



Litter Management Challenges on New Poultry Farms

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Introduction

Commercial poultry operations are required to handle poultry litter in a way that minimizes environmental impact, while also complying with State and Federal regulations. The use of permanent manure storage structures is supported by years of scientific data. Financial assistance is available (but not guaranteed) to offset the costs of establishing permanent manure storage structures at new poultry farms. However, farmers may experience significant wait times for funding. In this factsheet, we outline the potential manure management issues encountered at new poultry operations and provide recommendations for dealing with those issues before permanent manure storage structures are available.

The recommendations for manure management procedures outlined in this document are only temporary measures. These stopgap practices are designed to be used during the period between when production begins, and a permanent manure storage structure is built.

Handling Manure Without a Manure Storage Structure

Poultry growers who find themselves without a manure storage structure must consider their options and regulatory requirements well in advance of the first litter removal (e.g., removal of crust/cake, partial or total cleanout). Poultry growers who are starting out on new bedding will most likely want to practice a litter conditioning technique that does not remove litter from the house. Litter removal from the house may not need to occur until after the second or third flock because it takes several flocks for litter depth to accumulate to the point of needing to be removed.

The minimum litter depth in the poultry house should be three inches to provide sufficient material for absorbing moisture and maintaining bird comfort.

Litter conditioning practices, like windrow composting, have reduced the need for crusting out between flocks or during times of the year when litter cannot be land-applied (Malone, 2007). Litter conditioning between flocks does not eliminate the need for litter to be removed from the poultry house; however, it gives poultry growers more time to plan where to move and store litter. Ideally, litter removal must be timed so that litter is moved straight from the poultry house to the field for field staging prior to application to cropland. Alternatively, litter removal could be timed to allow litter brokers to transport it off the farm for alternative uses.

Some temporary storage practices are available to poultry growers who find themselves with more crust or litter than they can use or store themselves. Many growers develop relationships with neighboring farmers who have the need and ability to use the crust or litter the poultry grower has available. Poultry growers can also contact the Delaware Department of Agriculture (DDA) for information about their Manure Relocation Program, please see “References” for more information. This program is designed to move manure from areas where there is excess manure to areas where manure is needed (Delaware Department of Agriculture, 2019). Funds are available to help pay for the transportation costs associated with moving the manure. DDA maintains a list of brokers that provide litter services, including transport off-farm.

Poultry growers who have applied (or plan to apply) for a CAFO permit need to be aware that manure cannot be left uncovered for more than 14 days in the production area. The production area includes the

area where animals are confined, as well as areas where manure and mortalities are stored, handled, treated, or disposed of (Delaware Department of Natural Resources and Environmental Control, 2012). After 14 days, crust or litter must be covered in the production area or moved to a roofed storage building.

Temporary Litter Storage for Use During Composting

The standard recipe for composting poultry mortalities calls for poultry litter and a carbon source like sawdust, mulch or wood shavings/chips. Crust (or cake) is not recommended for composting mortalities due to its high moisture content, density, and texture. Crust (or cake) is a wet, dense mixture of manure and bedding that contains between 40% and 60% moisture (Macklin et al., 2008). Litter (i.e., whole house cleanout) is drier, with an ideal moisture content between 20 and 25% (Ritz et al., 2017) and is recommended for use when composting mortalities.

New poultry growers may not have litter on hand to use for composting. As a substitute, poultry growers may consider using litter from a nearby farm. Importing poultry litter from another farm is not recommended because this practice could compromise biosecurity on the receiving farm. Instead of importing litter, new poultry growers are encouraged to use sawdust or wood shavings as the bulking agent for composting mortalities from the first flocks until enough litter is produced on the same farm.

When enough litter becomes available for composting, this litter should be stored near the composters. Follow the guidelines for the construction of a temporary composter available in the University of Delaware publication [Temporary Mortality Management on New Poultry Farms](http://www.udel.edu/0013622) (available at <http://www.udel.edu/0013622>) if a permanent composting structure has not been built. Ideally, the litter stockpile should be kept on the same footprint where the permanent manure storage structure will be

built. The temporary stockpile is to be located in an area that is: 1) elevated or does not flood, 2) near the composter, and 3) surrounded by grass. The stockpile of litter must also be located outside the work zone, which includes roadways used for live haul, feed, fuel, and chick delivery.

The temporary stockpile of litter for composting is to be kept in a six-foot conical pile (Shober & Riggi, 2025). The stockpile needs to be placed on a concrete or compressed clay pad. If an impermeable pad is not available, the stockpile is to be kept in an area where the footprint can be cleaned up as the pile is used (Figure 1). The litter stockpile must always be covered to minimize contact of the litter with rainwater. Compost fleece is the best option for covering a temporary composting litter stockpile; a woven tarp is the next best option, with the exception of polyethylene tarps. Polyethylene tarps tend to cause condensation, which increases the risk of nutrient loss from the litter.



