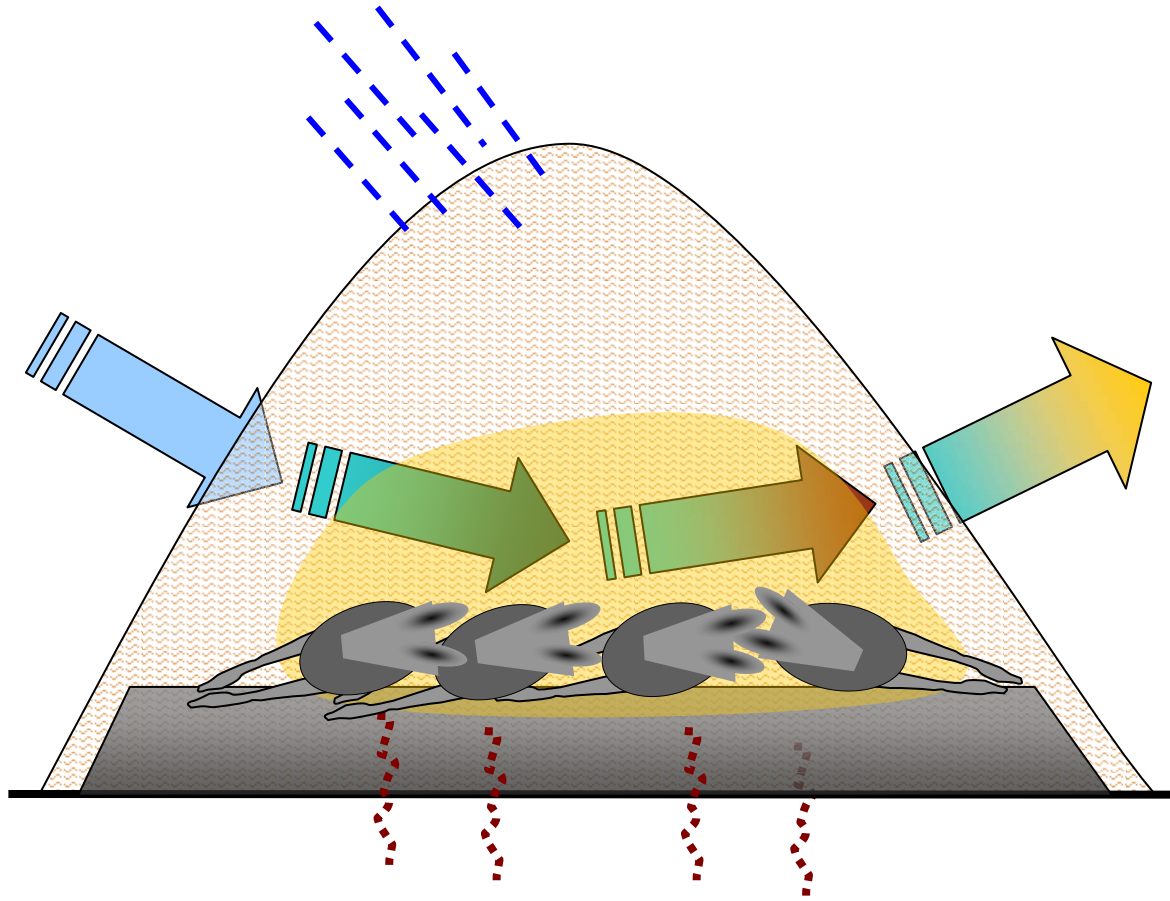
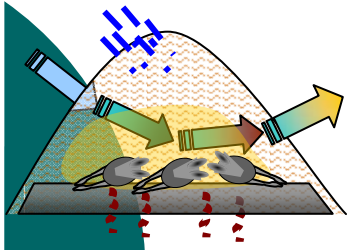


