Mortality Composting

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Carcass Disposal Options

Render – best option, where available but rules and regulations have made this more difficult resulting in insufficient capacity

Compost – uses resources found on-farm, cost effective, minimizes farm and public exposure, can be done on-site

Alkaline digestion – environmentally friendly, expensive, insufficient capacity

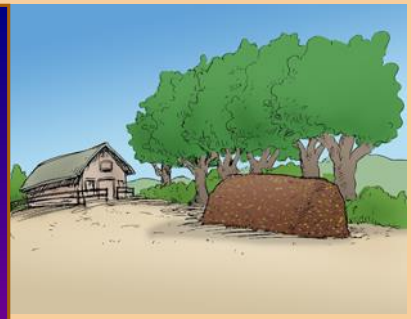
Burial – 6' closer to water table, no leachate control

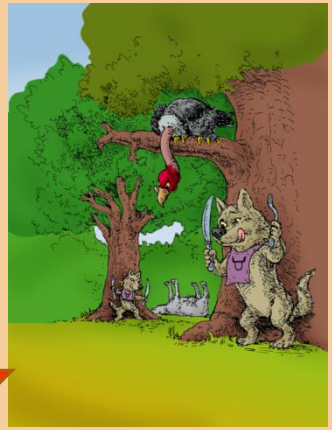
Incineration – costly, inefficient, air pollution

Landfill – expensive, insufficient capacity, worker trepidation, may not be available

Carcass left outside for scavengers to decay – disease transmission risk, illegal

Low Risk





High Risk

Goals of Carcass Disposal

FULFILLS REGULATIONS

CREATES POSITIVE PUBLIC PERCEPTION

REDUCES DISEASE TRANSMISSION

PROMOTES ENVIRONMENTAL SUSTAINABILITY

PRODUCES BENEFICIAL BY-PRODUCT

ECONOMICAL

PRACTICAL

Why Should Farms Compost?

Pathogen kill in thermophilic composts

Can be done with equipment available on most farms

Odor reduction

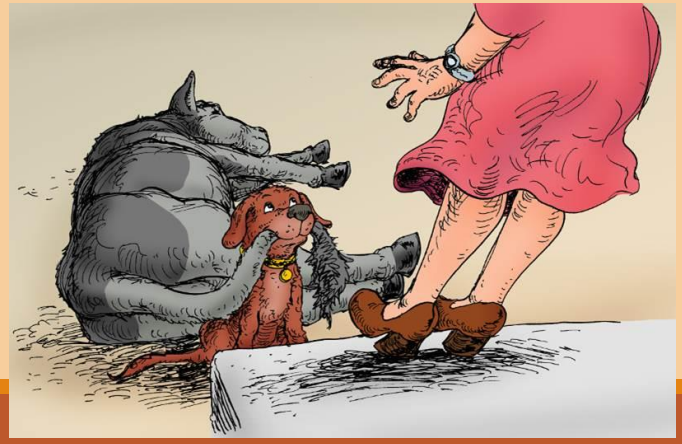
All sizes of animals can be composted

Relatively low labor and management needed

Placental membranes and other tissue can be composted

Doesn't cost a lot of money

Neighbor relations



What is composting?

It is the aerobic, or oxygen requiring, decomposition of organic materials by microorganisms under controlled conditions

Composting reduces both the volume and mass of the raw materials while transforming them into a valuable soil conditioner

The Composting Process

Microorganisms consume oxygen while feeding on organic matter and as a result, give off heat.

Composting Process Variables:

- Micro- and macro-organisms
- Diet
- Air
- Moisture
- Shelter

By managing these factors you can speed up the otherwise slow natural decay process

Aerobic composting and temperature

Active composting occurs in the temperature range of 90°F to 160°F

Pile temperature may increase above 160°F but this is too hot for most bacteria and decomposition will slow until temperature decreases again.

Remember, Compost pile heat is the direct result of microbial metabolism!!!

The Composting Process
Diet

Nitrogen comes from the wet material. Organisms use this as a source of protein to grown and reproduce.

Carbon comes from the dry material. organisms use this as a source of energy

The Composting Process
Diet

What is C:N Ratio?

Supply of total carbon compared to total nitrogen in compost feedstock

If C:N is too high the compost process will slow

If C:N is too low, more likely to lose Nitrogen as ammonia gas or in leachate

Ideal initial C:N mixture range is 20 – 30:1.

The Composting Process
Air, Moisture and Shelter

FEEDSTOCKS

MANAGEMENT

METHOD

What Happens in Mortality Composting?

Nitrogen

The Diet is all wrong (C:N about 80:1)

Air flow occurs passively

Moisture comes from the carcass as it decomposes

Carbon

What Happens in Mortality Composting?

