Water Quality

Focus Area
Nutrients & Bacterial Waste

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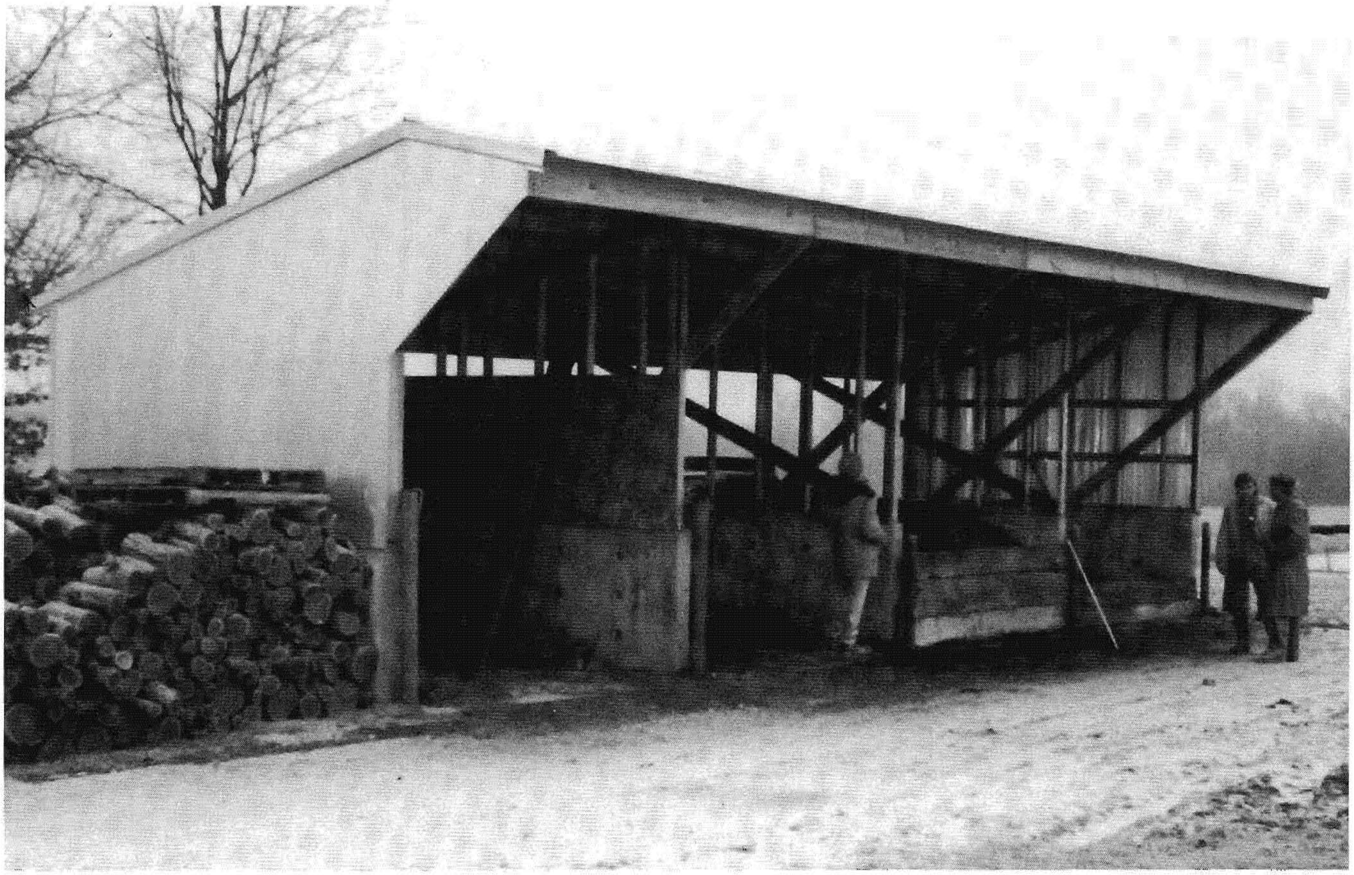
Composting Dead Swine



This roofed composter has concrete bin walls with a roof overhang to protect the work area.

Acknowledgements

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Composting Dead Swine

The Missouri Dead Animal Law requires that a dead animal carcass be properly disposed of within 24 hours. In Missouri there are five acceptable methods of carcass disposal. They are: rendering, composting, landfilling, incineration and burial. This publication discusses composting as a means of complying with the dead animal law for swine operations. For information on the other methods, refer to MU publication WQ 216.

