Avian Influenza: What Is It and Why Should We Care?

Why Should We Care about HPAI?

- Bird Welfare
  - Causes illness, suffering, and death
- Economics
  - Poultry and egg prices
  - Local and national economics
  - U.S. = $50B, WA = $168M
  - Prevents international trade
- Public Health
  - Potential for mutations endangering human health

Proposed Mechanism of Pandemic Influenza Virus

Avian Influenza (AI)

- Pathogenicity tells us how deadly the virus is to birds
  - Low pathogenicity (LP) vs high pathogenicity (HP) types
  - LP strains can mutate to HP strains
- Subtypes tells us whether there is a human health concern
  - 16 hemagglutinin (H1-16) and 9 neuraminidase (N1-9) subtypes
  - Some H5 & H7 subtypes mutate in chickens, turkeys, game birds
- Migratory waterfowl are natural reservoirs
  - Some subtypes can make birds sick and interfere with normal migration patterns
  - Subclinical subtypes in wild birds can be problematic for backyard flocks

TAKE HOME MESSAGES:
SEPARATE SPECIES AND STAY AWAY FROM POULTRY IF YOU ARE SICK!

Worldwide Wild Waterfowl Flyways


World Animal Health Information Database

www.oie.int/wahis_2/public/wahid.php/Diseaseinformation/WI
Signs of Avian Influenza

- Sneezing
- Coughing
- Decreased appetite
- Drooping wings
- Neurologic problems
- ↓ or no egg production
- Discolored shanks/feet
- Cyanotic comb/wattles
- Swollen comb/wattles
- Diarrhea
- Depression
- Oral/nasal discharge
- Labored breathing
- Elevated resp. rate
- Sinusitis
- Ruffled feathers
- Sudden DEATH

Economics of 2014-2015 HPAI Outbreak (USDA ERS data)

- Largest livestock/poultry health disaster in U.S. history
- 12/14 to 6/15: >50M U.S. chickens and turkeys died/destroyed to stop spread
- >50 countries barred imports of U.S. poultry items ($1.3B less revenue)
- Restricted egg supply; highest egg prices in >30 yr.
- Government expenses ~$879M
  - $610M response (depop, cleaning, disinfection, cleanup)
  - $34M fall planning costs (surveillance, biosecurity, stockpiling)
  - $200M indemnity payments (100% of birds' fair market value)
  - $35M overtime, travel, supplies
- Take home message: Avian Influenza outbreaks are EXPENSIVE!

What Pro-active Activities Are Happening?

- Surveillance at live bird markets throughout WA and U.S.
- Egg collection statewide
- NPIP program (36 WA members)
- Testing dead poultry
- Response to sick bird calls
- Mandatory reporting of high morbidity and mortality events
- WDFW testing sick/dead waterfowl

2014-2015 HPAI Outbreak in WA

BIOSECURITY BREACHES PLAYED A LARGE ROLE IN THE OUTBREAK

2020 NC/SC LPAI/HPAI Outbreak

- March 2020: LPAI on 11 NC and 1 SC turkey farm
  - One introduction with secondary spread
  - LPAI H7N3 of wild waterfowl from MS flyway
  - 361,000 birds depopulated on infected premises
  - 2nd SC flock affected outside surveillance zone
- April 6: sick turkeys on one SC premises with 5 barns
- April 8: 4 barns confirmed with LPAI, 1 with HPAI
  - Mutation from LPAI
  - 34,160 commercial turkeys died or euthanized
  - No additional cases after April 6
- May 28: Quarantine released

HPAI contained to one farm due to surveillance, observant and responsible owner, and quick response and containment

WSDA’s Response to an HPAI Outbreak

- Determine the nature of the outbreak
- Farm visit within 4 hours (state, federal); history, case evaluation, sample collection; lab results and confirmation
- Initiate the appropriate response
  - Notify agency partners, quarantine premise; 10 km zone restricts poultry product movement; community outreach and education; enhanced surveillance
- Disease control and eradication
  - Humane bird depopulation with indemnity; composting, incineration, burial; premise cleaning and disinfection; down time; flock plan for repopulation
- Ensure recovery and resumption of business
  - U.S. poultry export market value = $6.5 billion
  - U.S. breeders supply 75% of world’s hatching eggs and chicks
Investigation Protocol

**Identify**
- Poultry owner/caretaker notices increased death rate or signs of illness in birds
- Owner/caretaker contacts private or state veterinarian
- Private veterinarian notifies state veterinarian

**Sample**
- Veterinarian collects samples from birds and submits for preliminary testing to WADDL
- Samples testing positive for H5/H7 virus sent to USDA National Veterinary Services Laboratory

**Stop**
- Stop movement order issued until results determined
- Biosecurity and control measures instituted

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The Disease Triad

Disease occurs when environmental, pathogen, and host factors align

To reduce the likelihood of disease, address each factor:
- **Increase host resistance**
- **Correct environmental conditions promoting disease**
- **Reduce pathogen exposure**

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Host Factors: Increase Bird Resistance

- Ensure proper nutrition
  - Provide proper quantity/quality of food & water
  - Commercial diets more likely to meet birds’ needs
- Monitor weight/body condition periodically
- Give proper diet for stage of life and production
- **Do not feed on the ground**
- Consult veterinarian to discuss illness & treatments
- Vaccinate birds against diseases of concern
- Minimize bird stress

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Increase Bird Resistance

**Minimize Bird Stress**
- Establish a calm and consistent environment
- Limit visitors and caretaker changes
- Reduce competition for resources
- Minimize changes in bird groups
- Control predators

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For Pete’s sake, PLEASE be a responsible bird owner!
Reduce Environmental Factors

- Provide excellent air quality via effective ventilation
- Protect birds and their environment from flooding and wetness
- Emphasize sanitary conditions to decrease exposure to pathogens
- Maintain proper temperatures for bird comfort
- Control dust in pens
- Prevent overcrowding
- Control flies, vermin, etc.

