LESSONS LEARNED DURING RECENT HIGHLY PATHOGENIC OUTBREAK & EMERGENCY PREPAREDNESS FOR AVIAN INFLUENZA OUTBREAK

Virginia Emergency Management Conference
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Panelists

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  Virginia Department of Health

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  Regional State Veterinary Supervisor
  
  VDACS, Office of Veterinary Services

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Three types of influenza viruses: A, B, and C

Influenza A viruses can infect many species

- Humans
- Birds
- Pigs
Influenza Subtypes in Birds

- **H5**
  - Occasional human illness, but severe disease
  - H5N1 detected in 16 countries

- **H7**
  - H7N9 is currently circulating in China
  - Cause variable disease in poultry
Clinical Signs of Avian Influenza in Birds

- Low Pathogenic (less severe disease)
  - No clinical signs
  - Ruffled feathers
  - Decrease in egg production

- Highly Pathogenic (more severe disease)
  - Depression
  - Diarrhea
  - Coughing, nasal discharge
  - Swelling and hemorrhage of comb/wattles
  - Sudden death
Sick Birds
Historic Outbreaks (High Path)

- 1924: H7 outbreak was contained and eradicated in East Coast live bird markets
- 1983-1984: H5N2 outbreak resulted in humanely euthanizing approximately 17 million chickens, turkeys and guinea fowl in Pennsylvania and Virginia to contain and eradicate the disease
- 2004: USDA confirmed H5N2 outbreak in chickens in Texas
Historically, avian influenza has been eliminated from commercial poultry in US and Canada.

Federal and state officials conduct routine surveillance for AI in commercial poultry, live-bird markets and backyard flocks.

Samples from birds are collected and preliminary testing occurs regularly at authorized laboratories:
- Including VDACS Regional Animal Labs
- Any non-negatives on testing are sent to the USDA’s National Veterinary Services Laboratories (NVSL) for confirmation.
Avian influenza is reportable diseases in VA
- State Veterinarian’s office at VDACS

All HPAI outbreaks in US are controlled according to the USDA’s Red Book, the Highly Pathogenic Avian Influenza Response Plan

H5 and H7 are notifiable internationally and must be reported to the World Organization of Animal Health (OIE)
- Potential to mutate
- Free: 90 days after last infected premise C&D
Concern

- The potential for rapid spread and significant illness and death among poultry during outbreaks of highly pathogenic avian influenza
- The economic impact and trade restrictions from a highly pathogenic avian influenza outbreak
- The possibility that avian influenza A viruses could be transmitted to humans
  - H7N2 transmission to person in Virginia, 2002
Why Are We Concerned?
VIRGINIA POULTRY INDUSTRY IS...

- Directly and indirectly supporting nearly 52,000 jobs in Virginia
- Contributing more than $13 billion to Virginia’s economy
- Producing an affordable & wholesome source of protein to help meet growing nutritional requirements in the U.S. and around the world
- Producing the finest poultry products anywhere and doing so in the harmony with Virginia’s natural resources
- More than 1,100 family-owned farms

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History of Recent Outbreak

- **December 2014**
  - H5N2 identified in ducks from Washington
  - H5N8 also identified in ducks from Washington
  - H5N8 detected in backyard flock in Washington

- **January-February 2015**
  - Novel H5N1 reported in a duck from Washington
  - Multiple detections of H5 viruses in poultry in Pacific Northwest

- **March 2015**
  - Multiple detections of H5N2 in poultry along Mississippi and Central flyways

- **January 2016**
  - Different strain
  - Last detection of HPAI in commercial poultry in Dubois Co, Indiana.
  - 12 premises->400,000 turkeys destroyed plus 1 layer operation.
Epidemiology

- Source H5N2 Serotype appears to be wild waterfowl from Asia > Siberian Strait > BC > WA > OR > CA > Eastward

- Epidemiology of disease spread:
  - Equipment, boots, equipment not being disinfected on and off farm
    - SOLUTION - BIOSECURITY
  - Feathers, dust, moisture, wind
    - SOLUTION – RAPID VIRUS CONTAINMENT

- This virus strain tends to infect turkeys at a lower dose

- In the Midwest, there were few reports of backyard poultry infections but started with BYFs.
All HPAI Detections in Commercial, Backyard, and Captive Wild Birds
December 8, 2014 to August 31, 2015
Steps to Halt AI