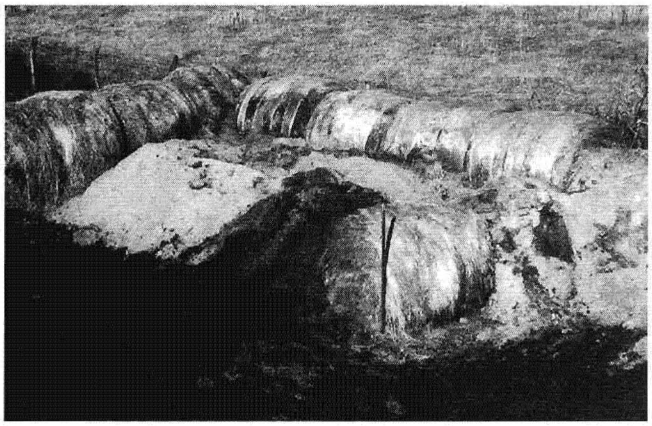
Composter location

The composter should be located away from areas of sensitive water quality such as streams, ponds and wells. A location at or near the crest of a hill will eliminate or minimize the amount of surface water approaching the composter from higher areas. If a composter must be located in the lower part of a slope, a diversion terrace should be constructed around the upper side of the composter to keep surface water out.

When locating a composter, consider the farm residence and any nearby neighbor residences that might be affected. While offensive odors are not generated if the composting process is properly managed, the handling of dead swine and compost on a daily basis may not be aesthetically pleasing. Also, consider traffic patterns required in moving dead swine to the composter, moving the required ingredients to the composter and removing finished compost from the composter. The composter site should be well-drained and provide all-weather capability for access roads and work areas.

Composting ingredients and recipe

Composting dead swine requires the addition of a carbon source to ensure proper carbon/nitrogen ratios are present for the composting process.



This composter, constructed with large, round bales, serves a 120-sow farrow to finish operation.

Sawdust Requirements

One half cubic yard of sawdust per sow in the herd for farrow-to-finish operations (annually) or

100 cubic feet (about 4 cubic yards) of sawdust per 1000 pound carcass composted

Nitrogen addition

Up to 3 pounds ammonium nitrate per 100 pounds swine carcass as needed, mix with sawdust

Water addition

If sawdust is dry, add water to obtain a damp feel and appearance, up to 1 to 1½ gallons per cubic foot of sawdust

Composter Size

20 cubic feet of primary and secondary bin volume per pound of carcass composted daily

size bins for floor area of 100 to 200 square feet, and depth of 5 to 6 feet

Temperature

130 to 160 degrees F indicates active composting

Time

compost three months in primary bins, and an additional three months in secondary bins

Table 1. Summary of swine composting design and management criteria.

Experience thus far suggests that sawdust an ideal carbon source due to its small particle size, ease of handling, absorbency and high carbon content. Experience using straw as the only carbon source has been less successful, with lower composting temperatures, leaching of fluids from the composting pile and longer composting times required. When sawdust is used as a carbon source, plan to provide about 100 cubic feet of sawdust per 1000 pounds of carcass to be composted. For farrow-to-finish operations, sawdust requirements are about one-third to one-half cubic yards per sow in the herd on an annual basis. See Table 1 for a summary of compost criteria.

A precise carbon/nitrogen ratio does not seem to be necessary to obtain good composting, and most composting with sawdust as the carbon source has been done without adding supplemental nitrogen. However, if sawdust is used according to the above recommendations, some supplemental nitrogen would have to be added to obtain the ideal carbon/nitrogen ratio of 25. The addition of about 3 pounds of ammonium nitrate (NH_4NO_3) in the dry, granular form per 100 pounds of swine carcass will

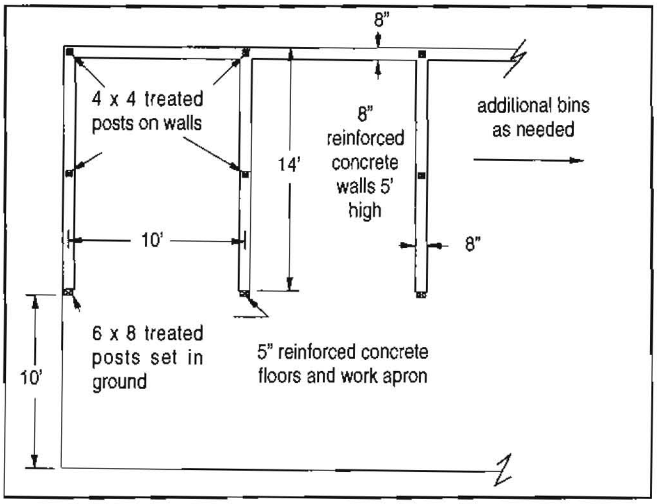


Figure 2. Schematic top view of a roofed composter with concrete bin walls.

	wt. range lbs.	avg. wt. lbs.	Annual death loss, percent	Annual death loss per animal space, lbs.
Sow herd[1]	350-400	375	6-8	21-32
Nursery[2]	13-50	32	22-26	3-13
Finishing	50-250	150	10-12	5-30

[1] Includes all mature animals, farrowing, gestating, and boars
[2] Includes losses in farrowing house prior to weaning

Note: Death losses can vary significantly from the values shown above depending upon genetics, management, environmental conditions, and many other factors.

Table 2. Average annual death loss for swine in confinement.

