Avian Influenza in Wild Birds

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Washington Department of Fish & Wildlife
Avian Influenza: Background

- Waterbirds are the natural reservoir of all influenza “A” viruses
- “Evolutionary equilibrium” between avian influenza viruses and waterbirds
Number of Hemagglutinin Subtypes Isolated

Number of Isolates

Subtypes

1998
1999
2000
Avian Influenza: Background

Reassortment and mutations allow bird viruses to infect other species. Can change between Low Pathogenic Avian Influenza (LPAI) and High Pathogenic Avian Influenza (HPAI).

No known human cases of Asian H5N1 from healthy wild birds

Human infection from Asian H5N1 is currently rare
Avian Influenza: Background

• Influenza viruses seldom cause problems in wild birds

• Exceptions:
  - Common terns in South Africa 1961
  - Numerous species in Europe and Asia 2005
Areas Reporting H5N1 AI in Poultry & Wild Birds

- Area reporting occurrence in poultry
- Area reporting occurrence only in wild birds
- No longer HPAI infected zone as declared by OIE
Western Europe 2006: 307 Dead Wild Birds

- 54% swans
  - 13% *Aythya* sp.
  - 10% unspecified

- 23% ducks
  - 13% *Aythya* sp.
  - 10% unspecified

- 11% raptors
  - 2% *Buteo* sp.
  - 9% unspecified or misc.

- 6% geese
  - 1% *Branta* sp., *Anser* sp.
  - 5% unspecified

- 6% Misc.
  - grebes, coots, gulls, mergansers, herons
North American Flyways
Migratory birds in the Central Asian, North Pacific, East Asian flyways intermingle during what season?

A. Winter
B. Spring
C. Summer
D. Fall
Overlap of Migratory Bird Flyways

- Central Asian-Indian Flyway
- East Asian-Australasian Flyway
- West Pacific Flyway
Avian Influenza: Early Detection Efforts

U.S. Interagency Strategic Plan

1. Investigation of morbidity and mortality events in wild birds
2. Surveillance for Asian H5N1 in live wild birds
3. Surveillance for Asian H5N1 in hunter-killed wild birds
4. Environmental sampling (feces/water)
5. Sentinel animal methods
Avian Influenza Surveillance – Morbidity & Mortality Events

• Continue routine investigations

• Target single sick and dead raptors and aquatic bird species for avian influenza testing

• University of Washington COASST Program

• Lead-poisoned trumpeter swans in NW Washington

• Selected sick and dead birds at wildlife rehabilitation centers (WSDA)
Avian Influenza: Testing

• Testing and confirmation may take several weeks

• Screening for H5 or H7 takes 1–2 days

• Genetic typing to identify H5N1 may take 1–2 weeks

• Further testing required to identify highly pathogenic strains
Avian Influenza: What Hunters Should Know

• Do not harvest or handle birds that are sick or found dead
• Keep your harvested birds cool, clean, and dry
• Do not eat, drink, or smoke while cleaning birds
• Wear rubber gloves when cleaning all harvested animals
• Wash your hands with soap and hot water after cleaning birds—use alcohol wipes for minor cleanup
• Clean all tools and work surfaces immediately with hot soapy water; disinfect with 10% chlorine bleach solution
• Cook birds thoroughly (internal temperature of 155–165°F) to kill viruses, bacteria, and parasites

Good hygiene and common sense!
Avian Influenza: Personal Protection

• Healthy wild birds or “normal” wild bird mortality
  ▪ Good hygiene and common sense
  ▪ When possible, gloves and eye protection

• Unusual mortality event (Asian H5N1 suspected)
  ▪ Good hygiene and common sense
  ▪ Coveralls, boots, gloves, eye protection, N95 respirator

• Asian H5N1 confirmed
  ▪ Good hygiene and common sense
  ▪ Coveralls, boots, gloves, eye protection, N95 respirator
  ▪ Seasonal influenza vaccine
  ▪ Prophylactic influenza antiviral medication
  ▪ Health monitoring
Revenge of the Gamebirds

VIC HARVILLE/Stephens Media Group
Thank You

Photo by Ciam Sawyer
Animal Impacts of Avian Influenza

Leonard E. Eldridge, DVM
Washington State Dept of Agriculture
State Veterinarian
Avian influenza (AI) circulates in wild birds worldwide without apparent disease.

- Virus excreted in their feces.
- Virus can infect other birds.
- Virus can develop ability to cause disease under certain conditions in other birds by mutation or reassortment.
Avian Influenza Pathogenicity

**Low Pathogenicity**
- No or mild disease
  - Low / no death rate
  - Any subtype
  - Replicates only in gut

**High Pathogenicity**
- Acute, systemic disease
  - High death rate
  - H5 or H7 subtypes
  - Replicates throughout body
Avian Influenza: A Bird Disease

• Highly pathogenic – deadly to birds
  ▪ Asian Highly Pathogenic Avian Influenza (HPAI)
  ▪ North American HPAI (B.C., Texas, New Jersey)

• Endemic low pathogenicity – common in waterfowl

• Pandemic influenza – human disease that has not yet happened
Avian Influenza Control

• Living with avian influenza is a time bomb
  ▪ Because the virus is unstable and changes

• Surveillance, identification, and immediate response are key to controlling initial outbreak
What Is WSDA Doing About AI?

