-pound cost of 4.55 cents when employed on a 100,000-broiler farm.

### Preservation by Acidification

Another way to preserve dead birds for future rendering is acidification. In this method, the carcasses are not ground but punctured with a blunt metal rod and submerged in an air-tight vat of sulfuric acid. This procedure also has the advantage of destroying disease organisms and harmful bacteria. No full-scale economic data could be located on this preservation alternative but it was estimated to be three to four cents per pound.

### Other Methods

Some other, less tested methods of disposal have been mentioned in the popular press and in personal contacts. One of these is the construction of a dead bird digester. Concrete tanks are placed in the ground, partially filled with water and bacteria added. Dead birds are chopped into the tanks where they are digested away. Field reports on this method vary widely from good results to ineffectiveness. A variation of this procedure has been tried in houses with lagoons. Dead birds were ground into the lagoon and the naturally occurring bacteria allowed to carry out the digestion. The additional organic load to the system was not reported to be a problem. Garbage-feeding operations in which food wastes are collected and cooked for livestock feeding have also been mentioned as outlets for mortality. For commercially permitted producers, alligator feeding is also a disposal alternative.

Unfortunately, there is no simple or single answer to mortality or other waste disposal challenges. Each operation must determine the method most suitable to their management ability, environmental conditions and financial parameters.

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