

Avian Influenza Disposal Issues and Past Experience

Gary A. Flory

gflory@deq.virginia.gov

Agricultural & Water Quality Assessments Manager
Virginia Department of Environmental Quality

U.S. Environmental Protection Agency, Region 3

2006 NPDES States Meeting

Ocean City, Maryland

May 16 - 18, 2006



Avian Influenza Outbreaks in 1984 and 2002

1984

- ◆ Primary means of disposal was on-site burial
 - 88% or 5700 tons of carcass
 - 12% or 665 tons disposed of in local landfill
- ◆ Cost of disposal was \$142,000 and total cost was \$40 million to the industry

Concerns with On-site Burial

- ◆ Potential for surface and groundwater contaminated groundwater
- ◆ Discovery of intact carcasses during the excavation of a school 15 years later

A 1984 on-farm
burial site at present



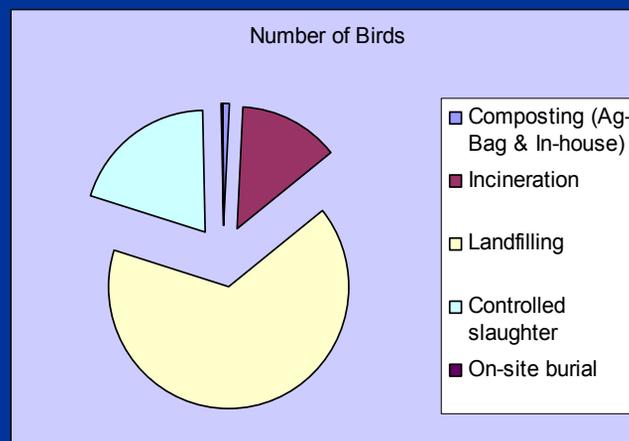
...and where intact
carcasses were
discovered during
excavation in 1998.

Methods of Disposal Used in 2002*

Method of Disposal	Number of Birds	Percent of Total
On-site Burial	15,000	0.3
Controlled slaughter	943,000	19.9
Incineration	641,000	13.4
Landfilling	3,103,000	65.5
Composting (Ag-Bag & In-house)	43,000	0.9
Total	4,732,000	100.0

* Rendering was not utilized in 2002 because of biosecurity concerns.

Methods of Disposal Used in 2002



On-site Burial in 2002

Lessons learned in 2002:

- ◆ Tremendous opposition from neighbors concerned about groundwater contamination
- ◆ Changes in DEQ waste regulation resulted in more stringent criteria for on-site burial
 - Deed notification, monitoring wells, less birds per trench, and increased liner requirements
 - A mini-landfill in essence!

Controlled Slaughter (2002)

Lessons Learned in 2002:

- ◆ Difficult to coordinate processing with other non-infected birds
- ◆ Marketing obstacles in foreign trade make this option less desirable and promising for disease containment
- ◆ Increased concern about disease transmission to humans

Incineration (2002)



Incineration (2002)

Lessons learned in 2002:

- ◆ Logistics of providing enough quality wood
 - Four tons of wood per ton of carcass
- ◆ Management of loading incinerators
- ◆ Effect of weather on carcasses and wood
- ◆ Management of carcass fluids during decomposition
- ◆ Management of smoke and air emissions
- ◆ Neighbor relations and location
- ◆ Ash disposal (i.e., 6000 tons)

Landfilling (2002)



Landfilling (2002)

Lessons learned in 2002:

- ◆ Logistics of providing enough trailers and trucks with “wet lines” to operate dump trailers
- ◆ Worker safety concerns with loading and unloading
- ◆ Requires significant resources:
 - Track hoe, lighting, equipment, C & D crews, lining for trailers, stabilizing material for wet conditions
- ◆ Requires good communication between personnel at farm and landfill

Landfilling (2002) (cont'd)

Lessons learned in 2002:

- ◆ Infected litter and feed still have to be disposed of after carcasses are removed from houses (i.e., 5000 tons with a \$10 incentive from USDA)
- ◆ Biosecurity concerns
- ◆ Disposal at small local landfills was logistically challenging
- ◆ Disposal at mega-landfills was easier, but presented biosecurity concerns because of distance

Composting

- ◆ Ag-Bag
 - 1 commercial layer operation
 - 1 commercial turkeys after in-house composting
- ◆ In-House Composting
 - One grow-out turkey flock (10 pound birds)
 - One flock of turkey poults (< 5 pounds)

