

Composting Poultry Manure and Mortalities

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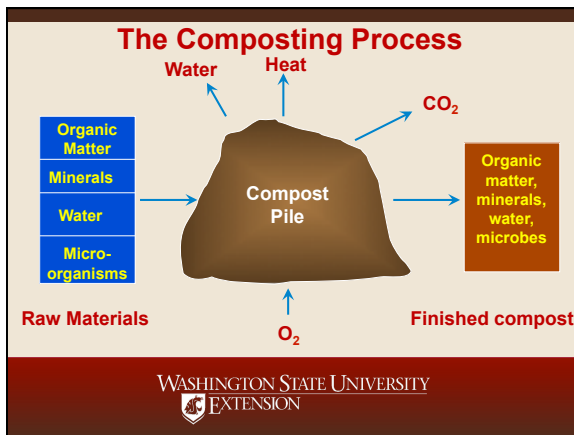
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Composting

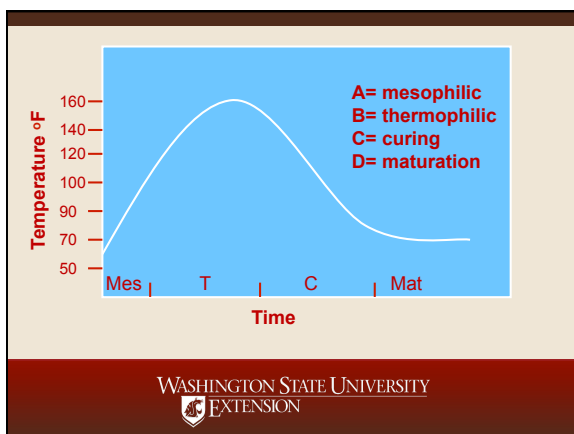
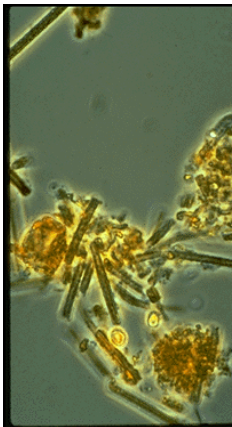
Decomposition of organic materials by aerobic microorganisms under controlled conditions

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	Reasonable ranges	Preferred ranges
C:N ratio	20-40:1	25-30:1
H₂O content	40-65%	50-60%
O₂	>5%	>5%
Particle size	1/8-1/2in.	varies
pH	5.5-6.5	6.5-8.0
Temperature	110-150F	130-140F

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Phases of Aerobic Composting

Mesophilic phase: moderate temps, lasts for a few days

Thermophilic phase, high temps. Lasts from a few days to several weeks

Curing and maturation phase, moderate to ambient temps. Lasts 1-2 months.

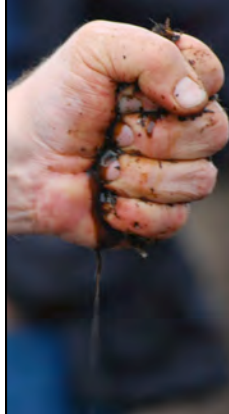
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	C:N Ratio
Compost	15-25:1
Grass clippings	15:1
Laying Hens	6:1
Food wastes	15:1
Dairy manure	20:1
Broiler litter	15:1
Straw	80:1
Bark	115:1
Paper	170:1
Wood or sawdust	500:1



C:N Ratio

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Moisture

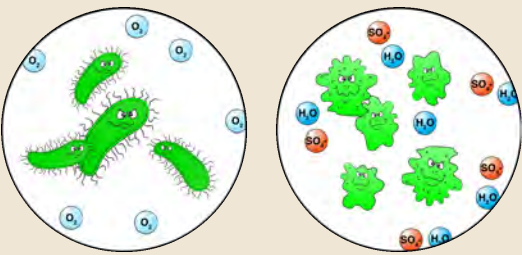
- To dry microbes can't move round and break down organic matter
- Too wet not enough O₂ for aerobic microbes and produce foul odors

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Oxygen Management

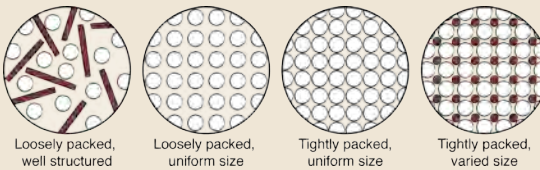
The Biochemistry of Microbial Breathing

Aerobic & Anaerobic respiration



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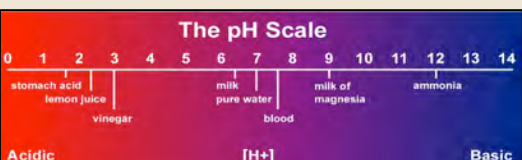
Effects of Particle Size and Porosity on Aeration



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pH: Measure of Acidity or Alkalinity

- Bacterial decomposers prefer pH 6.0 to 7.5.
- Fungal decomposers prefer pH 5.5 to 8.0.
- Ideal range is 5.8 to 7.2.
- pH exceeding 7.5 can promote ammonia gas loss.