Understanding & Troubleshooting Mortality Composting



Benefits of Swine Mortality Composting



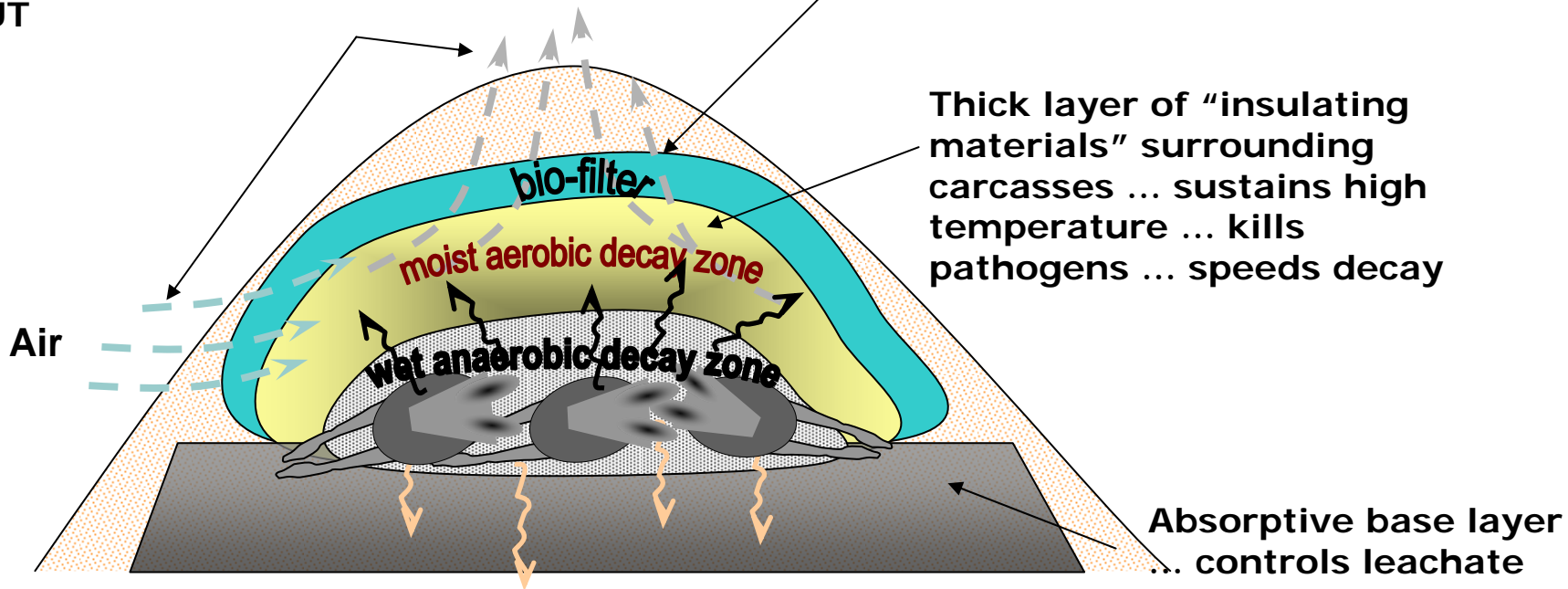
- Low capital & operating costs
- Simplicity & reliability... no need for special equipment or materials
- Biosecurity & environmental protection
- Easy to construct or expand in emergencies

4 Keys to Successful Composting

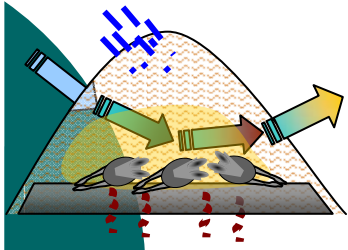
Permeable cover material ... lets oxygen IN, excess water vapor OUT

Moist bio-filter zone ... adsorbs & degrades odorous byproducts

Thick layer of "insulating materials" surrounding carcasses ... sustains high temperature ... kills pathogens ... speeds decay

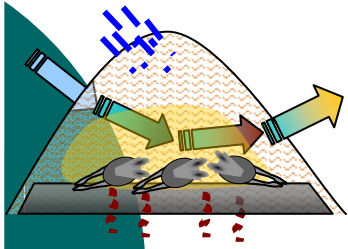


Absorptive base layer ... controls leachate



Troubleshooting Mortality Composting Problems

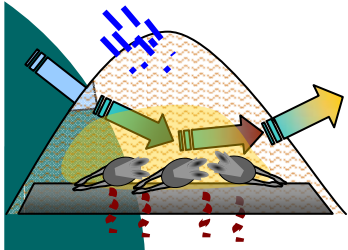
- Most Common Problems
 - Leachate production
 - Poor odor retention
 - Slow carcass decay



