This information is pulled from some presentations given by poultry science faculty on avian influenza, past outbreaks, disease symptoms, response to the disease. In addition, there is information on reporting flocks with high mortality or other symptoms.

Avian Influenza

Ounce of prevention better than a pound of cure

Brian Fairchild
Extension Poultry Scientist
University of Georgia
Primary Message Now is Prevention

- Biosecurity

STOP
THIS IS A BIOSECURE AREA
No Unauthorized Entry

Go to office located at  ______________
Or call ____________ at phone number ____________
Avian Influenza

- Caused by a virus
- Many different strains
- Named after proteins on their envelope
- H for Hemagglutinin (1-16)
- N for Neuraminidase (1-9)

### HPAI Strains

<table>
<thead>
<tr>
<th>Number</th>
<th>Year</th>
<th>Country/Region</th>
<th>Strain</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1959</td>
<td>Scotland</td>
<td>H5N1</td>
</tr>
<tr>
<td>2</td>
<td>1961</td>
<td>South Africa</td>
<td>H5N3</td>
</tr>
<tr>
<td>3</td>
<td>1963</td>
<td>England</td>
<td>H7N3</td>
</tr>
<tr>
<td>4</td>
<td>1966</td>
<td>Canada</td>
<td>H5N9</td>
</tr>
<tr>
<td>5</td>
<td>1975</td>
<td>Australia</td>
<td>H7N7</td>
</tr>
<tr>
<td>6</td>
<td>1979</td>
<td>Germany</td>
<td>H7N7</td>
</tr>
<tr>
<td>7</td>
<td>1979</td>
<td>England</td>
<td>H7N7</td>
</tr>
<tr>
<td>8</td>
<td>1983-84</td>
<td>USA</td>
<td>H5N2</td>
</tr>
<tr>
<td>9</td>
<td>1983</td>
<td>Ireland</td>
<td>H5N8</td>
</tr>
<tr>
<td>10</td>
<td>1985</td>
<td>Australia</td>
<td>H7N7</td>
</tr>
<tr>
<td>11</td>
<td>1991</td>
<td>England</td>
<td>H5N1</td>
</tr>
<tr>
<td>12</td>
<td>1992</td>
<td>Australia</td>
<td>H7N3</td>
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<tr>
<td>13</td>
<td>1994</td>
<td>Australia</td>
<td>H7N3</td>
</tr>
<tr>
<td>14</td>
<td>1994-95</td>
<td>Mexico</td>
<td>H5N2 **</td>
</tr>
<tr>
<td>15</td>
<td>1995 and 2004</td>
<td>Pakistan</td>
<td>H7N3 **</td>
</tr>
<tr>
<td>16</td>
<td>1997</td>
<td>Australia</td>
<td>H7N4</td>
</tr>
<tr>
<td>17</td>
<td>1997</td>
<td>Italy</td>
<td>H5N2</td>
</tr>
<tr>
<td>18*</td>
<td>1996-2015</td>
<td>Eurasia/Africa</td>
<td>H5N1</td>
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<tr>
<td>19</td>
<td>1999-2000</td>
<td>Italy</td>
<td>H7N1</td>
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<td>20</td>
<td>2002</td>
<td>Chile</td>
<td>H7N3</td>
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<tr>
<td>21</td>
<td>2003</td>
<td>Netherlands</td>
<td>H7N7</td>
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<tr>
<td>22</td>
<td>2004</td>
<td>USA</td>
<td>H5N2</td>
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<tr>
<td>23</td>
<td>2004</td>
<td>Canada</td>
<td>H7N3</td>
</tr>
<tr>
<td>24</td>
<td>2004</td>
<td>South Africa</td>
<td>H5N2 (ostriches)</td>
</tr>
<tr>
<td>25</td>
<td>2005</td>
<td>North Korea</td>
<td>H7N7 **</td>
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<tr>
<td>26</td>
<td>2006</td>
<td>South Africa</td>
<td>H5N2 (ostriches)</td>
</tr>
<tr>
<td>27</td>
<td>2007</td>
<td>Canada</td>
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<td>Spain</td>
<td>H7N7</td>
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<tr>
<td>30</td>
<td>2011-13</td>
<td>South Africa</td>
<td>H5N2 (ostriches)</td>
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<tr>
<td>31</td>
<td>2012</td>
<td>Chinese Taipei</td>
<td>H5N2</td>
</tr>
<tr>
<td>32</td>
<td>2012-15</td>
<td>Mexico</td>
<td>H7N3 **</td>
</tr>
<tr>
<td>33</td>
<td>2012</td>
<td>Australia</td>
<td>H7N7</td>
</tr>
<tr>
<td>34</td>
<td>2013</td>
<td>Italy</td>
<td>H7N7</td>
</tr>
<tr>
<td>35</td>
<td>2013</td>
<td>Australia</td>
<td>H7N2</td>
</tr>
</tbody>
</table>

