

Bin sizing worksheet

Step 1. Estimate your operation's yearly death loss, in pounds of carcass. *Example: A 250-sow farrow-to-finish operation estimates 17,200 pounds of carcass per year.*

Your value: _____

Step 2. Divide the total yearly death loss by 365 – the number of days in a year. *17,200 divided by 365 gives 47 pounds carcass per day.*

Your value: _____

Step 3. Multiply the daily death loss by 20 – the cubic feet of bin volume needed to compost one pound of carcass per day. *For our example, 47 times 20 is 940 cubic feet.*

Your value: _____

Step 4. Divide the total cubic feet of bin volume needed by the bin height – a height you pick for convenience, but usually 3-5 feet. This gives the total required surface area of the composter. Picking a bin height too large makes it hard to manage moisture. *The producer uses 4 feet as the bin height. 940 divided by 4 gives 235 square feet.*

Your value: _____

Step 5. Divide the total required surface area by a trial bin width – a minimum of one foot wider than the loader bucket you'll use to manage the composter. This gives you a length of bin required. If this bin length is too long, divide it into two or more bins. *The producer chooses 10 feet width to accommodate his loader bucket. 235 divided by 10 is 23.5 feet long. The producer decides to use two bins each 12 feet long, 10 feet wide, 4 feet deep.*

Your value: _____

Step 6. The calculation in Steps 1-5 size the primary bins. Plan the same number and size of secondary bins. *The producer builds two primary and two secondary bins, plus a bin to store carbon source material.*

Your value: _____

For more information on Illinois livestock regulations, www.livestocktraining.com

Carcass Composting Basics



Since 1995, Illinois Dead Animal Disposal rules have allowed on-farm composting of poultry and swine carcasses.

Beginning October 1, 2004, a rules change allows composting of cattle, sheep, and goat carcasses.

INTRODUCTION

Producers looking for a good alternative method of carcass disposal may want to try composting.

Done correctly, composting can be an environmentally friendly, readily managed method that fits many operations.

Carcass Composting How-To

LOCATING A GOOD SITE FOR THE COMPOSTER

Locate the composter in an area where runoff will not contaminate water supplies or allow leachate to discharge into streams, ponds or lakes. Stay more than 200 ft. from a stream, private potable water supply well, or 400 feet from a public potable water supply source. The composter must be at least ¼ mile from the nearest occupied residence (other than one located on the same property as the facility). Divert surface water away from the composter. Have a source of water available for adding moisture to the compost.

SIZING THE COMPOSTER

Size the composter based on the farm's projected mortality rate. See the "sizing worksheet" for the formula.

Make **primary** and **secondary** bins. The carcasses and carbon source material are loaded into the primary bins first, and go through a heat cycle. Then each primary bin's contents should be moved into a secondary bin for a second heat cycle to finish composting. Moving the compost from primary to secondary bins serves to mix and aerate the material, giving the composting organisms the opportunity to re-energize the process.

CONSTRUCTION AND MATERIALS

A compost facility constructed of a concrete slab, with treated lumber or concrete bin walls and a roof is best. Roofing provides the producer with more control to regulate the amount of moisture during both wet and dry weather, which is important for proper composting. The solid floor and outside apron allow for easy access to turn the pile or adding materials to the pile during wet, muddy conditions. A compost setup made of big round hay bales is not recommended as a permanent installation.

CARBON SOURCE MATERIALS FOR CARCASS COMPOSTING

Compost "recipes" vary by animal species, but generally you will need about 3.7 cubic yards of compost material per 1,000 pounds of carcass composted. Coarse sawmill sawdust, shredded corn stalks, chopped straw, coarse-ground corn cobs, and other materials possessing like properties and having similar particle size are recommended.

Start with a generous layer of carbon source on the composter base. Then add the carcass, and cover it all around with a generous blanket of carbon source material. Add water if necessary. The carbon source material should be at about 40-60% moisture content. Add carbon source material to the pile periodically as the carcass breaks down, in order to keep plenty of cover over the carcass (check the composter as part of your daily routine).

COMPOSTER OPERATION

Obtain a 36 in. probe-type windrow compost thermometer to check the temperature of the compost pile. Record the deep-pile temperature daily until you gain experience with carcass composting and know what to expect. Desirable temperatures are in the range of 130-150 degrees F. and the pile in the vicinity of "active" composting should stay at that temperature for several days. The carbon source and carcasses may be placed in the bin until the bin is full.