Troubleshooting - Leachate

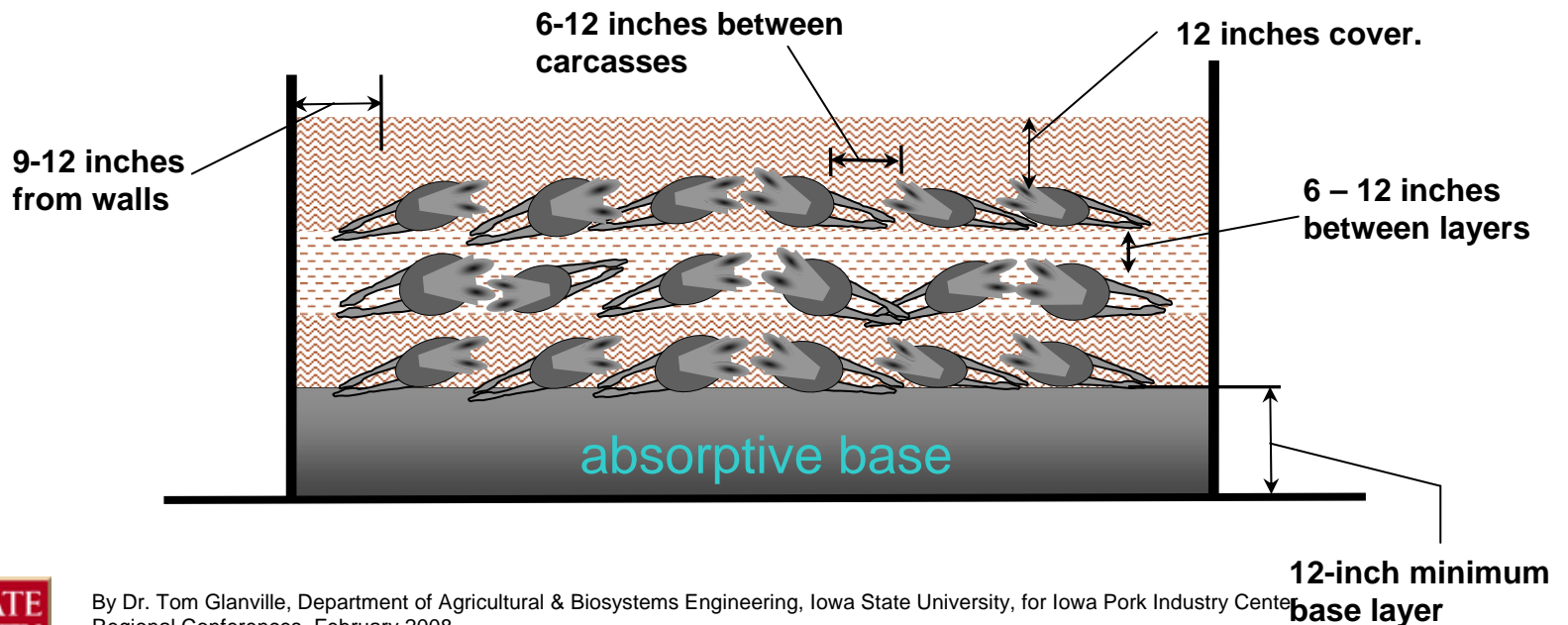
- Cause #1: Excessive precipitation exposure during wet seasons
 - Solution: Reduce exposure
 - Roofed bin system; or
 - Install tarp over piles

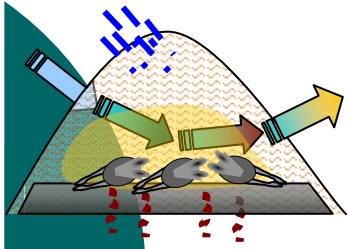




Troubleshooting - Leachate

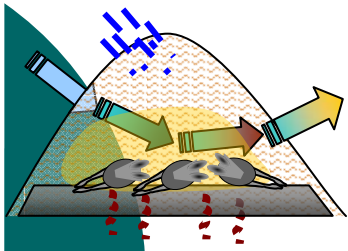
- Cause #2: Inadequate liquid absorption capacity
 - Solution: Use thicker envelope of absorptive material under, between, & over carcasses





Troubleshooting - Leachate

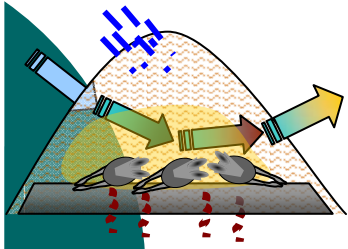
- Cause #3 : Overloading ... too many carcasses in one spot
 - Remember ... every 1000 lbs of carcasses contains 650 lbs WATER !
- Solution:
 - Carcasses should not touch each other (no room for absorptive material)
 - Avoid stacking of large carcasses (> 400 lbs)



Troubleshooting - Leachate

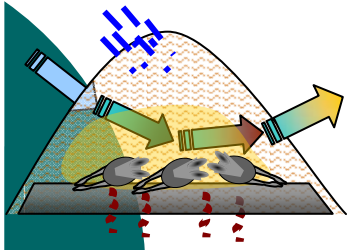
- Cause #4: Use of envelope material that is too wet
 - Solution:
 - Use “squeeze” test to check moisture
 - Material should feel moist ... but yield only a few drops of water when squeezed (not saturated)
 - Store envelope material in dry location to avoid excessive moisture