Reduce Pathogen Factors

- Keep flock closed (prevent new pathogen introduction)
- Quarantine & monitor new/returning birds for 30 days
- Separate birds by age (older birds are a risk for younger birds)
- Reduce pathogen dose and delay age of exposure so bird’s immune system can respond and minimize illness
- Expose facilities and equipment to sunlight to kill pathogens
- Separate species and prevent contact with sick humans
- C&D regularly to ↓ pathogen concentration

Cleaning and Disinfection

1. Thoroughly clean all surfaces with soap & water
   - Cleaning means removing all visible debris (manure, bedding, dirt, feed, feathers, etc.)
2. Rinse well & let dry if possible
3. Apply an appropriate disinfectant
   - Use proper concentration for recommended contact time
4. Rinse & let dry before restocking premises or using equipment

Biosecurity

- Actions taken to reduce the introduction and spread of diseases on a farm
- Emphasis on PREVENTION vs treatment

Benefits of Biosecurity:

- Reduces pathogen numbers and likelihood of disease
- Increases productivity and production
- Decreases medication use, including antibiotics
- Enhances reputation and flock value
- Addresses animal welfare by reducing pain, sickness, and death

Cleaning and Disinfecting


How Do I Implement Farm Biosecurity?

Work with your veterinarian within a valid VCPR to establish practical, cost-effective biosecurity plans for your farm.
Biosecurity Summary

- Keep a closed flock
- Separate species
- Do not allow contact between sick humans and poultry
- Remove dead birds and isolate sick birds immediately; treat or euthanize as needed
- Quarantine new or returning birds for 30 days; watch for signs of illness
- Know signs of illness of various diseases and monitor birds closely
- Clean and disinfect equipment, footwear, facilities, etc. properly
- Prevent contamination of feed and water
- Wash hands before handling birds and between bird groups
- Wear clean clothes and disinfected footwear
- Protect/separate birds from wild waterfowl, flies, rodents, animals
- Vaccinate for diseases of concern
- Purchase birds from NPIP-certified flocks

What If You Have Sick Birds?

- One or two sick or dead birds or typical losses: contact your veterinarian
- Contact state veterinarian or avian health program if:
  - Unusual signs of illness
  - Marked increase in number of sick birds (increased morbidity)
  - Marked increase in number of dead birds (increased mortality)

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Dealing with Sick Birds

- Isolate immediately
- Discuss signs of illness with veterinarian
- Make decision on treatment vs. culling ASAP
- Keep records regarding treatment, response, results
- Do healthy animal chores first, or designate one caretaker for sick animals
- Wash hands and change clothing and footwear after handling sick animals
- Have separate equipment for isolation area

Educate Yourself:
Keep in the Loop on Diseases

- WSDA listserv*
- Poultry associations
- Chat groups sharing FACTUAL information

*https://agr.wa.gov/contact-us/listservs

Virus, Virus, Where Is the Virus?

- Make biosecurity practices ROUTINE because we never know where and when disease agents may be introduced.

Do You Have a Quarantine Area for New or Returning Birds?

Percent of small-scale farms that quarantined new/returning livestock or poultry in the last year

Reasons these farms did not consistently quarantine new/returning livestock or poultry

Biosecurity is our “health seatbelt!”
Resources

• WADDL Avian Health and Food Safety Laboratory, Puyallup https://waddl.vetmed.wsu.edu/avian
• Extension Small and Backyard Poultry https://poultry.extension.org
• Poultryhub.org http://www.poultryhub.org/
• U.S. Poultry and Egg Association http://www.uspoultry.org/
• Biosecurity and Disinfection www.cfph.iastate.edu

Who We Are

• AAVLD accredited laboratory
• Branch lab of Washington Animal Disease Diagnostic Lab
• Phone: (253)445-4537
• Email: waddlahl@vetmed.wsu.edu
• Address: 2607 W Pioneer, Puyallup, WA 98371

What We Do

• Accurate, state-of-the-art, timely, and cost-effective diagnostic services, consultation, disease surveillance and outreach
• Safeguard animal health, food supply, & public health
• Accept owner and veterinary submissions

Avian Health & Food Safety Lab
Diagnostic Testing to Monitor Your Flock’s Avian Influenza Status

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Dept of Veterinary Microbiology & Pathology
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Avian Influenza Testing · Serology

• Principle: evaluate for antibodies produced by the immune system in response to avian influenza infection
• Sample: clotted whole blood, serum
• Pros: affordable ($5/sample)
• Cons: sample collection, false negative in the face of acute infections
Avian Influenza Testing – RT-PCR

- Principle: evaluate for presence of viral genomic material (RNA)
- Sample: choanal swab in transport media
- Pros: sensitive for active infections
  - Cons: expensive ($50/sample)

Could there be something else going on?

More Questions?

- Visit our website!
  https://waddl.vetmed.wsu.edu/avian

- Or give us a call!
  (253)445-4537