- Asian HPAI does not exist in the United States
- “There aren't many things in medicine you can say 'zero' about, but there is a zero chance you will get the bird flu in the United States right now.”

Dr. Steven Garner
New York Methodist Hospital
Avian Influenza Economic Impact

• 2004 BC in Canada excess of $300 million
  ▪ Ripple effect millions more

• Projected cost to industry and export market by the American Meat Institute
  ▪ Monthly losses of $142 million in US exports
  ▪ Monthly losses of $104 million in US domestic price
  ▪ Disruption of the economy in the region
  ▪ $2.9 billion and over 40,000 US jobs lost
State Avian Health Program

- Avian health veterinarian
- Program coordinator
- Avian health technicians
- Surveillance and testing
- Education
- Training and biosecurity
- Public relations
- Applied research, epidemiological studies, and preventative medicine
Avian Influenza Control Actions

- Prevention
- Surveillance
- Detection

- Containment
- Eradication
- Recovery

Be prepared for an outbreak
Prevention

- Strict import restrictions
- Biosecurity
- Surveillance
- Education and outreach to bird owners and the public

*Complete prevention is not possible*
Canada-U.S. Border
Cleanliness and Common Sense

- Keep your distance
- Segregate from wild birds
- Keep it clean
- Don’t take disease home
- Don’t borrow disease
- Know the warning signs
- **Report sick birds**
An Industry on Wheels…

- Cleaning crew
- Live haul (chickens)
- Grower/employees
- Live haul (equipment)
- Poultry trailer
- Shavings
- Rendering truck
- Servicemen
- Tractors
- Loading crew
- Feed truck
- Fuel truck
- Truck shop
- Snow plow
- Trash truck
- etc.

Dr. Lloyd Weber, 1990
Question

Which of the following is the **lowest** risk factor for introducing avian influenza into the flocks of poultry raisers?

A. **Birds of two different ages in same house**

B. **Purchasing processed poultry products from the grocery store for a workers family**

C. **Rodent infestation**

D. **Grower visits other poultry farms**
Top 10 Risks

1. Employees attend cock fights
2. Wild birds in poultry houses
3. Employees own poultry
4. Family of employees own birds
5. High farm density in the region
6. Birds of two different ages in same house
7. Rodent infestation
8. More than one species of birds on farm
9. Shared dead bird disposal
10. Grower visits other poultry farms

Vaillancourt, 2003
Occupational Concerns

- Agricultural first responders
- Immunization priority
- Antiviral prophylaxis

- Personal protective devices
  - Adequate vs. practical
...the end.
Animal Impacts of Avian Influenza

Ron Wohrle, DVM
Washington Department of Health
Topic

- Highly Pathogenic Avian Influenza (HPAI) H5N1 mammals
- HPAI H5N1 domestic animals/pets
What animals can be infected with avian influenza A (H5N1) viruses?
<table>
<thead>
<tr>
<th>Genus species</th>
<th>Common Name</th>
<th>Wild</th>
<th>Captive/Sanctuary</th>
<th>Pet</th>
<th>Lab</th>
<th>Mortality</th>
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</thead>
<tbody>
<tr>
<td><em>Chrotogale owstoni</em>¹</td>
<td>Owston Palm Civet</td>
<td></td>
<td>+</td>
<td></td>
<td></td>
<td>+</td>
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<tr>
<td><em>Felis domestica</em>²</td>
<td>Domestic/feral cat</td>
<td>+</td>
<td></td>
<td>+</td>
<td>+</td>
<td>+</td>
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<tr>
<td><em>Macaca fascicularis</em>³</td>
<td>Cynomolgus macques</td>
<td></td>
<td>+</td>
<td></td>
<td></td>
<td>-</td>
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<tr>
<td><em>Martes foina</em>⁴</td>
<td>Stone (beech) marten</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td>+</td>
</tr>
<tr>
<td><em>Mustela putorisi furo</em>⁵</td>
<td>Ferret</td>
<td></td>
<td>+</td>
<td></td>
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<td>+</td>
</tr>
<tr>
<td><em>Oryctolagus cuniculus</em>⁶</td>
<td>New Zealand white rabbit</td>
<td></td>
<td>+</td>
<td></td>
<td></td>
<td>-</td>
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<tr>
<td><em>Panthera pardus</em>⁷</td>
<td>Leopard</td>
<td></td>
<td>+</td>
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<td>+</td>
</tr>
<tr>
<td><em>Panthera tigris</em>⁷</td>
<td>Tiger</td>
<td></td>
<td>+</td>
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<td><em>Rattus norvegicus</em>⁶</td>
<td>Rat</td>
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<td>-</td>
</tr>
<tr>
<td><em>Sus domesticus</em>⁸</td>
<td>Pig</td>
<td></td>
<td>+</td>
<td>+</td>
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</tr>
</tbody>
</table>

What about infection in large cats, like tigers?
Can domestic cats be infected with avian influenza viruses?
Question

How commonly have cats been infected with avian influenza A (H5N1) viruses?

A. Very commonly
B. Somewhat commonly
C. Rarely
D. Never
How have cats become infected with avian influenza A (H5N1) viruses?
Can cats spread H5N1 to people?

What is the risk to humans or other species from cats infected with avian influenza H5N1 virus?
The current risk that cats in the United States will become infected with influenza A (H5N1) is close to 0%.

A. True

B. False
Can dogs be infected with avian influenza?
Questions?