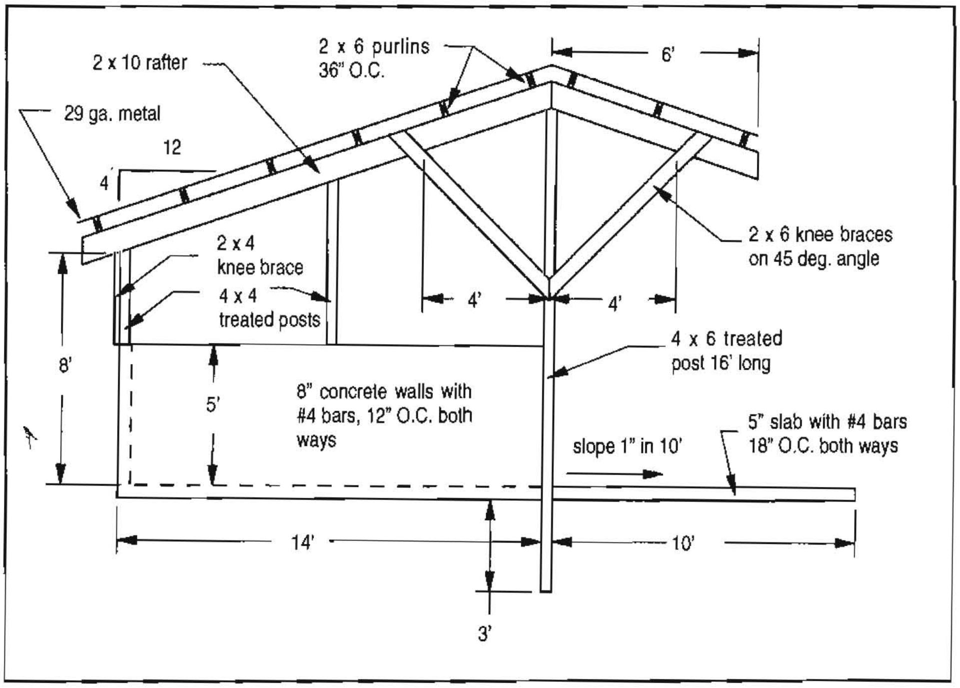


Figure 3. Schematic side view of a roofed composter with concrete bin walls.

ondary phases. It may be necessary to extend this period of time if an unusual number of large carcasses are composted, or if ambient temperatures are low enough to slow the composting process.

In most cases a minimum of three bins will be required, two of which are used for primary composting and the third for secondary composting. In the typical scenario, Bin 1 is filled with three months' death loss, at which time Bin 2 is started. At the end of the second three-month period, Bin 2 is full, and the last carcasses placed in Bin 1 have composted for three months. The contents of Bin 1 are then ready to move to Bin 3 for the secondary composting phase.

After three months of secondary composting, the material can be moved out and applied to land, and the secondary bin is available to receive the contents of Bin 2. Larger operations will require more than the minimum three bins; experience has shown that having extra bins available for storage of fresh sawdust and finished compost is beneficial.

Total bin area and volume requirements depend upon the size of operation and death loss incurred. Actual past death loss data should be used in sizing composters for existing operations. For planning purposes and sizing composters for new operations, see the average death loss data in Table 2. A minimum of 20 cubic feet of volume is needed in both primary and secondary bins per pound of carcass composted daily. Bins are typically filled to a depth of 5 to 6 feet for composting. While bin configuration is not critical, bins are usually laid out as three-sided enclosures. The open side should be wide enough (at least two feet wider than bucket width) so that the bin contents are easily accessible with a front end or skid-steer loader. Square bins offer the greatest opportunity for reduced side effects, (heat loss through walls), although length:width ratios of up to 2:1 are acceptable. Primary and secondary bins should be located close or adjacent to each other (perhaps with a common wall) to facilitate moving compost from bin-to-bin. Excessively large bins should be avoided. Experience has shown that bins with 100 to 200 square feet of surface area work well. See Table 1 for a summary of composter design criteria.

Composter construction

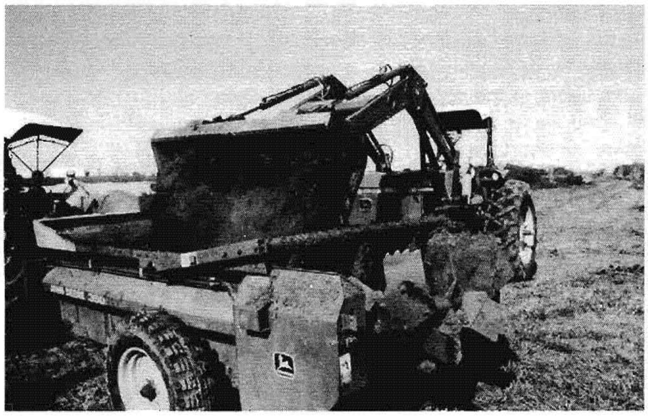
Prior to constructing a composter, you must decide whether or not a roof over the composter is preferable. Current Missouri regulations do not require a roof or concrete floor in a swine composter, provided that sawdust is used as the carbon source in the composter. Properly mounded and landscaped sawdust effectively sheds water; leaching of fluids from the bottom of properly managed swine composters does not occur. The use of other carbon sources, such as straw, may require a roof to exclude rainwater and leaching from the pile. Limited experience has shown that use of less absorbent carbon sources like straw may result in leaching and less effective composting even though the composter is roofed.