Mortality composting does not follow the rules of starting with a “mix” with the right moisture and C:N ratio. Instead, the envelope of carbon material simply allows the natural process of decomposition to occur in a manner that will absorb the moisture and odors emitted when carcasses decay.

Composting Methods

Static Pile – Passively Aerated OR Turned Windrow

In-Vessel – buildings, bags, cylinders

Carcass Composting Steps

- Select Site

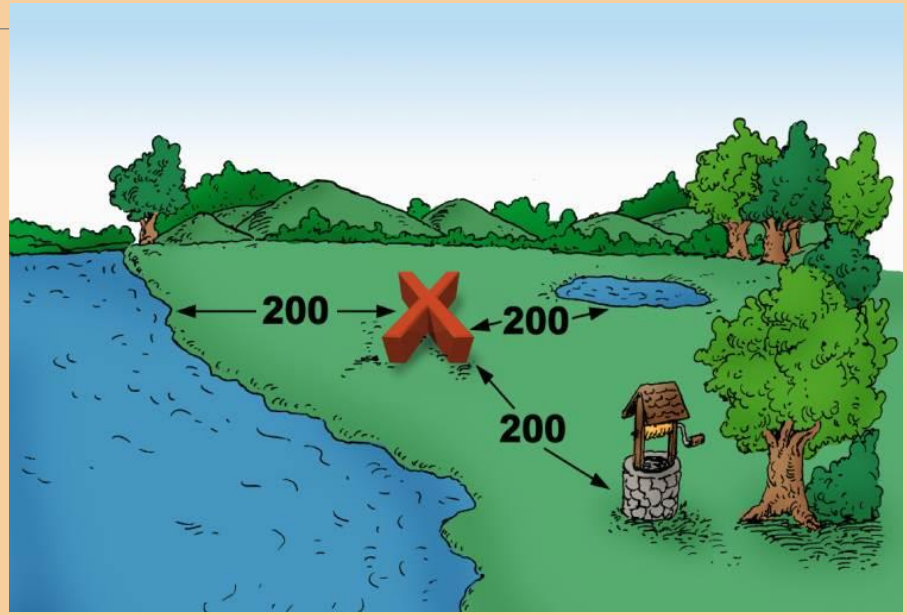
- Prepare base

- Place animal and cover
- Layer young and/or small animals

- Let sit 4 to 6 months
- Use the composted material
- Reuse bones/un-composted material

Carcass Composting Steps
1 Select a site

- Water
- Air
- Slope, soil conditions
- High and dry
- Amount and storage of feedstock
- Access to work on pile
- Population density



Make sure you are not close to wells, streams, water bodies. Check depth to groundwater. Look for plants that indicate wet areas.

Carcass Composting Steps

2 Prepare a Base

Lay 24-in bed of bulky, absorbing organic material containing some sizeable pieces, preferably woodchips

Carbon/Feedstocks

Not all carbon sources are created equal

Carbon/Feedstocks

Fine Carbon

Coarse Carbon

Mixed Carbon

Very Coarse Carbon

Carbon/Feedstock Characteristics

Potential Farm Feedstocks for Cover*

ANIMAL BEDDING
WASTE FEED
MANURE
STRAW
SPENT FEED

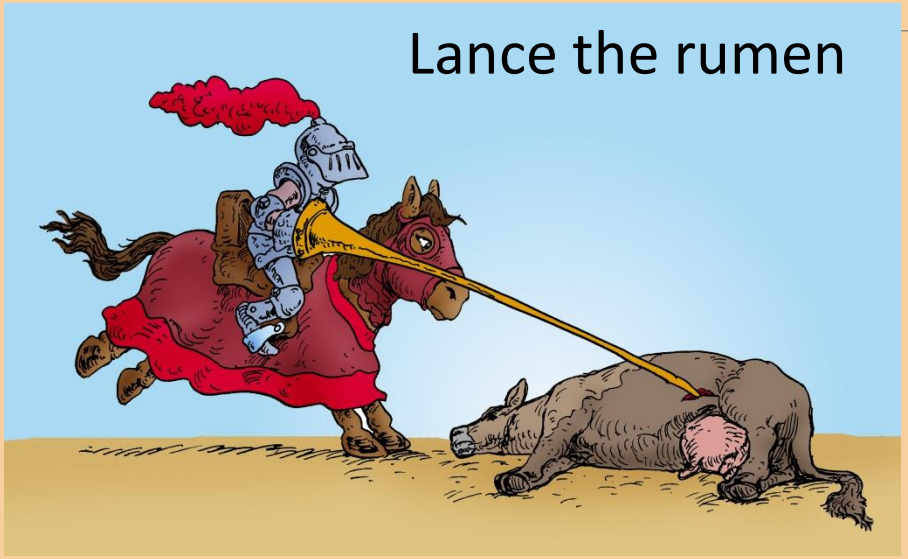
*Base material should be chunky (i.e. woodchips)

