What is Composting?
• Composting is defined as the natural decomposition of organic materials by aerobic bacteria and fungi

• Heating
  – High oxygen consumption
  – Thermophilic (>55°C)
  – Rapid reduction in biodegradable solids

• Curing or Maturation
  – Aeration less of a factor
  – Slower reactions
  – Digestion of lignins

• Pile generally turned
  – Temperature drop
• **Optimal composting**
  – Carbon to nitrogen ratio (C:N): 20:1 to 35:1,
  – Moisture content: 50 to 60%
  – Porosity: 35 to 45%
  – Oxygen: 10% volume

• **Excessive moisture levels (65% or greater)**
  – Limits oxygen
  – Increased odor

• **Low moisture**
  – Decreased activity
• A variety of supplemental carbon materials have been successfully used to compost animal carcasses
  – Hardwood sawdust
  – Woodchips
  – Built up litter
  – Straw
  – Corn stalks
  – Peanut hulls

• Poultry Litter and feedlot manure
  – Lower C:N ratios
  – Need to be blended

(Kalbasi et al., 2005; Bendfeldt et al., 2006; DeRouchey et al., 2005)
• Viral inactivation
  – Influenced by time AND temperature
• Avian Influenza Virus
  – Not detected after 5 sec @ 70º C
  – Not detected after 30 min @ 60º C
  – Not detected after 60 min @ 56º C
  – Reduction in titer at 60º C
• Composting provides heat for long duration
• HPAIV inactivated after 10 days of carcass composting
  (King, 1991; Swayne, 2006; Senne et al., 1994)
• Composting has been shown to control
  – Pathogenic viruses
  – Bacteria
  – Fungi
  – Protozoa

• Composting does not reach the temperature required to inactivate certain bacteria or prions.

• “Bio-heat treatment”
  – Term suggested by CFIA
  – Catastrophic carcass composting
  – Composting produces heat, ammonia and other products that can kill virus
• Reduces potential groundwater pollution from burial
• Avoids high fuel costs and potential air pollution from incineration
• Reduces potential disease spread associated with removal of litter and carcasses from the house
• Eliminates transport to landfills or other disposal sites and the associated costs and fees
• Adaptable to most climates & poultry operations
• Used for broilers, layers, turkeys, swine, sheep and cattle
• Low cost, uses farm resources
• *Proper* composting is biosecure & environmentally friendly
• Recycles nutrients into safe, non-offensive products
• Difficult in pole houses
• May not be an option for cages
• Finding appropriate Litter/carbon sources
• Questionable acceptance internationally
  – EU
• Relatively slow process
  – Ties up house until windrow removed
  – Windrow removed at 14 – 21 days

• Requires knowledge, experience and confidence in the procedure