The primary advantage of an unroofed composter is reduced cost. Advantages of roofed composters include: fewer weather effects on the composting process; worker protection during inclement weather; and a more aesthetically pleasing appearance to match other buildings in the production unit.

Field experience suggests that composting bins can be constructed using large round bales (5 to 6 feet in diameter) of low-quality hay. Bales are placed end-to-end to form walls for three-sided enclosures or bins. A layout three bales deep and two bales wide as shown in Figure 1 has worked well for swine composters.

Another alternative for the unroofed composter is to use concrete for the bin floor and walls. Although more costly, the concrete is a more durable construction material and is less subject to weathering and mechanical damage during cleaning operations. Also, less room is required than a similar composter using large round bales.

Figures 2 and 3 are schematic drawings of one possible configuration for a roofed composter. This design uses concrete bin walls and floor and pole construction for end walls and roof. The roof overhang and concrete apron in front of the composter minimize rain blowing into the bins and provide a solid work area in front of the composting bins. Many other layouts and materials and could be used in constructing a composter.

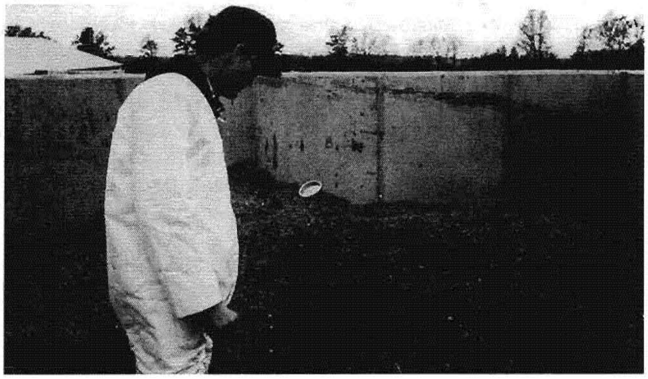


A front-end loader and beater-type spreader work well for loading and field-spreading compost.

Equipment requirements

Although composting is a simple process, certain equipment is necessary for good management of the operation.

Some type of front-end or skid steer loader is the most necessary piece of equipment in a composting operation. The loader is needed to move carcasses from the production buildings to the composter. Although small carcasses can be deposited and covered in the composter by hand, larger carcasses cannot be adequately managed by hand. The loader provides a means to properly place larger carcasses in the compost pile and adequately cover the carcasses with sawdust of finished compost. The loader is also needed to move compost from primary to secondary bins and can be useful in receiving, storing and piling fresh sawdust from the sawmill. Finally, the loader is necessary for loading out finished compost for field spreading.



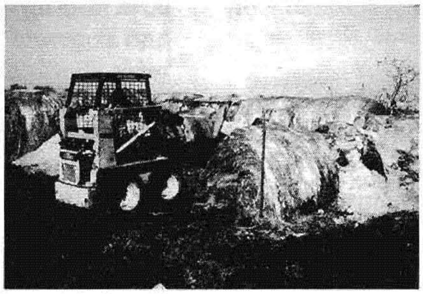
Temperature is the best indicator of the conditions of the composting material.

A probe-type thermometer will aid in monitoring the compost to determine if it is composting properly. Dial-type thermometers with a minimum 36-inch stainless steel stem allow measurement of temperatures in the interior of the composting pile. Temperatures should rise to the 130 to 160 degree F range for good composting.

A manure spreader should be available for field spreading finished compost. A conventional beater-type spreader for handling solid manure is also adequate for land applying finished compost.

A logbook is a useful record-keeping tool in a composting operation. Dates and weights of carcasses placed in the composter provide a record of death

Steps to proper placement of carcasses in the composter: 1. Dig out a cavity with the loader.



2. Place the carcass in the cavity.

3. Cover the carcass with finished compost to add heat and bacteria.

1. Start a primary composting bin by placing enough sawdust in the bin so that there is at least one foot under and around the first carcasses placed in the bin. Carcasses placed directly on dirt or concrete floors, or against bin walls will not compost properly.

2. Place carcasses in the primary bin as necessary. It is very important to use sufficient sawdust so each carcass is covered on all sides with a minimum of one foot of sawdust. Small pigs may be grouped or placed with less sawdust between carcasses, but a one foot covering between carcasses and the pile surface should always be maintained to minimize odors and rodent problems. Never leave hoofs, legs, ears, or snouts sticking out of the sawdust pile. Most problems in swine composting arise when insufficient sawdust is used in covering carcasses. Use a pointed rod or dowel to measure the thickness of the sawdust cover. Large carcasses may need to be recovered after a day or two as the sawdust settles around the carcass. Keep the surface of the pile shaped so that it will shed rainwater out the front of the bin if the composter is not roofed. Do not allow pockets to form in the bin corners or elsewhere that will pool water.

Carcasses placed in warm sawdust begin composting more quickly. This can be accomplished by overfilling sawdust over the previous carcasses. This allows the sawdust to heat up so that the next carcass is then buried in this pre-warmed sawdust. The loader bucket is used to "wallow-out" a cavity in the pre-warmed sawdust, and the fresh carcass is placed in this cavity. If finished compost is available, it should be used to cover the carcass to provide additional heat and bacteria to start the composting process. Fresh sawdust should then be used to provide the final cover thickness needed so a new cavity can be provided for the next carcass.

