Avian Influenza:
Putting the risks in perspective
What is Avian Influenza?

• Influenza virus adapted to birds
• Rated by ability to cause disease in chickens (high vs low pathogenic)
• Rated by virus makeup (H and N)
• Subtypes and strains “clades”
Neuraminidase “N” (9 variants)
Hemagglutinin “H” (16 variants)
RNA (Orthomyxovirus)
M₂ protein (only on type A)
Influenza A can (& does) mutate
(antigenic drift & sudden antigenic shift)
Swine are a “mixing vessel”

- Genetic reassortment can produce a pandemic strain.
### Avian Influenza

**Planning and Preparing**

<table>
<thead>
<tr>
<th>Distribution of Influenza A Hemagglutinin Subtypes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>human beings</strong></td>
</tr>
<tr>
<td>H1</td>
</tr>
<tr>
<td>H2</td>
</tr>
<tr>
<td>H3</td>
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<td>H4</td>
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<td>H13</td>
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<td>H14</td>
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<tr>
<td>H15</td>
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</tbody>
</table>

- Influenza A virus subtypes are most diversified in birds.
- Limited number of subtypes infect humans and other mammals.
How is Avian Influenza Different from Human Influenza?

- Seasonal human influenza
- Avian influenza (SE Asian H5N1)
- Pandemic human influenza
Why is SE Asian H5N1 Strain Important?

- Emerged in Hong Kong poultry (1997)
- Human illness
- Circulated throughout SE Asia
- 2005 – spread to Asia
- 2006 – spread to Europe, Africa
- Remains highly pathogenic in birds
How will H5N1 influenza spread?
What are the risks – to poultry?

• High morbidity and mortality

• “Reportable” to CFIA

• Eradication of flocks infected with H5/H7 or any highly pathogenic variety
How does Manitoba differ from Thailand?

<table>
<thead>
<tr>
<th></th>
<th>Thailand</th>
<th>Manitoba</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land mass</td>
<td>0.5 M sq km</td>
<td>0.5 M sq km</td>
</tr>
<tr>
<td># people</td>
<td>62 M</td>
<td>1.1M (1/60th)</td>
</tr>
<tr>
<td># birds</td>
<td>280 M</td>
<td>9 M (1/30th)</td>
</tr>
<tr>
<td># flocks</td>
<td>2.9 M</td>
<td>2.8 K (1/1000th)</td>
</tr>
</tbody>
</table>
- Evaluate five routes of spread.
- Only province to publish an assessment.

Route 1: Classic Spread from Wild Waterfowl

<table>
<thead>
<tr>
<th>Impact</th>
<th>Very High</th>
<th>High</th>
<th>Moderate</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Devastating</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Severe</td>
<td></td>
<td>Turkey Breeding</td>
<td>Laying Hen Broiler Breeder</td>
<td>Broiler chicken</td>
</tr>
<tr>
<td>Noticeable</td>
<td></td>
<td>Turkey Commercial</td>
<td>Layer Breeder</td>
<td>Geese</td>
</tr>
<tr>
<td>Minor</td>
<td></td>
<td></td>
<td></td>
<td>Backyard Mix</td>
</tr>
</tbody>
</table>

Probability of Occurrence once in 20 Years

http://www.gov.mb.ca/ agriculture/ livestock/anhealth/jaa00s00.html
Overview of Manitoba Initiatives

• Prevention
  – Biosecurity
    • commercial and backyard
  – Enhanced surveillance
    • early warning in commercial, backyard, wild birds
Overview of Manitoba Initiatives

• Preparedness
  – Vulnerability Assessment
  – Biosecurity & personal protection training for staff
  – GIS tools
  – Multiple veterinary-human health interactions
    • Zoonotic Diseases Committee
    • Federal-provincial Avian Influenza Steering Committee in MB
    • Federal-provincial zoonotic and influenza committees
    • CVO and CMOH interactions
Overview of Manitoba Initiatives

• Response
  – FADES agreement with CFIA, joint action plans
  – Preplanning disposal options
  – Joint fed-prov communications planning
  – Enhanced laboratory capacity
  – Emergency operations centre
  – Strengthened legislation
  – Multiple partners engaged in disease control strategy
Overview of Manitoba Initiatives

• Recovery
  – Proactive recovery committee
  – Coordinating with producer and processor representatives
  – Social well-being issues
Final Thoughts

• Poultry producers are doing their part

• Poultry meat is safe to eat

• The risk to people is very small