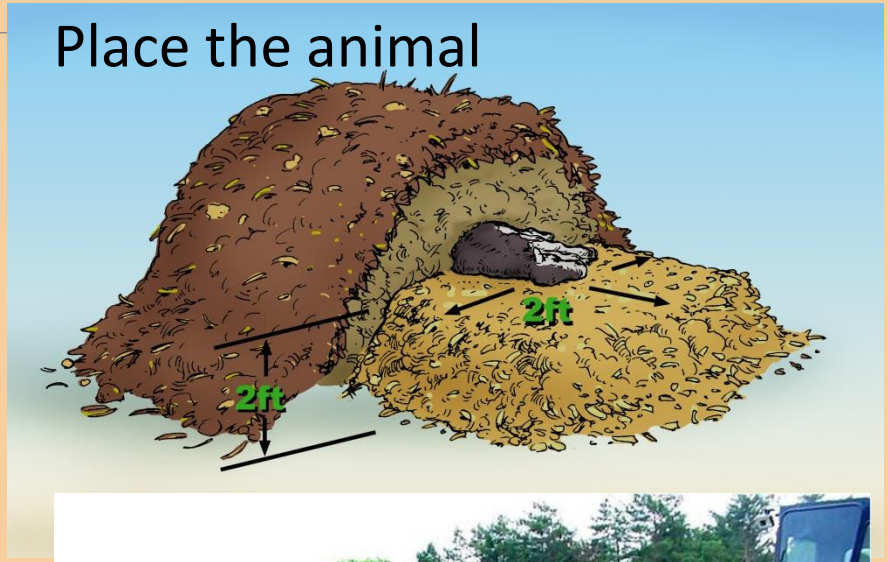
Carbon Sources

Contact List for Sources of Carbon and Bulking Materials

Entity	Information
Tree Service Company (such as Asplundh)	Contact: _____ Phone: _____ Fax: _____ E-Mail: _____
Local (Town/Village) Highway Department	
County Highway Department	
State Highway Department	
Utility Company (Telephone, Electric, Cable)	
Landscapers	
Logging Companies	
Arborists	
Sawmill/Lumber yard (non-pressure treated only)	
Local Parks Department	

Carcass Composting Steps
3 Place Animal and Cover





Cover with dry, high-carbon material

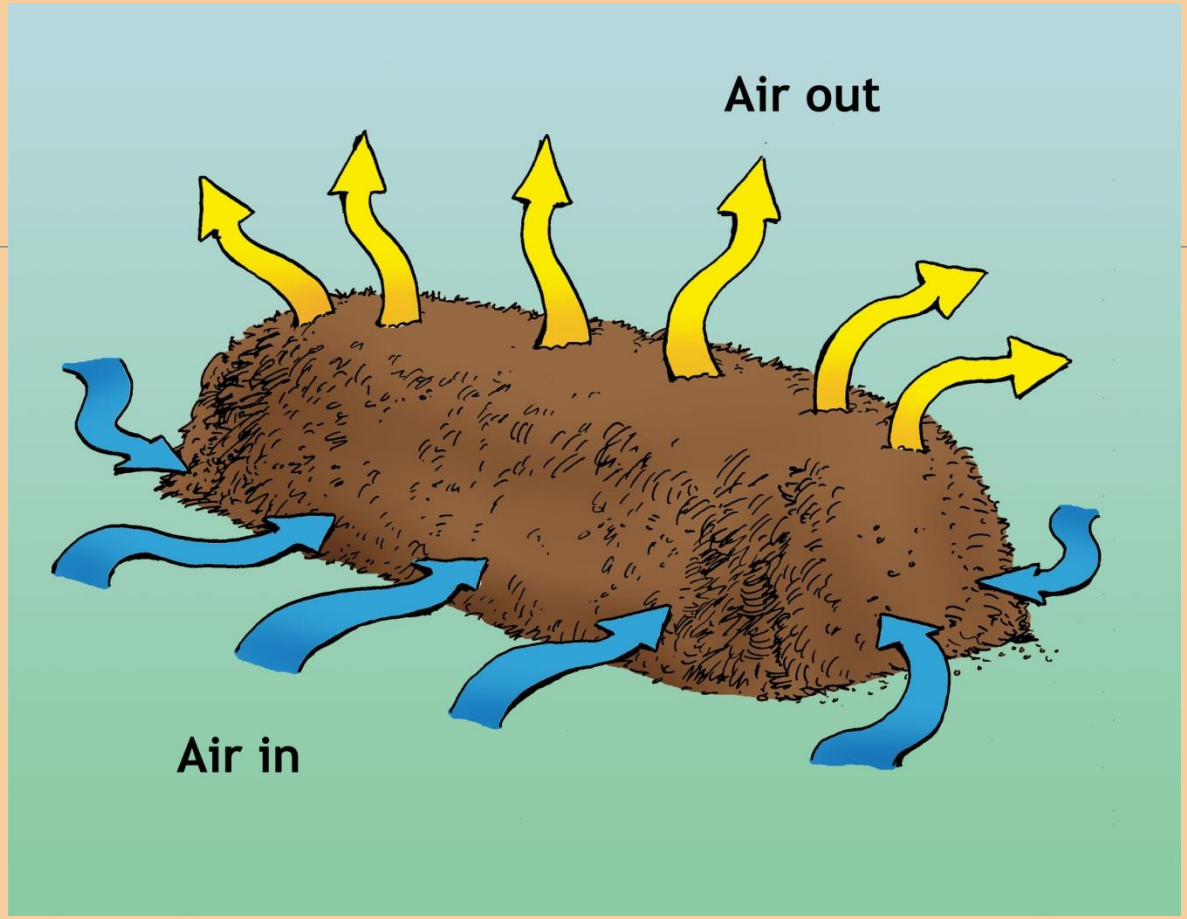
Carcass Composting Steps
Layer young or small animals

