

# Composting: Least-Cost Method For Poultry Disposal

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MANHEIM (Lancaster Co.) —  
Every year poultry producers have to deal with a big pile of problems — about 1.2 billion pounds of dead chickens and turkeys.

What are some of the options for producers who are not only battling competition from other meat sources, but environmental and public nuisance-type regulations over how to properly dispose of dead poultry?

According to one Penn State poultry science educator, there are a host of viable solutions to the problems of poultry mortality. What's the least-cost option? Compost them, noted Dr. Paul H. Patterson, Penn State poultry science instructor.

Patterson spoke Monday to about 30 producers and agri-industry representatives at the Penn State-sponsored Poultry Health and Management Seminar at Kreider's Restaurant in Manheim.

The Penn State researcher pointed to research by several universities into the options and costs of disposing of dead poultry.

"The bottom line," said Patterson, is that simple composting methods proved to be "the least cost of all of (the options) on a hundredweight basis. That's the way to go if you're looking at total cost of disposal."

Patterson introduced several methods of disposal in addition to composting. They include burial, incineration, and rendering and reclaiming of nutrients. But "com-

posting is an existing technology that's working very well," he said. "When it's done right, it can be great. When it's not done right, it can be a real challenge, too."

Several issues are central to dealing with chicken mortality. Because the areas of disposal are close to public housing, the public will be looking ever more closely at how dealing with mortality, including composting, is handled.

Burial may be a "time-honored tradition," noted the poultry educator. While this still works, "open and shallow pits are totally unacceptable," he said.

Patterson recently returned from a fact-finding trip to the Southeast. He noted that in Arkansas, which has a high water table, pits are outlawed because of the public's concern about pathogens from poultry sources in groundwater supplies. Pits "can be an environmental and disease disaster," he said.

Incineration can be an excellent way to handle dead poultry. Disease and insect challenges are eradicated. The downside of incineration, Patterson noted, was start-up costs and cost of fuel. Also, the odors caused by burning poultry can be a challenge. And the units need to be replaced every 5-7 years. Incineration costs can run from 3-4 cents per pound of product (for the propane gas fuel).

Composting, at a cost of about \$3.50 per hundredweight, has a "lot of future in Pennsylvania and the whole poultry industry," Patterson said.

There are different recipes and ratios, but Patterson pointed to the

following: a ratio of 1 (mortalities) to 2 (used litter) to 0.1 (straw) to water (0.25). The carbon-nitrogen ratio needs to be about 23 carbon to 1 of nitrogen (a range of 15:1 to 35:1). Moisture should be 55 percent (within a range of 40-60 percent). If the compost system is too dry, bird carcasses mummify and won't break down.

Moisture and air supply (composting is an aerobic process) are critical issues, noted Patterson.

To start, producers need to have a solid base, concrete pad (preferred) or wood. The base should be followed by a double layer of manure, followed by the dead poultry, followed by manure, followed by straw. Subsequent layers would repeat the process — dead poultry, then manure, then straw.

Water should be added (misting the feathers) with each layer of birds. Water is dependent on the moisture level of the manure, the humidity in the air, and other factors. It's important, Patterson

noted, to place the water on the inner layers only — if water pools at the base, then too much was applied.

The key is to allow the bacteria and fungi present in the birds and manure to work to break down the organic material. In the aerobic process, heat is generated. The heat kills the pathogens, weed seeds, and fly larvae. Turning the product also restarts the heating and composting cycle, allows aeration, and continues the composting process.

Almost any source of carbon will work, including straw, sawdust, or wood shavings. Shavings have about a 400: or 500:1 carbon ratio.

Patterson pointed out some information about a medium-sized composting operation in Alabama that used several primary bins and a storage area. The composter required a \$3,000-\$5,000 investment, but included a concrete pad. A front-end loader or skid-steer

loader is used to deliver the product to the composter.

A small layer flock in Lancaster County uses straw and hen manure. As a carbon source, the straw works well for them, noted Patterson.

This "minicomposter" doesn't require a skid loader and doesn't handle a large amount of birds. The minicomposter uses five pallets, one on each side, with a pallet on the bottom. The pallets are hinge connected (though producers could use pins or wires). It works well.

Patterson noted some research on other methods of mortality disposal, which included rendering and reclaiming nutrients. Refrigeration units are used to store the dead birds until central pickup.

Also, he reviewed research into using acid or base concentrations to render birds. In one case, feed-grade phosphoric acid was used, though propionic and sulfuric

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