

Simulating the Spread of Highly Pathogenic Avian Influenza Virus for the Purposes of Informing Exercises

The North American Animal Disease Spread Model

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NAADSM
Development
Team

Applications of the *North American Animal Disease Spread Model (NAADSM)*

- Estimate magnitude of consequences for risk analyses
- Evaluate disease control strategies, plans, and policies
- Assess potential economic impacts and associated control measures
- Estimate resources needed in the event of an outbreak
- Targeting areas for preparedness and surveillance
- Create simple scenarios for teaching or complex scenarios for analysis
- Provide realistic scenarios for exercises

Outline

1. Who, what, where, when, why, & how?
2. Resulting scenarios
3. Major outcomes

Who requested a realistic scenario?

- National Veterinary Stockpile (NVS)
 - Homeland Security Presidential Directive – 9
 - Designed to augment local/State resources by deploying supplies within 24 hours
- Federal Area Offices
- State Departments of Agriculture

What did we do?

- Developed realistic scenarios for four table-top, discussion based exercises



Where and when did we do this?

- North Carolina

- July, 2006

- Georgia

- October, 2006

- Delaware

- September, 2007

- South Carolina

- September, 2008

Why did we do this?

1. Identify personnel resources needed to respond to an HPAI event
2. Identify equipment and supplies for possible inclusion in the NVS
3. Refine procedures for deploying the NVS
4. Exercise portions of State response plans



How did we do this?

■ Literature search

- Information from 38 different sources was found to be applicable
 - Text books
 - Peer-reviewed literature
 - Descriptive reports of previous outbreaks
 - Conference proceedings
 - Response plans
 - OIE website

How did we do this?