Base Layer (24” woodchips/carbon)

Cover the layer with 12” carbon

Two feet of carbon all the way around the birds. Additional base material at the end to extend the windrow

2-3 layers depending on the height. Cover with a 2-foot cap of carbon



Thermal air movement and diffusion in a well-built passively aerated static pile

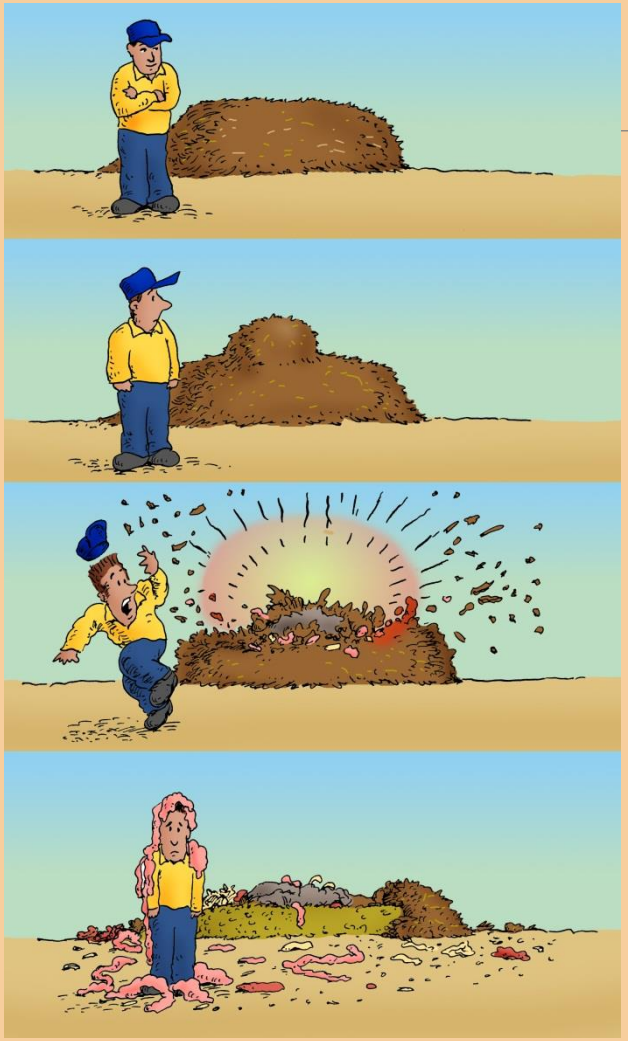
Some Best Management Practices

Incorporate dead stock in a timely fashion

Some Best Management Practices

Keep piles/windrows about 10-16 feet wide and 5-8 feet tall. Large, poorly shaped piles restrict air flow and are not efficient

Troubleshooting



Not enough cover

Forgetting to lance the rumen

Avoid driving on the pile/base

Carcass Composting Steps

4 Let sit 4 – 6 months

Well stacked piles should heat up in 12 – 24 hours

Month 1 – Cooked Meat

Month 2 – Meat is Digested

Month 3-4 – Clean Bones

5 Use the Composted Material

Reuse Bones and
Un-composted Material

Research on Mortality Composting

- Pathogens are deactivated via high temperatures, microbial degradation, pH and other factors
- Using a static pile method reduces the volume of leachate and soil filtration reduces concentrations of contaminants, limiting the risk of groundwater contamination.
- When managed properly, composting will deter domestic and wild animals from scavenging on treated carcasses while they contain the highest drug concentrations providing an effective means of disposal of euthanized livestock.
- On-farm composting reduces the potential for farm-to-farm disease transmission with the benefit of a usable product

CWMI Resources

http://cwmi.css.cornell.edu/mortality.htm

Questions?

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