Scientific Basis For Composting
• Composting of catastrophic poultry mortalities
  – Non-infectious conditions like heat stress.
• Composting of huge quantities of poultry carcasses
  – Outside the poultry house
  – Creating windrows instead of placing the carcasses in traditional composting bins

(MD Coop. Extension Fact Sheet, Murphy, 1992; Malone, et.al. 2003, 2004; Bendfeldt, et.al. 2005; Bendfeldt et al., 2006; DeRouchey et al., 2005)
• Large-scale windrow composting inside poultry houses has been evaluated and documented
• Use of composting to dispose of mortality shown for other species
  – Sheep, Swine, Bovine
• Experiment 1
  *Impact of foam on composting*

• Experiment 2
  *Sampling methods*

• Experiment 3
  *Techniques for Eastern Europe*

• Experiment 4
  *Bulking Agents*

• Experiment 5
  *Compost Enhancers*
• To determine if culling foam impacts windrow composting temperatures
• 2,500 seven-week old broilers / in-house windrow
• Windrow Treatment 1 (T1)
  – Kifco Foam Generator
  – 1% Chemguard foam conc.
• Windrow Treatment 2 (T2)
  – Spumifer Nozzle
  – 1% Phos-Check foam
• Windrow Treatment 3 (T3) Control
  – Processing Plant DOAs, No foam
Experiment 1 Windrow Preparation
Experiment 1

Windrow Preparation
Experiment 1 Results
• To examine the impact of freezing of composted tissue samples on virus recovery and to monitor composting windrow temperatures

• 700 seven-week old broilers = in-house windrow

• Four virus samples collected per day on Days 0, 1, 2, 3 & 7

• Two samples processed immediately for virus recovery

• Two samples frozen and processed for virus recovery
Virus Sample Preparations
Experiment 2 Windrow Preparation
Experiment 2 Results

- More virus was recovered from frozen than fresh samples
- More virus was recovered from breast meat than trachea
- No virus recovered past Day 2 of composting
Experiment 2 Results
• Conducted to evaluate litter materials typical in Eastern Europe
  – Evaluate impact of litter
  – Composting windrow temperature
  – Virus recovery
• ~350 (7-week old) broilers (1000 kg) / windrow
• Windrow Treatment 1 (T1)
  – 100% Sawdust litter
• Windrow Treatment 2 (T2)
  – 50% Sawdust / 50% Straw litter
• Windrow Treatment 3 (T3) Control
  – 100% Straw litter
Experiment 3 Windrow Preparation
Experiment 3 Windrow Preparation

Base layer formation

Raw materials: DOAs, premixes, litter
Experiment 3 Windrow Preparation
• Carcass cooked and degraded within 4 weeks
  – Approximately 95%+ degradation
Experiment 3 Results
Experiment 3 Results

Compost Temperatures

Temperature (°C) vs Day

- T1
- T2
- T3
• Evaluate potential bulking agents
  – Composting windrow temperature
  – Virus recovery
• 1400 processor plant DOA’s, 4 treatments
• Windrow Treatment 1 (T1) Control
  – Sawdust litter
• Windrow Treatment 2 (T2)
  – Wood chips
• Windrow Treatment 3 (T3)
  – Mulch
• Windrow Treatment 4 (T4)
  – Processed active compost
Experiment 4 Windrow Preparation
Experiment 4 Windrow Preparation

- Litter
- Wood chips
- Sawdust
- Active Compost
Percent of Positive HA from Tube Samples

Experiment 4 Results - Tubes
Percent of Positive HAs from Breast Tissue Samples

Experiment 4 Results - Breast
Experiment 4 Results

Disposal: Science and Theory
• Active compost is an ideal bulking agent
  – Microbial levels ideal
  – Fast temperature rise early in response
  – Early temperature rise more important for virus inactivation than extended temperatures

• Wood chips slow to generate sustained temperature
  – Reduced inactivation
  – Higher long term temperatures
• Can any commercial additives improve the process?
  – *Many claims, little evidence*
• ~700 (7-week old) broilers / windrow
• Treatments
  – Control
  – Nutrient based (*EviroCE*)
  – Microbial (*CF4*)
Experiment 5 Windrow Preparation
Experiment 5 Windrow Rotation
Experiment 5 Results - Tubes

All virus inactivated by Day 2

Control treatment also quickly inactivated

Little difference between treatments
Disposal: Science and Theory

Experiment 5 Results - Breast

- All virus inactivated by Day 3
- Control treatments showed faster inactivation than treatments
Experiment 5 Results

- Temperatures sufficient for all treatments
- No difference between treatment and control

![Graph showing temperature changes over days for Bacteria, Control, and Nutrient treatments.](image-url)