3. Monitor temperature of the composting pile with a long-stem, dial-type thermometer. When composting is proceeding properly, temperatures will reach 130 to 160 degrees F. If a thermometer is not available, you can obtain a rough indication of temperature by inserting a steel rod in the compost pile and feeling how hot it is when you pull it out. Primary bins started during cold weather may not begin composting immediately. However, if carcasses are buried with the proper amounts of sawdust, composting should begin on its own as temperatures warm up in the spring. There is usually enough heat in active (as opposed to newly started) compost piles to continue composting through cold weather, regardless of ambient temperature. If sawdust is used as recommended, the insulation effect is sufficient to minimize the effects of ambient temperature.

4. After the last carcasses placed in the primary bin have composted three months or longer, move the contents to a secondary bin. This step provides mixing and re-aeration of the material so that the compost will "finish off" properly.

5. After the pile has composted another three months in the secondary bin it should appear as a dark, granular, nearly black, humus-like material with very little odor. Some resistant parts such as teeth may still be identifiable, but should be soft and easily crumbled.

6. Use the finished compost as noted above for a "starter" material on the new carcasses being composted in the primary bin. This provides heat and bacteria to enhance starting of the composting process. Experience has shown that up to 50 percent of the sawdust requirement for composting can be filled using "recycled" finished compost. However, plan to use fresh sawdust in the amounts noted for starting up a composting operation until sufficient finished compost becomes available. Haul and spread finished compost as needed using a conventional manure spreader. Apply finished compost at agronomic rates for the crop being grown. Obtain a laboratory analysis of the compost for nitrogen (N), phosphate (P_2O_5), and potash (K_2O) for precise fertilizer content. The following table gives average values of fertilizer nutrients from several samples of finished swine compost.

	Fertilizer nutrients, lbs./ton wet basis				
	Dry Matter	Total Nitrogen	Ammonia Nitrogen	P_2O_5	K_2O
Finished compost	1000	20	4	2	6
Fresh sawdust	800	1	0	0.2	0.4

7. Keep fresh sawdust as dry as possible because dry sawdust works better in the composting process. Fresh sawdust in a pile will shed water reasonably well if the pile is mounded, with no pockets or depressions.

8. Keep the area around the composter mowed and free of tall weeds and brush. Watch for any leaching that might occur. Using more sawdust in the bottom of the bins can help eliminate leaching.

Table 3. Steps in operating and managing a swine composter.

losses and a basis for improving death loss statistics. Temperature readings, amounts of fresh sawdust inventoried and used and dates when compost is transferred from primary to secondary bins are record-keeping items that can aid in managing the composting operation. Finally, dates and amounts of finished compost removed for land spreading also provide data for future management and planning.

Composter operation and management

Although composters are simple and relatively easy to operate and manage, certain steps and procedures are necessary to ensure that the process proceeds properly. Table 3 *(see page 6)* outlines the steps which should provide acceptable finished compost in a swine operation.

Frequently asked questions

Certain questions regarding composting frequently arise. Some of these questions and answers are as follows.

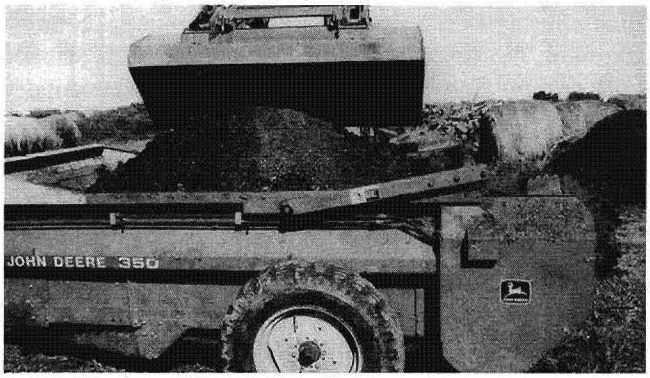
Doesn't a dead animal compost stink, and attract rodents and dogs?

If carcasses are properly covered with sawdust (one foot recommended), odors are sufficiently suppressed or absorbed so that they are not a problem in most cases. When operated properly, composters do not add to, or increase odor levels around a production facility. Using too little sawdust is the single greatest factor in excess odor and associated rodent problems. It is important to prevent a rodent problem when starting up a composter, because once rodents learn the composter is a source of carcasses, they can be difficult to stop.

What happens in the wintertime when temperatures are cold?

In general, the warmer the ambient temperature, the better the composting process works. However, an active compost pile contains considerable heat which, with the insulating effect of the sawdust, minimizes effects of ambient temperatures. Interior pile temperatures of 130 to 160 degrees F are typical in properly operating composters when ambient temperatures are as low as zero degrees F. Cold or frozen carcasses placed in cold (fresh) sawdust will not begin composting during cold weather. However, carcasses placed under these conditions will begin to compost as ambient temperatures warm up in the spring.