David Swayne, USDA-ARS
Avian Influenza

- Caused by a virus
- Named after proteins on their envelope
- H for Hemagglutinin (1-16)
- N for Neuraminidase (1-9)
- In waterfowl, usually cause no disease
- In gallinaceous birds,
  - cause mild disease (LPAI)
  - to severe catastrophic disease (HPAI)
- HPAI is a foreign animal disease
- AI has an incubation period of 3-7 days
  - Depending on
Avian Influenza

- AI has an incubation period of 3-7 days
- Depends on
  - Viral dose
  - Poultry species
  - Route of exposure
Avian Influenza

- Two types based on ability to produce the disease (pathogenicity)
  - Low Path AI
    - commonly occurs in wild birds. In most cases, it causes minor symptoms or no noticeable symptoms. It is rarely fatal in birds.
  - High Path AI
    - fatal in chickens and turkeys. HPAI spreads rapidly and has a high death rate
Avian Influenza

- This virus does not affect humans
- Public Health Department will be monitoring
- AI viruses can change and adapt
- Concern is paralysis of the industry, loss of production and trade
History of HPAI in the US

- 1983 - Large outbreak PA: Destruction of 17M chickens
- 1983 - Single flock in TX
- 2014-2015 – Large outbreak with confirmed cases in WA, OR, CA, ID, MT, AR, MO, MN, IA, SD, ND, WI, ND, NE, IN
- 2016 – Confirmed cases in IN in turkeys
- 2017 – A confirmed case in TN on a broiler breeder farm
Avian Influenza

- Virus does not infect humans
- Poultry meat and egg products are safe to eat...
- Even during an AI outbreak
- Why?
  - No meat or eggs from infected flocks leave the farm
  - Cooking kills the virus
Economic Impact

- **Minnesota**
  - Estimate impact on state economy – greater than $650 million
  - Affected 2,500 jobs
  - Estimated $170 million loss in wages
Economic Impact

- Iowa
  - $427,000
    - Income, egg sales, grain sales
  - 8,500 jobs affected
Economic Impact

- Georgia

Economic Impact of the Chicken Industry in Georgia

<table>
<thead>
<tr>
<th></th>
<th>Direct</th>
<th>Supplier</th>
<th>Induced</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jobs (FTE)</td>
<td>47,911</td>
<td>72,223</td>
<td>32,651</td>
<td>152,785</td>
</tr>
<tr>
<td>Wages</td>
<td>$2,597,656,000</td>
<td>$4,360,942,800</td>
<td>$1,514,633,000</td>
<td>$8,473,231,800</td>
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<tr>
<td>Economic Impact</td>
<td>$24,193,016,800</td>
<td>$16,126,985,800</td>
<td>$4,488,094,800</td>
<td>$44,808,097,400</td>
</tr>
</tbody>
</table>
Avian Influenza Symptoms

- Lack of energy and appetite
- Decreased egg production and/or soft-shelled or misshapen eggs
- Swelling of the head, eyelids, comb, wattles, and hocks
- Purple discoloration of the wattles, combs, and legs

Purple discoloration of comb & wattles
Swelling of head, face, comb and wattles
Avian Influenza Symptoms

- Depression, reduced vocalizations
- Nasal discharge, coughing, sneezing
- Stumbling or falling down
- Diarrhea
- Sudden death without any clinical signs
There are no acceptable or practical treatments for AI
How is HPAI controlled

- **Stamping out**
  - Infected flocks quarantined and destroyed
  - Prevent infection to other flocks

- **Vaccination (USDA decision)**
  - No vaccine match
  - Paralyzes exports
  - Interferes with surveillance
  - Vaccine does not stop virus spread
  - If vaccine use, it will be to help with eradication
Testing for AI

- **GA Testing volume:** 300,000/yr
- **ACTIVE SURVEILLANCE:**
  - Under NPIP:
    - all broiler flocks are testing before processing
    - broiler Breeders every 4-12 weeks
    - layer flocks 2-3 times in their life time
- **Auction and Sales:** random testing
- **PASSIVE SURVEILLANCE:** All birds submitted to the lab for any reason are tested
## State Response Plan