- **Quarantine**—restricting movement of poultry and poultry-moving equipment into and out of the control area
- **Eradicate**—mass depopulation
- **Monitor region**—testing wild and domestic birds in a broad area around the quarantine area
- **Disinfect**—killing the virus in the affected flock locations
- **Test**—confirming that the poultry farm is AI virus-free
Zones

- Infected Zone (3km)
- Buffer Zone (10km)
Mass Depopulation

- Goal within 24 hours of confirmation
- Humane
- Limit human exposure to AI by using PPE
- Accommodate large-scale eradication efforts

Methods
- Water-based foam (preferred)
- Ventilation shutdown
Mass Depopulation
Disposal Methods

- Landfilling: limitations on what they accept
- Rendering: aerosolization of virus
- Incineration: fuel requirements, costly
- Burial: environmental concerns
- Composting: not feasible for all operations but is the preferred method of disposal
Disposal
Outbreak Summary of 2015 Event

- Wild bird detections: 5 states
- Commercial detections: 15 states
- Largest number of detections: Minnesota (101)
- Largest number of birds depopulated: Iowa (>31 million)
- Largest flock size: 4.9 million birds
Economic Impact to US

- >40 countries banned imports
- Cost: >$950 million
Current Activities in Virginia

- Wild bird surveillance (USDA)
- Reviewing biosecurity plans and protocols
- Planning
  - USDA: Indemnity and epidemiology of incident
  - VDACS: Operates via an IMT with IC & General staff
  - Industry (poultry companies): Conduct testing
    - During event: depop, disposal as contractors
  - DEQ: Takes lead role in disposal of dead birds.
  - VDH: Public health concerns and safety
  - Others
Emergency Agencies Potential Support to an AI Event

- Public Safety – Securing roadways in identified areas where biosecurity has been established.
- Fire Departments - Water resources for euthanization foaming operation.
- Rescue Squads- Transporting Injured Emergency Responders from index farm(s) to local treating facilities.
- Decon of personnel
The Poultry Integrators Role during An AI Event

- Poultry Company Senior Veterinarian participation with the unified command module.
- Index Farm Bio-Security
- Disease Surveillance
- Medical Surveillance of Company Personnel
- Index Farm Occupational Safe Work Practices
- Depopulation
- Composting
- Decontamination/Sanitation
Sample Farm Layout / Diagram w/ ZONES

Minimum Distance to barrier – 70’ (feet)

- **HOT ZONE**
- **Chicken Houses**
- **Owner / Operator Barn**
- **Owner / Operator Residence**
- **COLD Zone**
- **WARM Zone** – Decontamination area, Mobile Decon Unit, PPE disrobe, etc.

- **Main Access Gate** – Security Controlled
- **Single Hot Zone Entry Point**
- **Blocked Entrances - No entry / Exit**
- **Secondary Access Driveway**
- **Main Road**
- **Alternate Parking Areas**

**Water Trailer**
# AI PPE vs. Chemical

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<thead>
<tr>
<th>AI PPE</th>
<th>Hazardous Material PPE</th>
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<tbody>
<tr>
<td><strong>Class C PPE</strong></td>
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<tr>
<td>- N95 Particulate Respirator</td>
<td>- APR- Respirator</td>
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<tr>
<td>- Eye protection</td>
<td>- Chemical Resistance Clothing</td>
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<tr>
<td>- Chemical Resistant Coveralls</td>
<td>- Gloves applicable to the chemical</td>
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<tr>
<td>- Rubber Gloves</td>
<td>- Protective footwear applicable to the chemical</td>
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<td>- Disposal Outer Footwear</td>
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<tr>
<td><strong>Class B PPE</strong></td>
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<tr>
<td>- PAPR/APR</td>
<td>- SCBA – Respirator</td>
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AIR Responder PPE

Class B PPE

Class C PPE
Responder Medical Requirements

- Within 12 months of event:
  - Seasonal flu vaccine
  - Respiratory medical clearance
  - Respiratory fit testing

- Medical surveillance
  - After demobilization
  - Monitor for flu-like symptoms for 10 days
  - Local health departments