Carcasses placed in an active compost pile during cold weather should begin composting as heat is absorbed from the composting mass. Covering the



Properly finished compost is a dark granular material resembling humus.

carcass with warm or hot finished compost from an active secondary bin will further enhance composting fresh carcasses in cold ambient temperatures.

How large a carcass can be put in the composter?

Mature sows and boars (300 to 600 pounds) have been successfully composted. Longer composting times are required for larger carcasses. However, six months of active (temperatures 130 degrees F or above) composting time should be sufficient for most swine carcasses. These carcasses are composted whole (no cleaving or cutting up of the carcass).

Will Missouri DNR approve this type composter in a waste management plan?

The primary concern of the regulatory agency is to prevent contamination of ground or surface water. Hence, any contamination problem arising from a composter (or any other part of the production facility) would have to be corrected. Contamination potential from composters located and operated as indicated in this publication is quite low. Under current policy, Missouri DNR will approve unroofed swine composters if sawdust is used as the carbon source and the composter is properly managed. Use of other carbon sources such as straw will likely require a roofed structure to minimize water absorption and leaching.

What should the finished compost look like?

Properly finished compost should appear as a dark, nearly black granular material resembling humus or potting soil. It may have a slight musty odor. Some resistant bones (skull parts, teeth) will be visible, but they should be soft and easily crumbled by hand.

What about diseases, flies, and pathogens?

Temperatures above 140 degrees F normally occur at some time in the composting pile. This is sufficient to destroy pathogens and prevent fly incubation. Good coverage of the composting pile with sawdust eliminates the fly breeding and incubation environment. No disease outbreaks have been associated with composting to date. Spreading finished compost in fields or pastures helps assure that disease organisms do not find their way back to the production area.

I do not have sawdust available. Can I use something else for a carbon source?

Any granular organic material with a high carbon content should be a candidate as an ingredient in composting. Most successful swine composting thus far has been accomplished using sawdust as the carbon source. More research and experience is needed to evaluate other carbon sources such as straw, hay, rice hulls and cornstalks. A long, fibrous material such as straw or cornstalks would likely work much better for composting if it were ground to reduce the particle size similar to that of sawdust. This would allow the material to settle around the carcass and provide the contact needed for good bacterial activity.

Can finished compost be used as a partial or full substitute for fresh sawdust in the primary bin?

Experience to date indicates that up to 50 percent of the fresh sawdust requirement may be fulfilled using finished compost. It is unlikely that long-term viability of the process could be maintained if no fresh sawdust were used, as the source of carbon would eventually be exhausted. Advantages of recycling finished compost include: less fresh sawdust required, active bacteria and heat contained in finished compost and less finished compost to haul for land spreading.

What happens if the composting process fails, or leaching occurs?

Excessive moisture in the composting pile is the most frequent cause of leaching and failure of carcasses to compost properly. The use of adequate amounts of dry or nearly dry sawdust is the best way to eliminate excessive moisture. Any surface water should be diverted around and away from the composter. If a composting pile becomes too wet, it can usually be recovered by moving it to another bin, and mixing in additional dry ingredients during the moving process.

What should I do with finished compost?

Finished dead animal compost, which is not recycled in primary bins, should be spread following agronomic practices used for spreading manure. Compost should be spread at agronomic rates so that applied nutrients do not exceed the uptake capabilities of the crop being grown. Conventional "beater-type" manure spreaders are ideal for handling and spreading compost. Care should be taken not to spread compost in or near sensitive areas such as streams, lakes, ponds, sinkholes, public rights-of-way and road ditches.

Can I compost in just one step, rather than moving the material from primary to secondary bins?

Moving compost from primary to secondary bins provides mixing, adds oxygen, and allows the compost to "finish off" with a high degree of breakdown. The success of the primary/secondary approach has been demonstrated in many other areas of composting, as well as swine. Some producers have reported acceptable results with single-step composting, but total composting time may be longer than that required for primary/secondary composting. Also, bin volume requirements are not reduced by single-step composting.

What about using "green" or wet sawdust?

Generally, the dryer the sawdust, the better, since dryer sawdust can absorb more water. However, producers have reported success when using green sawdust for some or all of the fresh sawdust requirement. Sawdust containing excessive moisture may freeze into chunks in the winter, making it difficult to handle and place around carcasses.

Will composting work for larger carcasses such as cattle?

Experience with large swine carcasses (600 to 700 pounds) suggest that cattle carcasses could be composted in this manner if properly managed. Large cattle carcasses will be more difficult to handle and properly place in a composter. Required composting time is proportional to carcass weight, hence large cattle carcasses may require up to a year of active composting time. Also, more movement, mixing, and aeration of the composting pile may be necessary. It is likely that more sawdust per pound of carcass will be required with cattle carcasses due to the amount required for adequate coverage of the legs and head. No experience has been gained to date to provide information similar to that in Table 1 for cattle.

Sizing a composter

The examples on the following pages, used with the Swine Composter Worksheet, illustrate a method of sizing a swine composter, and estimating annual sawdust requirements:

Example 1. Size a composter for a 200-sow, farrow-to-finish operation. Use data in Table 2 to estimate death loss. Estimate annual sawdust requirements. There are 200 mature animals (sows, boars, gilts), 700 nursery pigs, and 1640 finishing pigs in the operation.