### 1. Immediate response (first case)
   1. Activation of Committee and GIS
   2. REPORTING

### 2. Indemnity

<table>
<thead>
<tr>
<th>AFFECTED FLOCK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quarantine</td>
</tr>
<tr>
<td>Euthanasia</td>
</tr>
<tr>
<td>Disposal</td>
</tr>
<tr>
<td>C&amp;D</td>
</tr>
<tr>
<td>Security and Biosecurity</td>
</tr>
</tbody>
</table>

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*Georgia Poultry Laboratory Network*
State Response Plan

1. Immediate response (first case)
   1. Activation of Committee and GIS
   2. REPORTING

2. Indemnity

<table>
<thead>
<tr>
<th>AFFECTED FLOCK</th>
<th>SURROUNDING FLOCKS</th>
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</thead>
<tbody>
<tr>
<td>Quarantine</td>
<td>Monitoring by priorities and Zones</td>
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<tr>
<td>Euthanasia</td>
<td>Disposal</td>
</tr>
<tr>
<td></td>
<td>Movement Control</td>
</tr>
<tr>
<td></td>
<td>C&amp;D</td>
</tr>
</tbody>
</table>

Security and Biosecurity

Georgia Poultry Laboratory Network
Zones

Control and surveillance

Georgia Poultry Laboratory Network
Biosecurity for Flocks

- Prevent contact with waterfowl & wild birds
- Establish good rodent control programs
- Routine cleaning and sanitation of coop
- Have designated clothes and shoes for entering coop or working with your flock
Biological Vectors
Biosecurity for Flocks

- **Hunters**
  - Dress your game birds in the field whenever possible
  - If you must dress birds at home, clean them in an area your poultry and pet birds cannot access
  - Use dedicated tools for cleaning game, whether in the field or at home
  - Always wear rubber gloves when cleaning game
  - Double bag the offal and feathers. Tie the inner bag, and be sure to take off your rubber gloves and leave them in the outer bag before tying it closed.
  - Place the bag in a trash can that poultry and pet birds cannot access.
Primary Message Now is Prevention

- Biosecurity

**STOP**

THIS IS A BIOSECURE AREA

No Unauthorized Entry

Limit visitors

Go to office located at ______________
Or call ____________ at phone number ____________
Points to take away from this

1. We need to initiate BIG change—Biosecurity/Prevention
2. This is not a human virus, it is an avian virus
3. Poultry products are safe to consume
4. Water fowl are carriers and efforts should be made to minimize them from grazing near poultry facilities
5. Georgia is prepared to handle it, but with proper biosecurity, hopefully we won’t have to
Small Flock Avian Influenza Triage
County Extension Office

A. Bruce Webster
Department of Poultry Science
The University of Georgia
Early Discovery/Early Eradication

• Highly pathogenic avian influenza is classified as a Foreign Animal Disease.
  – FAD triggers federal response
    • USDA APHIS, in cooperation with GA Dept. Agriculture
• USDA goal is to depopulate infected flock within 24 hours of detection.
  – Early discovery is essential to minimize risk of virus escape from infected premise.
• County extension offices are on the front line of the avian influenza defense effort.
• What to do with calls about sick birds?
  – Small poultry flocks (backyard flocks)
  – Wild birds
Early Discovery/Early Eradication

• Most calls will be about other issues.
  – Bird problems related to nutrition, management, or other infectious or non-infectious diseases.

• Need triage system to sort out cases.
  – Possible cases of A.I. must be reported to Georgia Poultry Lab Network (GPLN).
  – Don’t want to miss a case.
Signs of Avian Influenza
(In order of importance)

- Sudden death without clinical signs.
- Swelling of the head, eyelids, comb, wattles & hocks.
- Purple discoloration of wattles, combs & legs.
- Coughing, sneezing.
- Lack of coordination, paralysis.
- Nasal discharge.
- Diarrhea.
- Lack of energy & appetite.
- Ruffled feathers.
- Decreased egg production.
- Soft-shell or misshapen eggs.

- Problem: Many poultry diseases have similar symptoms and some symptoms may be caused by poor feeding or management.
How to tell if it is A.I.