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Pathogen Reduction (PFRP)

Turned pile composting
At least 15 days above 131°F with 5 turns


Aerated Static piles or in vessel composting
At least 3 days above 131°F



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Pathogen Destruction

- Heat
- UV light
- Desiccation
- Competition
- Toxicity




Which of these are at work during composting?

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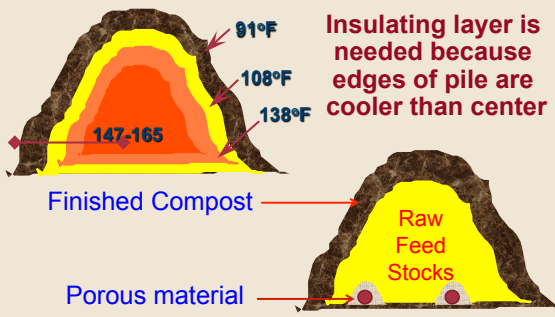
Aerated Static Pile Composting

Maintains aerobic conditions
Controls objectionable odors
Manage pile temperatures

- Expedite active composting & curing
- Produce superior compost products
- Changes PFRP times
- Bigger piles
- Moisture needs to be right from the get go
- Potential for over aerating (heat and moisture loss)
- Disposable materials



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Insulating layer is needed because edges of pile are cooler than center

Finished Compost

Porous material


Raw Feed Stocks

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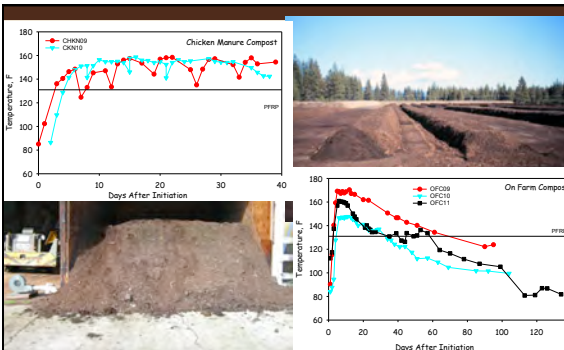
Turned Windrow Composting

Controls objectionable odors
Manage pile temperatures

- Expedite active composting & curing
- Changes PFRP times
- Smaller piles
- Easier to add water
- Bigger composting foot print required
- No electricity required



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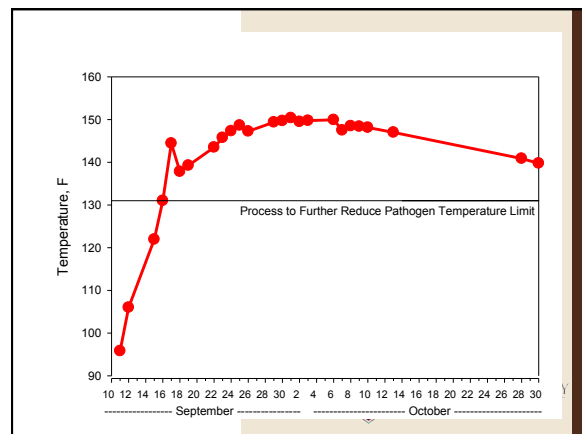
Temperature, F

Days After Initiation

Chicken Manure Compost

On Farm Compost

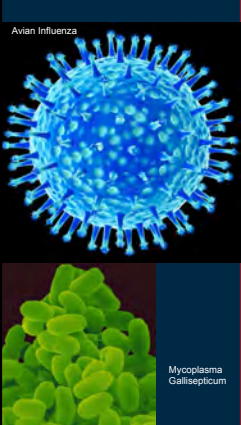
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Mortality, Offal Composting

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Diseases Controlled by Heat

- IB Bronchitis
- NC New Castle
- MG Mycoplasma Gallisepticum
- IBDV Infectious Bursal Disease Virus
- AI Avian Influenza

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Composting Mortalities

- Select a well drained site
- Determine your compost recipe
- Build the sandwich
- Make sure all carcasses are covered
- Monitor temperature
- Compost at least 3-4 weeks
- Deal with dropped manure and feathers

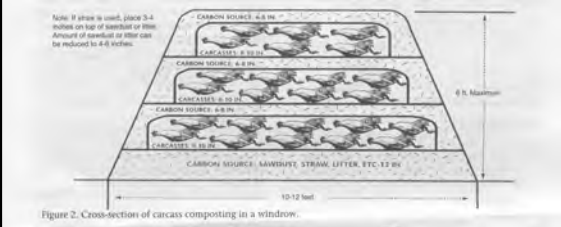


Figure 2. Cross-section of carcass composting in a windrow.


Build the sandwich
Use adequate carbon source wood shavings, bedding, straw



Composting Mortalities

- ❖ Make sure you have adequate
- ❖ Carbon source
- ❖ Equipment
- ❖ Personnel
- ❖ Supplies

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Happy Composting

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