Avian Influenza Carcass Disposal

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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

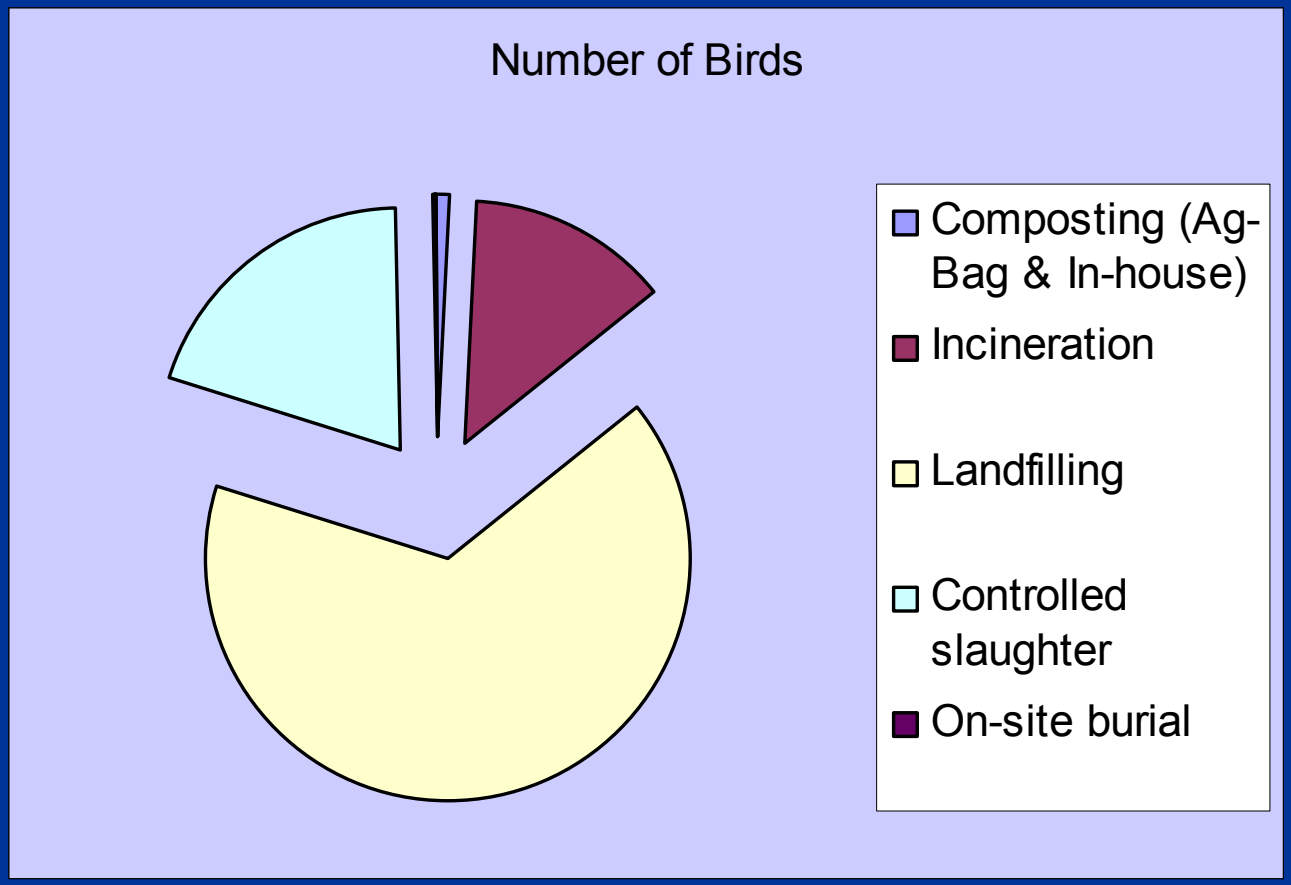
…and where intact carcasses were discovered during excavation in 1998.