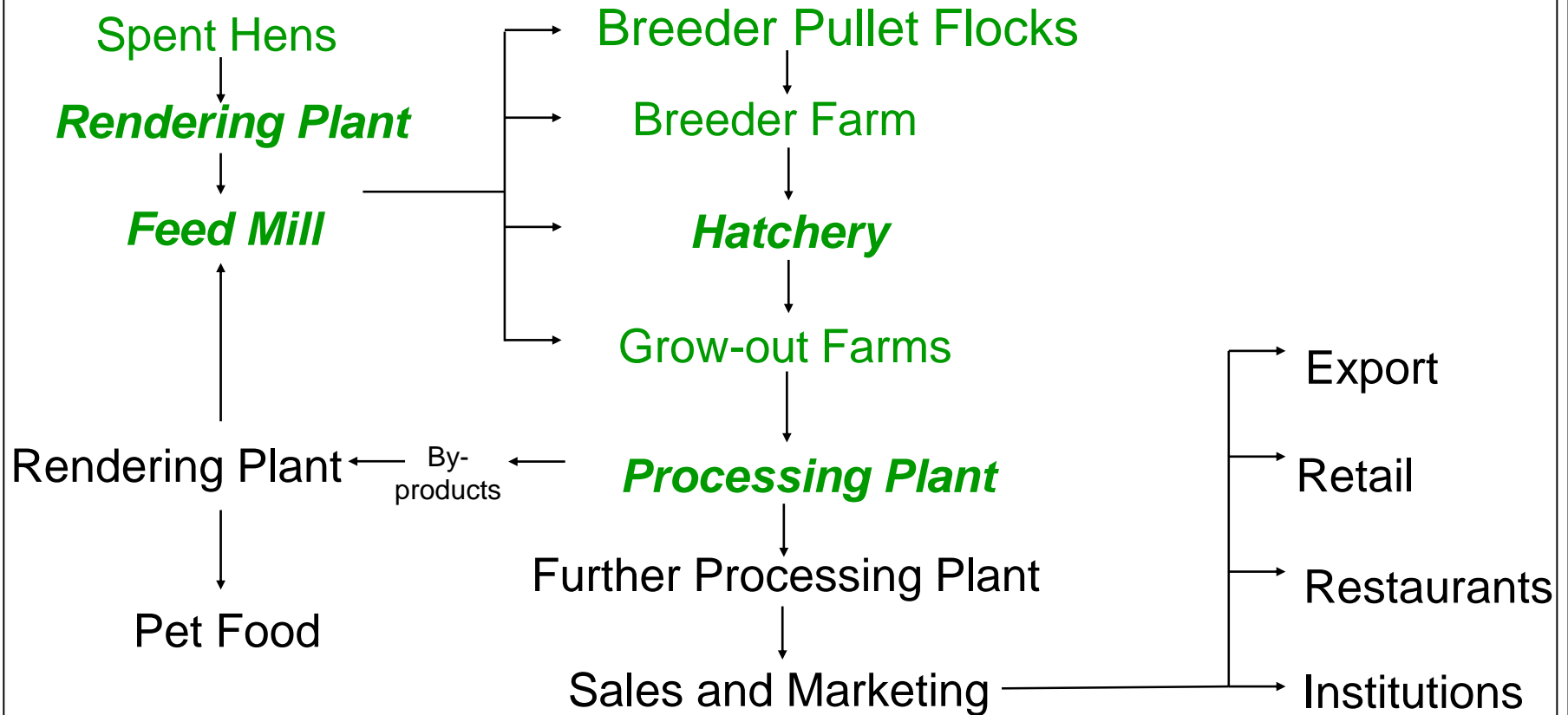
- **Solicited Expert Opinion**

- Poultry Specialists in North Carolina & Georgia
 - Consultants
 - Government employees
 - Extension agents

- **Mapped the production process**

How did we do this?

■ Broiler production process



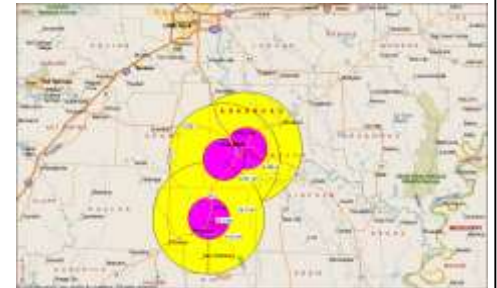


How did we do this?

■ Define control strategies

■ Response Plan

- Will you depopulate detected diseased flocks?
- Will detection trigger a ring?
- What will the radius of the ring be?
- Will you pre-emptively depopulate flocks?
- Will you depopulate direct contacts?
- Will you depopulate indirect contacts?
- Will you vaccinate?



How did we do this?

■ **Define control strategies**

■ Emergency Management Staff

- What method of depopulation will you use?
- How many resources are available to accomplish vaccination and depopulation?
- How many flocks can be depopulated/day?
- How many flocks can be vaccinated/day?
- How will you prioritize efforts if you get behind?

How did we do this?

■ **Population information**

- State or industry owned data
 - North Carolina Multi-Hazard Thread Database
 - Georgia Poultry Industry Database
 - Delmarva Poultry Industry Database
 - South Carolina National Animal Identification System (NAIS) Database

Resulting Scenarios

- Output associated with each scenario was one example of potential scope and impact that a HPAI outbreak may have in each of the respective States
 - 63 days
 - 25 backyard flocks (4,070 birds)
 - 15 broiler flocks (1,128,280 birds)
 - 2 broiler pullet flocks (51,834 birds)
 - 143 days
 - 167 backyard flocks (90,239 birds)
 - 43 broiler flocks (3,108,000 birds)
 - 1 egg type layer flock (32,000 birds)
 - 4 meat type breeder flocks (69,000 birds)
 - 16 days
 - 1 backyard flock (65 birds)
 - 1 broiler pullet flock (50,000 birds)
 - 4 Roaster flocks (343,400 birds)
 - 9 broiler flocks (632,400 birds)

Major Outcomes

- Identified material requirements to be stockpiled
- Identified gaps in combined federal, State, and industry resource capabilities
- Provided a realistic assessment of the scope and limits of the NVS
- Identified capabilities needed to effectively deploy NVS resources
- Exercised portions of State response plans
- Brought together federal and State agencies, the private sector, and others involved in a response