• Avian influenza will impact most of a flock quickly.
• Birds will probably show several of the signs of A.I.
Triage

- Record species involved.
- Review A.I. signs with caller.
- Record which signs are evident.
- Record number or % of birds showing signs.
Triage Decisions

• If the problem is chronic, i.e., has lasted more than a week. –Not A.I.
• If there was a problem but flock recovered. –Not A.I.
• If only one bird is sick, e.g., lethargy, ruffled feathers, or dead, but rest of flock continues to be healthy. –probably not A.I.
  – Refer client to Georgia Poultry Lab Network: (770) 766-6810.
• If decrease in egg production but birds otherwise appear normal. –probably not A.I.
  – Contact UGA Poultry Science Extension.
Triage Decisions

• If the problem is chronic, i.e., has lasted more than a week. – Not A.I.
• If there was a problem but flock recovered. – Not A.I.
• If only one bird is sick, e.g., lethargy, ruffled feathers, or dead, but rest of flock continues to be healthy. – probably not A.I.
  – Refer client to GPLN (770) 766-6810.
• If decrease in egg production but birds otherwise appear normal. – probably not A.I.
  – Contact UGA Poultry Science Extension.
• If sudden death, especially of multiple birds, or more than 10% of flock shows signs. – possible A.I.
  – Advise flock owner and get contact information.
  – Call GPLN Avian Influenza Hotline (770) 766-6850.
• If in doubt
  – Call GPLN A.I. Hotline
Possible A.I.

- Get flock owner’s name, address, phone number.
- Advise owner.
  - Urge biosecurity
    - Refer to USDA Biosecurity for Birds website.
  - Inform that GA Dept. Ag. or USDA representative may be in touch to get samples from birds.
  - Reassure that if A.I. is confirmed, USDA has indemnification program to reimburse value of birds having to be euthanized.
    - Mention that time is of the essence because birds that die on their own cannot be indemnified.
- Call Georgia Poultry Lab Network Hotline.
  - (770) 766-6850
  - Work through symptom scoring interview.
Wild Birds

• Wild birds are handled by the Georgia Department of Natural Resources, Wildlife Resources Division.

• If you get a call about deaths or illness in wild birds, particularly if multiple birds involved.
  – Contact GA DNR Game Management Specialist in your region. (Phone numbers on next slide)

• For more information see: UGA CAES publication, “How to handle dead birds or dead bird inquiries.”
UGA Extension Avian Flu Webpage

  • Has links to A.I. information, e.g.,
    – Biosecurity for Birds
    – How to Handle Dead Birds or Dead Bird Inquiries
# Small Flock A.I. Questionnaire

<table>
<thead>
<tr>
<th>Question</th>
<th>Possible Answers</th>
</tr>
</thead>
<tbody>
<tr>
<td>How long has the problem been going on?</td>
<td>Just started / More than a few days</td>
</tr>
<tr>
<td>How many birds involved?</td>
<td>One or two / 10% or more of flock</td>
</tr>
<tr>
<td>Sudden death without clinical signs?</td>
<td>Yes ... (get number or % of birds) / No</td>
</tr>
<tr>
<td>Swelling of head, eyelids, comb, wattles, hocks?</td>
<td>Yes ... (get number or % of birds) / No</td>
</tr>
<tr>
<td>Purple discoloration of wattles, combs, legs?</td>
<td>Yes ... (get number or % of birds) / No</td>
</tr>
<tr>
<td>Coughing, sneezing?</td>
<td>Yes ... (get number or % of birds) / No</td>
</tr>
<tr>
<td>Lack of coordination, paralysis?</td>
<td>Yes ... (get number or % of birds) / No</td>
</tr>
<tr>
<td>Nasal discharge?</td>
<td>Yes ... (get number or % of birds) / No</td>
</tr>
<tr>
<td>Diarrhea?</td>
<td>Yes ... (get number or % of birds) / No</td>
</tr>
<tr>
<td>Lack of energy &amp; appetite?</td>
<td>Yes ... (get number or % of birds) / No</td>
</tr>
<tr>
<td>Ruffled feathers?</td>
<td>Yes ... (get number or % of birds) / No</td>
</tr>
<tr>
<td>Decreased egg production?</td>
<td>Yes ... (get number or % of birds) / No</td>
</tr>
<tr>
<td>Soft-shell or misshapen eggs?</td>
<td>Yes ... (get number or % of birds) / No</td>
</tr>
</tbody>
</table>
In the event....

If you have any suspicion...

Do not hesitate...

• Avian influenza Hot-line ....770-766-6850