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

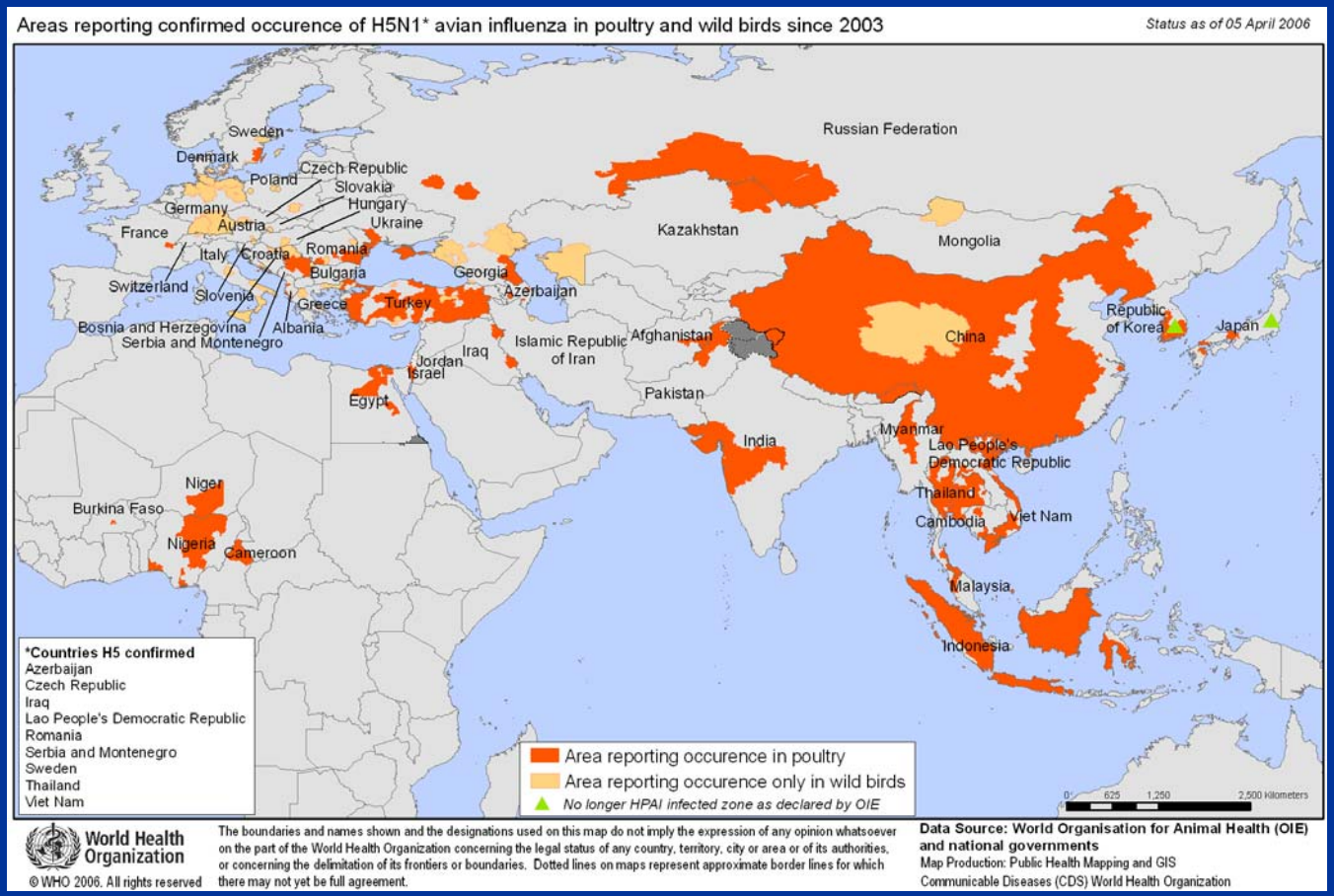
Composting (cont'd)

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

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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 of composting poultry carcasses has shown that the avian influenza (AI) virus can be inactivated at 140° F (60° C) in 10 minutes or 15 to 20 minutes at 133°F (56°C) (Senne et al., 1994).

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

Conclusions

- Landfilling was the preferred method of disposal in 2002 despite its costs.
- In-house composting appears to be the most promising disposal option to contain disease outbreaks and minimize disposal costs.
- Public perception can quickly influence what are acceptable disposal options.
- Contingency plans for on-farm disposal options have to be developed and maintained.

Questions?

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