Swine Composter Worksheet

1. Calculate weight of carcasses composted. Use data from actual experience, or Table 2.

Sow Herd
sows x avg. wt. x % (Table 2)/100 = lbs. loss/yr

_200_ x _375_ lbs. x _7_ %/100 = _5250_ lbs./yr

Nursery
pig spaces x avg. wt. x % (Table 2)/100
= lbs. loss/yr

_700_ x _32_ lbs. x _24_ %/100 = _5376_ lbs./yr

Finishing
pig spaces x avg. wt. x % (Table 2)/100
= lbs. loss/yr

_1640_ x _150_ lbs. x _11_ %/100 = _27,060_ lbs./yr
Total = _37,686_ lbs./yr

lbs. composted daily = (lbs./yr)/365

= _37,686_ lbs./yr/365 = _103_ lbs./day

2. Calculate primary and secondary bin volume.

lbs. composted daily (Step 1) x 20
= primary bin volume, cu ft

_103_ lbs./da x 20 = _2060_ cu ft primary bin volume

lbs. composted daily (Step 1) x 20
= secondary bin volume, cu ft

_103_ lbs./da x 20
= _2060_ cu ft secondary bin volume

3. Calculate bin area (use volumes from Step 2).

bin volume, cu ft / depth (usually 5 - 6 ft)
= bin area, sq ft

_2060_ cu ft / _6_ ft = _343_ sq ft primary bin

bin volume, cu ft / depth (usually 5 - 6 ft)
= bin area, sq ft

_2060_ cu ft / _6_ ft = _343_ sq ft secondary bin

4. Calculate number of bins (at least 3 bins required).

primary bin area (Step 3) / (100-200 sq ft/bin)
= # bins

_343_ sq ft / _110_ sq ft/bin
= _3.1_ primary bins

secondary bin area (Step 3) / (100-200 sq ft/bin)
= # bins

_343_ sq ft / _110_ sq ft/bin
= _3.1_ secondary bins

5. Calculate bin dimensions.

bin depth = composting depth (usually 5 - 6 ft)
= _6_ ft depth

bin width = loader bucket width + 2 ft or wider
= _10_ ft width

bin length = bin area (Step 3) / bin width
= _110_ sq ft / _10_ ft = _11_ ft length

6. Calculate annual sawdust requirements.

lbs. composted/yr (Step 1) x 0.0037
= cu yd sawdust/yr

_37,686_ lbs./yr x 0.0037
= _139_ cu yd sawdust/yr

Example 2. Size a composter for a 2400-sow farrowing operation. Death loss data for the operation is as follows:

4 - 375 lb sows/week
200 lb small pigs and afterbirth per day

Calculate annual and daily carcass weight and enter directly in Step 1 of the worksheet.

375 lb sow x 4 sow/wk x 52 wk/yr = 78000 lbs./yr

200 lb pigs & afterbirth/da x 365 da/yr = 73000 lbs./yr

Total = 151000 lb/yr = 414 lbs./day

Swine Composter Worksheet

1. Calculate weight of carcasses composted. Use data from actual experience, or Table 2.

Sow Herd
sows x avg. wt. x % (Table 2)/100 = lbs. loss/yr

_____ x _____lbs. x _____%/100 = ________lbs./yr

Nursery
pig spaces x avg. wt. x % (Table 2)/100
= lbs. loss/yr

____ x _____lbs. x ____%/100 = _________lbs./yr

Finishing
pig spaces x avg. wt. x % (Table 2)/100
= lbs. loss/yr

____ x _____lbs. x ____%/100 = _________lbs./yr

Total = __151000__lbs./yr

lbs. composted daily = (lbs./yr)/365
= __151000__lbs./yr/365 = __414__lbs./day

2. Calculate primary and secondary bin volumes.

lbs. composted daily (Step 1) x 20 = primary bin volume, cu ft

__414__lbs./da x 20 = __8280__cu ft primary bin volume

lbs. composted daily (Step 1) x 20 = secondary bin volume, cu ft

__414__lbs./da x 20 = __8280__cu ft secondary bin volume

3. Calculate bin area (use volumes from Step 2).

bin volume, cu ft /depth (usually 5 - 6 ft)
= bin area, sq ft

__8280__cu ft / __6__ft
= __1380__sq ft primary bin

bin volume, cu ft / depth (usually 5-6 ft)
= bin area, sq ft

__8280__cu ft / __6__ft = __1380__sq ft secondary bin

4. Calculate number of bins (at least 3 bins required).

primary bin area (Step 3) / (100-200 sq ft/bin)
= # bins

__1380__sq ft / __170__sq ft/bin
= __8.1__primary bins

secondary bin area (Step 3) / (100-200 sq ft/bin)
= # bins

__1380__sq ft / __170__sq ft/bin = __8.1__secondary bins

5. Calculate bin dimensions.

bin depth = composting depth (usually 5 - 6 ft)
= __6__ft depth

bin width = loader bucket width + 2 ft or wider
= __12__ft width

bin length = bin area (Step 3) / bin width
= __170__sq ft / __12__ft = __14__ft length

6. Calculate annual sawdust requirements.

lbs. composted/yr (Step 1) x 0.0037
= cu yd sawdust/yr

__151,110__lbs./yr x 0.0037
= __559__cu yd sawdust/yr

Example 3. Size a composter for an off-site nursery with a capacity of 8400 pigs. Average weight in the nursery is 27 pounds. Use data in Table 2 to estimate death loss.