Figure 1. A stockpile of litter that is in the process of being covered. (Photo credit: Nutrient Management Program, University of Delaware).

The tarp will need to be secured around the edge to prevent the tarp from being blown off by the wind. One suggestion for anchoring the tarp is to fill 4-foot-long sections of 4-inch PVC pipe with sand, cap the pipes, and place the pipes on the edge of the tarp near the base of the pile (Kaufman et al., 2000). When manure is stockpiled under cover, gas can accumulate; take care not to inhale the built-up gas when removing the tarp (Kaufman et al., 2000). Also, litter contains many bacteria that generate heat. The

temperature of litter stockpiles should always be monitored with a thermometer in several locations on the stockpile to prevent fire. Litter stockpiles that reach a temperature of over 170°F are at risk for combustion.

The temporary stockpile of litter must be located away from public roadways, surface water, wells, and private residences; follow all local, State, and Federal regulations. We recommend following the minimum setback distances mandated for temporary field staging of poultry litter when siting a litter stockpile in the production area (Delaware Nutrient Management Program, 2016). The litter stockpile is required to be located at least:

- 100 feet from a public road
- 100 feet from surface water
- 200 feet from a private well
- 300 feet from a public water supply well
- 200 feet from any residence not on your property

Growers should be mindful of the odors that can come from a stockpile of litter and consider potential odor issues when choosing the litter stockpile site. Being mindful of odors and other production related issues will help growers establish good relationships with their neighbors and make them a good representative of the poultry industry.

Keeping Enough Litter on Hand for Composting Mortalities

The amount of litter a poultry farm keeps on hand for composting mortalities is based on the capacity of the farm and the finishing weight of the live birds. Often, the amount of litter needed to compost mortalities properly is underestimated, leading to inefficient and ineffective composting. As a rule of thumb, there should be two buckets of litter and one bucket of carbon (e.g., pine shavings or sawdust) available for composting every bucket of mortality. The total amount of litter required to properly

compost will vary based on the number of birds in the flock, the finishing weight, and the mortality (Table 1). For example, approximately 150 cubic feet (ft³) of poultry litter (approximately 1/3 of an average-size dump truck) is needed to properly compost 20,000 birds with a finishing weight of 8.5 lb and a flock mortality rate of approximately 5%. If a dump truck holds 450 ft³ of litter, then approximately two dump truck loads of litter are needed to compost the average mortalities from a flock of 120,000 birds (Table 1).

Poultry operations without permanent manure storage options should only keep the amount of litter needed to properly compost mortalities on the farm. All remaining litter must be relocated off the farm until a permanent manure storage structure is built.

Final Considerations for Manure and Mortality Management

Managing manure on a poultry farm is complex. Poultry litter is a valuable commodity when managed and handled properly. Poorly managed and handled litter will have a negative impact on the environment, farm biosecurity, and neighbor relations. The litter storage practices outlined in this document are meant to be temporary. These practices are not appropriate as permanent solutions for storing manure on a poultry farm. New growers need to remain engaged in the process of constructing permanent litter storage facilities on their farms to enable long-term manure management practices. Management practices are constantly evolving and changing. As such, new poultry growers may want to consider alternatives to traditional practices, particularly for mortality management. For example, mortality freezers and in-vessel composters are acceptable mortality disposal techniques.

Table 1. The amount of litter needed to compost mortalities based on farm capacity and finishing weight.

Total Birds Placed per Flock	Cubic feet of litter needed for composting birds finished at 4.25 lb	Approximate number of dump truck loads of litter needed per flock	Cubic feet of litter needed for composting birds finished at 8.5 lb	Approximate number of dump truck loads of litter needed per flock
60,000	225.0	0.5	450	1.0
70,000	262.5	0.6	525	1.2
80,000	300.0	0.7	600	1.3
90,000	337.5	0.8	675	1.5
100,000	375.0	0.9	750	1.7
110,000	412.5	0.9	825	1.8
120,000	450.0	1.0	900	2.0
130,000	487.5	1.1	975	2.2
140,000	525.0	1.2	1,050	2.3
150,000	562.5	1.3	1,125	2.5
160,000	600.0	1.4	1,200	2.7
170,000	637.5	1.4	1,275	2.8
180,000	675.0	1.5	1,350	3.0
190,000	712.5	1.6	1,425	3.2
200,000	750.0	1.7	1,500	3.3

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