

# Composting FACTSHEET



BRITISH  
COLUMBIA

Ministry of Agriculture, Food and Fisheries

Order No. 382.500-8  
Agdex 537 / 727  
September 1996

## MANAGING POULTRY MORTALITY COMPOSTING SYSTEMS

Poultry composting can be accomplished by placing a 300 mm (12 in) layer of dry poultry litter in the bottom of a bin as shown in Figure 1. When carcasses release excess moisture, this absorptive base layer helps prevent release of highly odorous leachate.

Carcasses are placed on top of the base layer at least 300 mm (12 in) away from bin walls. Placement closer than this can lead to seepage of liquid through the walls. Keeping carcasses away from side walls also helps to maintain them at temperatures that speed decay and kill disease-causing microorganisms. Carcasses should not touch each other; too many carcasses in one spot leads to localized wet spots and poor composting.

After the carcasses are positioned inside the bin, they are covered with 100 to 150 mm (4 to 6 in) of poultry litter. Incomplete coverage can lead to fly problems.

Layering of carcasses and poultry litter continues until the bin is filled to a depth of about 1.2 m (4 ft), at which point it is capped with 300 mm (12 in) of dry poultry litter. In a properly operating compost operation, new material added to the bins reaches temperatures of 50 to 65 °C within 24 to 48 hours.

If dry broiler litter is not available, a mix of one part caged layer manure with 0.2 parts straw or sawdust by weight can be used as a substitute.

### Two Stage Process

After a bin is completely filled, it must undergo a primary heating phase lasting 10-14 days. During this time, rapid microbial action depletes the oxygen within the bin, the rate of decay slows, and temperatures may begin to fall.

Following the first phase, the partially composted waste is removed from the primary bin and placed in a secondary bin. The mechanical action of moving the compost breaks up the pile, redistributes excess moisture, and introduces a new oxygen supply. Once this takes place, a secondary heating cycle occurs, accompanied by further decomposition.

By the end of the secondary heating phase, carcasses as large as 7 to 9 kg (15-20 lb) are normally reduced to bones that are reasonably clean and free of tissues that cause odors and attract insects and predators.

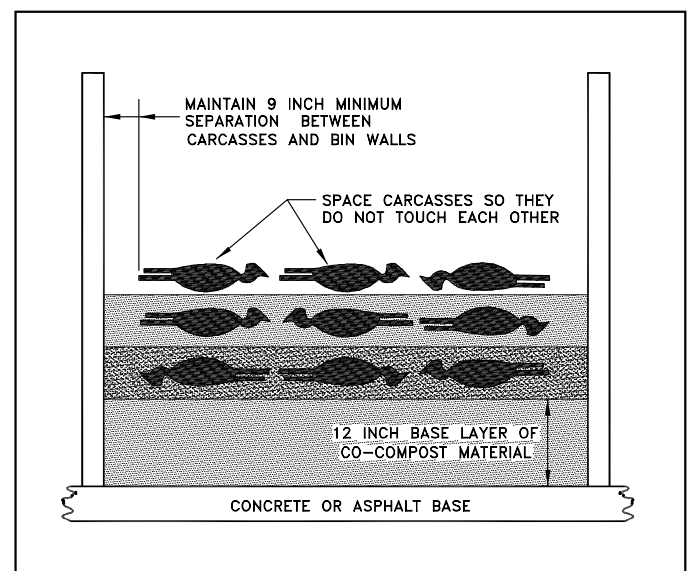


Figure 1 Composting Bins Are Loaded In Layers

Large birds weighing 7 kg (15 lb) or more, may need a third heating phase to achieve complete decay, particularly if compost moisture content falls outside the optimal 50-60% range. If large birds constitute a major portion of daily flock losses, it is advantageous to compost large and small carcasses separately. This minimizes the amount of bin space tied up in a third heating cycle that is not needed for small carcasses

## Monitoring the Composter

Temperature is a good indicator of the "health" of the compost process. A probe-type dial thermometer with a 1 m (36 in) stem is a good instrument for monitoring temperatures in bins. Temperature should be checked daily to ascertain the condition of the compost. Normally, temperatures in the primary bins should rise to the 55-65 °C range in one or two days, and should peak in the 60-70 °C range in 7 to 10 days. Temperature is an important parameter in the control of fly larvae and pathogens. Typical temperature profiles for primary and secondary compost phases are shown in Figure 2.

Although experience indicates that temperatures above 75 °C are rare, a remote possibility exists that temperatures could rise to spontaneous combustion levels. Conditions conducive to spontaneous combustion occur in damp, deep-piled, compacted masses of organic matter. Experience indicates that compost piles limited to 1.5 m (5 ft) in depth, with the proper porosity and moisture levels, do not present a fire hazard. Nevertheless, the potential for spontaneous combustion should be kept in mind as temperatures are monitored. If temperatures appear to be rising towards the 75 °C level at a constant, or increasing rate, the compost should be removed from the bin and spread on the ground to cool.

## Composter Design

In sizing a poultry composter, it is necessary to know, or estimate, the number and weight of birds in the enterprise, and the percent daily mortality expected. Maximum daily mortality on a weight basis usually occurs when birds are at or near market weight. Once the maximum daily mortality weight is known the number and size of composters can be calculated. See [Mortality Compost Bin Design, Factsheet No. 382.500-10](#), for information.

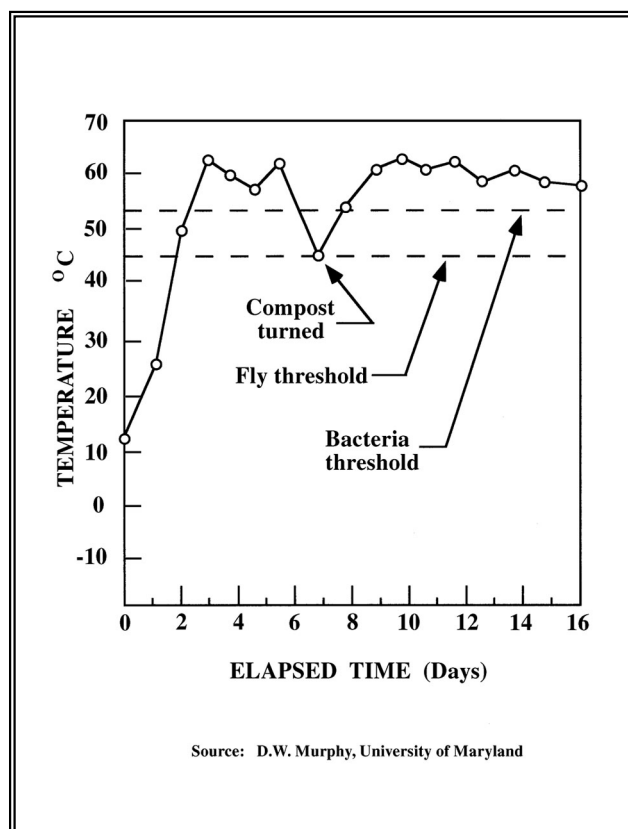


Figure 2 Typical Temperature Profile in a Two Stage Composter

This is one of a series of Factsheets on Composting. A list of references used in producing this series is included in the Composting Factsheet "[Suggested Reading and References](#)."

### COMPOSTING FACTSHEET SERIES PREPARED BY:

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