Swine Composter Worksheet

1. Calculate weight of carcasses composted. Use data from actual experience, or Table 2.

Sow Herd
sows x avg. wt. x % (Table 2)/100 = lbs. loss/yr

_____ x _____lbs. x _____%/100 = _______lbs./yr

Nursery
pig spaces x avg. wt. x % (Table 2)/100
= lbs. loss/yr

8400 x 27 lbs. x 24 %/100
= 54,432 lbs./yr

Finishing
pig spaces x avg. wt. x % (Table 2)/100
= lbs. loss/yr

_____ x _____lbs. x _____%/100 = ________lbs./yr

Total = 54,432 lbs./yr

lbs. composted daily = (lbs./yr)/365
= 54,432 lbs./yr/365 = 149 lbs./day

2. Calculate primary and secondary bin volume.

lbs. composted daily (Step 1) x 20 = primary bin volume, cu ft

149 lbs./da x 20
= 2980 cu ft primary bin volume

lbs. composted daily (Step 1) x 20
= secondary bin volume, cu ft

149 lbs./da x 20
= 2980 cu ft secondary bin volume

3. Calculate bin area (use volumes from Step 2).

bin volume, cu ft / depth (usually 5 - 6 ft)
= bin area, sq ft

2980 cu ft / 6 ft
= 497 sq ft primary bin

bin volume, cu ft / depth (usually 5 - 6 ft)
= bin area, sq ft

2980 cu ft / 6 ft
= 497 sq ft secondary bin

4. Calculate number of bins (at least 3 bins required).

primary bin area (Step 3) / (100 - 200 sq ft/bin)
= # bins

497 sq ft / 160 sq ft/bin
= 3.1 primary bins

secondary bin area (Step 3) / (100 - 200 sq ft/bin)
= # bins

497 sq ft / 160 sq ft/bin
= 3.1 secondary bins

5. Calculate bin dimensions.

bin depth = composting depth (usually 5 - 6 ft)
= 16 ft depth

bin width = loader bucket width + 2 ft or wider
= 10 ft width

bin length = bin area (Step 3) / bin width
= 160 sq ft / 10 ft = 16 ft length

6. Calculate annual sawdust requirements.

lbs. composted/yr (Step 1) x 0.0037
= cu yd sawdust/yr

54,432 lbs. /yr x 0.0037
= 201 cu yd sawdust/yr

Swine Composter Worksheet

1. Calculate weight of carcasses composted. Use data from actual experience, or use Table 2.

Sow Herd
sows x avg. wt. x % (Table 2)/100 = lbs. loss/yr

_____ x _______lbs. x _____%/100
= _________lbs./yr

Nursery
pig spaces x avg. wt. x % (Table 2)/100
= lbs. loss/yr

_____ x _______lbs. x ______%/100
= __________lbs./yr

Finishing
pig spaces x avg. wt. x % (Table 2)/100
= lbs.s. loss/yr

_____ x _______lbs. x _____%/100
= __________lbs./yr

Total = __________lbs./yr

lbs. composted daily = (lbs./yr)/365

= ________lbs./yr/365 = ___________lbs./day

2. Calculate primary and secondary bin volume.

lbs. composted daily (Step 1) x 20
= primary bin volume, cu ft

___________lbs./da x 20
= ___________cu ft primary bin volume

lbs. composted daily (Step 1) x 20
= secondary bin volume, cu ft

___________lbs./da x 20
= ___________cu ft secondary bin volume

3. Calculate bin area (use volumes from Step 2).

bin volume, cu ft / depth (usually 5 - 6 ft)
= bin area, sq ft

________cu ft / _______ft
= _________sq ft primary bin

bin volume, cu ft / depth (usually 5-6 ft)
= bin area, sq ft
________cu ft / ______ft
= _________sq ft secondary bin

4. Calculate number of bins (at least 3 bins required).

primary bin area (Step 3) / (100 - 200 sq ft/bin)
= # bins

_________sq ft / __________sq ft/bin
= ________primary bins

secondary bin area (Step 3) / (100 - 200 sq ft/bin)
= # bins

_________sq ft / __________sq ft/bin
= ________secondary bins

5. Calculate bin dimensions.

bin depth = composting depth (usually 5 - 6 ft)
= ____________ft depth

bin width = loader bucket width + 2 ft or wider
= ____________ft width

bin length = bin area (Step 3) / bin width

= ________sq ft / ________ft = ________ft length

6. Calculate annual sawdust requirements.

lbs. composted/yr (Step 1) x 0.0037
= cu yd sawdust/yr

_________lbs./yr x 0.0037
= _________cu yd sawdust/yr

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