Composting

In-House Composting turns to Ag-Bag Composting



Composting (cont'd)

Lessons learned in 2002:

- ◆ Ag-Bag Composting
 - Potential for disease spread
 - Difficult to obtain a uniform mixture
 - Challenging to get correct moisture content
 - Need for further processing after removing compost from bag
 - Virus isolation tests showed adequate temperatures were achieved to kill the AI virus

Composting (cont'd)

Lessons learned in 2002:

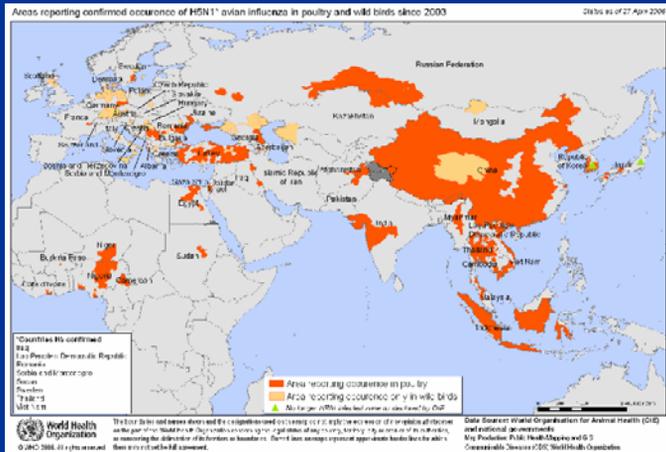
◆ In-House Composting

- Need for proper management of the process by grower and integrator
- Challenging to get correct moisture content
- Virus isolation tests showed adequate temperatures were achieved to kill the AI virus
- Logistics of obtaining additional carbon material

Carcass Disposal in 2006 and Beyond



Bird Flu in Europe



Off Site Disposal?

- ◆ Although landfilling evolved into the preferred method of disposal in 2002, concerns about disease transmission and the potential for human health impacts make on-farm disposal methods increasingly attractive.

Avian Influenza Research and Composting

- ◆ *Research indicates that Avian Influenza Virus (AIV) can be inactivated in 10 minutes at 140°F (60°C) or 90 minutes at 133°F (56°C) (Lu et al., 2003).*

Benefits of in-house composting

- ◆ Limits the risks of groundwater and air pollution
- ◆ Limits the potential for farm-to-farm disease transmission
- ◆ Limits transportation costs and tipping fees
- ◆ Limits tipping fees
- ◆ Deactivate pathogens in carcass and litter
- ◆ Limit public perception and disease exposure

The Delmarva Experience

- ◆ In 2004, an avian influenza outbreak occurred on the Delmarva Peninsula.
- ◆ In-house composting was used as the disease containment and carcass disposal method on 5-pound broilers.
- ◆ Avian influenza was confined to 3 poultry farms despite being in a very concentrated poultry area.
- ◆ There were over 4 million birds within a 2-mile radius of affected farms.

Research in Virginia

- ◆ Research was successfully conducted in Virginia in 2005 to demonstrate the effectiveness of in-house composting on large turkeys.
- ◆ We are currently participating in research on in-house composting in breeder, layer, and double-decker houses.



Results of In-House Composting of Turkeys

- ◆ Very little remained of the carcasses after two weeks.
- ◆ Temperatures reached and maintained temperatures of at least 130 degrees for 5 days
- ◆ All carbon materials were effective in composting
- ◆ Tilling enhanced the composting process by 3 days.
- ◆ Crushing increased temperatures and decreased down time by 11 days.

Results of In-House Composting (cont'd)

- ◆ With a good base, cap, and proper disease monitoring, the compost can be moved out of the poultry house within 3 to 4 weeks.
- ◆ In the worst case scenario, two tractor trailer loads of carbon material per house may be needed to promote composting.
- ◆ However, 7 semi trailer loads were needed to haul carcasses from a typical house in 2002.

What about breeder, layer, and double-decker houses?



Different House Designs

- ◆ We are working with Integrators to identify and research in-house composting for all house designs.
- ◆ On-farm demonstration with West Virginia Dept. of Agriculture



Down Time for Poultry Houses in 2002

- ◆ Average of 74 days
- ◆ Average of 10 ½ weeks
- ◆ Lowest number of days = 25
- ◆ Highest number of days = 177



Questions?



Contact Information

Gary A. Flory

gaflory@deq.virginia.gov

540-574-7840