

Composting Daily Mortalities



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Methods For Disposal Of Daily Mortality

- Incineration
- Burial pit
- Rendering
- Acid Fermentation
- NaOH Digestion
- Alligators
- Composting



Not Acceptable



Why Composting is a Good Choice

- Biosecure
 - No entry of off-farm vehicles
 - Allows for immediate year-round disposal of carcasses
 - High compost temperatures kill pathogens, insect pests

National Veterinary Services Laboratory, Ames, Iowa
 – Avian influenza virus not recovered after 10 days of composting

Why Composting is a Good Choice

- Environmentally sound
 - Properly functioning composter gives off little odor, does not attract pests or contaminate groundwater
 - Turns waste into beneficial fertilizer and soil amendment
 - On-farm nutrient recycling

Why Composting is a Good Choice

- Cost effective
 - Low to moderate start up costs
 - Minimal operating costs

Comparison of Standard Disposal Methods

	Composter (10+ year life)	Incinerator (3-5 year life)	Burial Pit (5 year life)*
Initial Costs	\$5,280 (3755 – 7825)	\$1,350 (1000 – 1700)	\$2,000 (1500 – 2500)
Annualized Initial Costs	\$352	\$225	\$400
Operating Costs	\$2.25 / 100 lbs.	\$3.50 / 100 lbs.	None
Maintenance Costs/Year	\$53.00	\$135.00	Minimal

Why Composting is a Good Choice

- Easy to accomplish
 - Requires only good management
 - Utilizes readily available organic materials typically found on farm

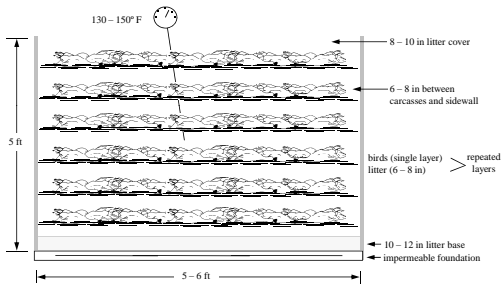


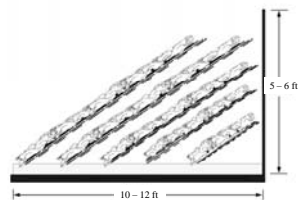


Necessities for all-weather operation of composter

- ❑ Roof to control rainwater and percolation of runoff water
- ❑ Weight-bearing, impervious base (concrete preferred)
- ❑ Pressure-treated or rot-resistant materials that will resist the biological activity of composting
- ❑ Water and electricity availability

Mortality Composter Profile





Key Elements for Successful Composting

- ❑ Moisture
- ❑ Carbon:Nitrogen Ratio
- ❑ Aeration
- ❑ Temperature

Moisture

- ❑ 40-60 % is our target
- ❑ Moisture necessary for microbial activity
- ❑ Biological activity greatest when materials are uniformly saturated
- ❑ Compost after 2 heat cycles should have a moisture content similar to moist chewing tobacco



Carbon:Nitrogen Ratio

- ❑ 20-30:1 best for balanced diet for biological organisms
- ❑ Unbalanced ratio results in poor compost
 - excess ammonia release
 - uneven product



Aeration

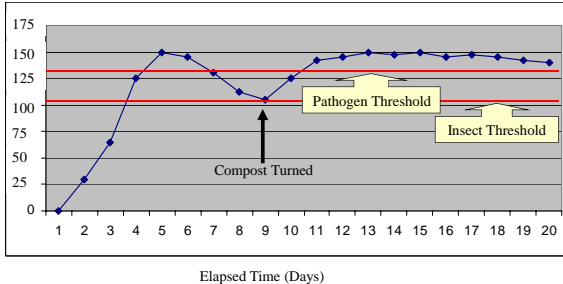
- ❑ 14-17 % oxygen (hard to measure)
- ❑ Large amounts of oxygen consumed especially during the early stages (first 7 days)
- ❑ Additional infusion of oxygen is needed to continue/complete the composting process

Temperature

- ❑ 130 to 150°F
- ❑ Indicator of microbial activity
- ❑ Temperatures above 130°F needed for destruction of pathogens, fly larvae and other insect pests



Typical Temperature Profile in a Two Stage Composter



At first turn...>90% reduction



Doing things right

- Compost will go through a heat cycle each time it is aerated
- Few insects will be present when the material is actively composting
- A well-designed and well-managed composter will not contribute to either the number or species of flies already present in the area
- Two-stage composting effectively inactivates avian and human pathogenic organisms, weed seeds, insect larvae

Indicators that a Composter is not working well

- Failure to heat to a core temperature of 130°F
- Production of considerable odor
- Discharge of dark colored liquid around the base
- Presence of large numbers of larvae and flies on and around the bins
- Presence of whole or partially decomposed carcasses when "completed" bins are opened



Troubleshooting Guide


Problem	Probable Causes	Solutions
Improper Temperature	Too dry Too wet Improper C:N Ratio Improper mixing of ingredients Adverse weather	Add water Add bulking material and turn pile Evaluate bulking material and adjust as necessary Layer ingredients appropriately Ensure adequate cover, water barriers
Failure to Decompose	Improper C:N Ratio Carcasses layered too thick Carcasses on outside edges	Evaluate bulking material and adjust as necessary Single layer the carcasses Maintain 6 - 8 inches between carcasses and walls
Odor	Too wet Too low C:N Ratio Low oxygen Inadequate cover over carcasses	Add bulking material and turn pile Evaluate bulking material and adjust as necessary Turn pile Cover with 8 -10 inches of bulk material

Troubleshooting Guide

Problem	Probable Causes	Solutions
Flies	Inadequate cover over carcasses Poor sanitation conditions Too wet Failure to reach proper temperature	Maintain 8 - 10 inches cover Avoid leaching from pile, standing water, trash accumulation Add bulking material and turn pile Assess C:N ratio, ingredient layering
Scavenging Animals	Inadequate cover over carcasses	Maintain 8 -10 inches cover Avoid initial entry with fence or barrier

Composting Checklist Summary

- Load mortality as a single layer
- Keep carcasses at least 6 inches from sidewalls
- Monitor temperatures regularly
- Properly turn and aerate material to keep process aerobic
- Keep carcasses covered with dry litter at all times to minimize odors, discourage scavengers and flies
- Add water carefully



In the end...

- Resulting compost has chemical and physical properties similar to poultry litter
 - Not recommended for application on home gardens
- Releases N at slower rate and over longer period of time
- Composting is a viable component of nutrient management planning

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