Once the temperature begins to fall from the peak, move the entire pile to the secondary treatment bin. The composting process should be monitored and managed in such a way that heating and decomposition can proceed to completion. Typically it takes about 3 months in the primary bin for larger carcasses, from the time the last carcass is placed in the bin, and another 3 months in the secondary bin from the time the compost is moved into the secondary bin from the primary bin. Add water as necessary to adjust the moisture content of the compost and promote further composting.

DISPOSING OF FINISHED COMPOST

The compost should be agronomically distributed over cropland. N, P, and K in the compost should be figured in with the field's nutrient management plan. Some of the finished compost can be reused in the primary bins

TROUBLESHOOTING CARCASS COMPOSTING

Odors: As long as you add sufficient carbon source to the pile and keep the carcass covered, odors should not be a problem. You may have odors emitted briefly when you turn the primary bin and move its contents to the secondary bin.

Scavengers: You may have to fence the composter, but usually keeping the carcass well covered with carbon source is sufficient to keep odors down so that digging scavengers are not attracted.

Leaching and runoff: Grade around the composter to keep clean storm water away from the bins. Don't overwater the compost. Use proper type and sufficient amounts of carbon source materials.

Slow composting rate or low temperatures: Adjust moisture as needed. In winter it is difficult to "jump-start" decomposition of a cold carcass. Sometimes adding a little fresh manure to the mix helps.



Swine, cattle, sheep and goats

Composting large animals can present more of a challenge than small carcasses. Pay particular attention to keeping the carcasses covered, and the moisture content of the pile within the correct range. Use the compost thermometer often and record the temperatures.

For easier management of composting for a farrow-to-finish operation, consider composting only the pigs that are less than about 75 pounds and rendering the larger hogs, especially until you get the knack of composter management.

For carbon source material, the composter bin width should allow for 1 foot of space all around the largest carcass. At the least it should be 1 foot greater than the width of the loader bucket used for turning the compost.

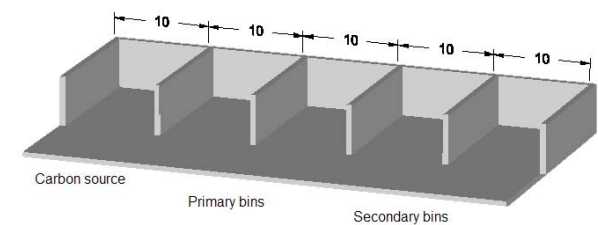
Carcasses weighing more than 300 lb. will compost better if they are processed prior to covering with the carbon source material. For instance, opening the abdominal cavity will reduce distention of the carcass with gases, making it easier to keep the carcass covered; and incising the large limb muscles will facilitate contact with the carbon source material. Large carcasses can be hard to keep covered. Visit the composter daily and make sure you have enough carbon source material on top of the carcass to provide a thick blanket all over. This will discourage scavengers and reduce odor problems.

Monitor the temperature of the pile using the 36" thermometer, and record the temperatures and date. Composting temperature in the center of the pile should reach 130-150 degrees F. for an extended period. Three or four months after the last carcass is placed in the bin, use a bucket loader to move the pile into the secondary bin. Add water if necessary. Check the temperature in the secondary bin to make sure it re-heats.

Following the second heat cycle (another 2 to 4 months) the compost should be ready to spread on a field. You may have some large bones remaining, but they can be put back into the primary bin for further breakdown.



Swine composter. Locate the composter where stormwater will not drain into the pile, and always use enough carbon source material to absorb all liquids from the pile. Roofed composters are easiest to manage.



Composter sized for 100-cow dairy. Use roofed structure for maximum control of compost moisture.

Poultry

Bird carcasses compost rapidly compared to larger animals because birds' surface area to body mass ratio is larger. Microorganisms decompose the carcass from the outside in, so it takes less time to complete. A common "recipe" for poultry composting is a layer of straw, a layer of birds, and a layer of litter or poultry manure.



Poultry composter with front opened to remove compost.

Where to buy a compost thermometer

- 1) Reotemp heavy duty (5/16" by 36") windrow composting type. www.retoemp.com, 1-858-784-0710
- 2) Omega heavy duty (5/16" by 36") windrow composting type. www.omega.com, 1-888-TC-OMEGA