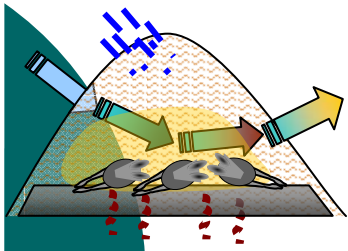
Troubleshooting – Poor Odor Retention

- Cause # 1: Envelope material placed over carcasses too thin ... or too coarse
 - Solution:
 - Use at least 12 inches of envelope material over carcasses
 - Avoid use of extremely coarse envelope materials
 - Must grind coarse materials such as cornstalks or straw (use 2-inch screen)



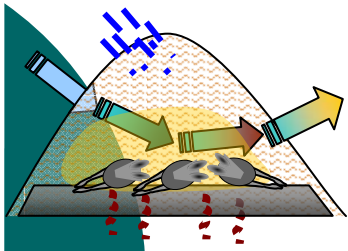
Troubleshooting – Poor Odor Retention

- Cause # 2: Compost turned prematurely
 - Solution:
 - Don't turn compost too soon
 - "Too soon" varies with carcass size & seasonal temperatures
 - A few days for small pigs during warm weather
 - 8-12 weeks for large pigs during cold weather
 - Experience the best teacher
 - Stockpile extra envelope material ... be prepared to cap pile with more material if needed to suppress odor emissions



Troubleshooting – Poor Odor Retention

- Cause # 3: Compost too wet
 - Prevents oxygen penetration ... pile goes anaerobic ... produces excessive odor
 - Often accompanied by leachate release
- Solutions: Same as for leachate ... easier to prevent than to fix after odor starts
 - Reduce exposure to excessive rainfall
 - Avoid overloading pile
 - Mix wet compost with drier cover materials
 - CAUTION ... likely to increase odor releases during mixing re-cap with thick layer of material to retain odor



Troubleshooting – Slow Decay

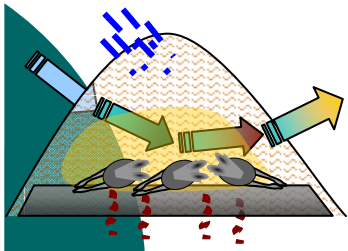
- Cause # 1: Inadequate O₂ penetration caused by fine textured cover material
 - Solution: Use coarser cover material
 - Particles with 1/8th inch minimum dimension ... obvious pore spaces between particles (below right)
 - Avoid “soil-like” materials comprised of small particles with tiny pore spaces (below left)



poor texture

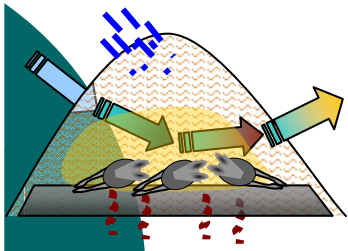


better texture



Troubleshooting – Slow Decay

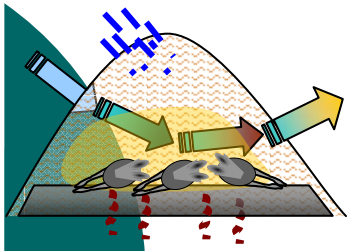
- Cause # 2: Inadequate O₂
 - Caused by excessive moisture
 - Often accompanied by leachate
 - Solution: Again ... similar to those for leachate
 - Reduce exposure to excessive rainfall
 - Avoid overloading pile with too many carcasses and too little absorptive material
 - Mix wet compost with coarser and drier cover materials
 - Time consuming, may not work if compost is too sticky to mix



Troubleshooting – Slow Decay

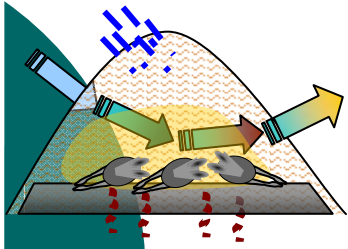
- Causes # 3 : Inadequate moisture
 - Typically occurs only during very dry weather

 - Solution:
 - Add water sparingly and turn (to mix)
 - May need to repeat several times
 - Proceed slowly ... very easy to over wet small sections resulting in odor and leachate



Troubleshooting – Slow Decay

- Causes # 4 : Low temperature caused by inadequate heat production or retention
 - Solution:
 - IF material near carcasses is moist ... increase thickness of envelope material to improve heat retention
 - If material near carcasses is dry... add moisture to improve microbial activity & heat production
 - Note: do not put frozen carcasses into a composting system ... takes extremely long time for carcasses to thaw and produce heat



For More Information

- *Composting Swine Mortalities in Iowa* (ISU Extension Publication Pm-1917)
- ISU swine mortality composting web site
 - www.abe.iastate.edu/pigsgone/