Pro-poor HPAI Reduction Strategies Project
Ethiopia Risk assessment Multi-Stakeholder Workshop

Background information: Poultry sectors and disease status

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September 25th -26th, 2008, ILRI, Addis Ababa
Poultry production system
Livestock sector

- About 18.8% of national GDP and 40% of the agriculture GDP (FAO, 2004)

- Poultry (Chicken) population: estimated at 34.2 million (CSA, 2007)

- 94.44% native breed, 3.92% hybrid breed, 0.64% exotic breed (CSA, 2007)
Tigray, Amhara, Oromia and SNNPR regions present the higher poultry densities.

Source: Serge Nzietchueng, 2007, CSA 2007
## Three poultry production systems

<table>
<thead>
<tr>
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<th>Bio-security</th>
<th>Localization</th>
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<tbody>
<tr>
<td>Backyard</td>
<td>Minimal</td>
<td>All the country</td>
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<tr>
<td>Small commercial</td>
<td>Minimal to low</td>
<td>Debre Zeit town (Oromia region) and Addis Ababa</td>
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<tr>
<td>farm</td>
<td></td>
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<tr>
<td>Large commercial</td>
<td>Medium to high</td>
<td>Debre Zeit Oromia region</td>
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<tr>
<td>farm</td>
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Trade flow of poultry and poultry products in Ethiopia

Source: Goutard & Magalhaes, 2006
No specific routes for chicken trade

Source: Serge Nzietchueng, 2007
Disease status
Backyard

- Parasitism (gastrointestinal helminths), prevalence: 91.01% (Eshetu et al., 2001)
- Marek’s disease, prevalence: 72.9% (Duguma et al., 2005)
- Newcastle disease, prevalence: 32.22% (Tadesse et al., 2005)
- Coccidiosis, prevalence: 25.8% (Ashenafi et al., 2004)

Small commercial farm

- Coccidiosis

Commercial farm

- Marek’s disease
- Gumboro disease
- Coccidiosis

Risk for introduction of HPAI H5N1 virus into Ethiopia exist
Ways for introduction of HPAI H5N1 virus into Ethiopia
Legal trade

- Importation: DOC, HE,…
- Poultry equipments (Incubator, Feeding, Watering, Cage)
- Poultry products (Egg, meat,…)
- At the border (Sudan, Djibouti, Eritrea).

Illegal trade

- Small traders at the border with Sudan, Djibouti, Eritrea.

Wild migratory wild bird

Travellers from infected countries
Risk questions

What is the risk of introduction of HPAI H5N1 virus into Ethiopia by...
Legal trade

- Importation: DOC, HE, … Q1
- Poultry equipments (Incubator, Feeding, Watering, Cage, …) Q2
- Poultry products (Egg, meat, …). Q3
- At the border (Sudan, Djibouti, Eritrea) Q4.

Illegal trade

- Smalls trader at the border with Sudan, Djibouti, Eritrea. Q5

Wild migratory wild bird Q6

Travellers from infected countries Q7
What has been already done
Qualitative risk assessment of introduction and dissemination of HPAI H5N1 virus into Ethiopia by the migratory wild birds
(Goutard and al, 2007)

**Risk question**: What is the risk of introduction and dissemination of HPAI H5N1 virus into Ethiopia by the migratory wild birds

**Time frame**: European winter (December-February)

**Pathways**
Congregation sites: lakes, swamps

Migratory waterbirds
Eurasian/African species

Residents waterbirds
African species

Contamination through water/environment

Backyard chicken

Contamination through water/environment

Commercial or governmental farms
Probability that infected wild water migratory birds enter an Ethiopian congregation site

- Source population of migratory birds
  - Probability to be infected by H5N1
  - Population infected by H5N1
  - Probability to survive infection and to reach congregation sites
  - Population infected by H5N1 reaching congregation sites
Exposure and consequences assessment

Probability that the infection become endemic in resident wild water birds in Ethiopia

Population infected by H5N1 reaching congregation sites → Probability to be in contact with resident wild water birds → Population in contact with infected migratory birds

Population in contact with infected migratory birds → Probability to be infected by the virus → Population of resident water birds infected by H5N1

Population of resident water birds infected by H5N1 → Probability to survive infection → Population of resident water birds infected by H5N1 surviving the infection
Exposure and consequences assessment

Probability that domestic poultry in Ethiopia become infected by H5N1 HPAI after wild bird infection

- Population of resident water birds infected by H5N1 surviving the infection
- Probability to be in contact with domestic poultry
- Population of domestic poultry in contact with infected birds
- Probability to be infected by the virus
- Population of domestic poultry infected by H5N1
Qualitative risk assessment of the introduction of the HPAI H5N1 virus into Ethiopia via formal and informal importation of poultry

(Olive and al,2007)

**Risk question**: What is the risk of introduction of HPAI H5N1 virus into Ethiopia via formal and informal importation of poultry


**Pathways**
Quantitative assessment of the risk for introduction of HPAI H5N1 virus into Ethiopia via the legal trade of Day-old-chicks (Soares and al, 2007)

**Risk question**: What is the risk of introduction of HPAI H5N1 virus into Ethiopia commercial farm via the legal import of day-old-chicks

**Time frame**: January-December

**Pathways**
a) Pathways involved in the release

b) Pathways involved in the exposure
Do we need to update these Risk assessments?
Thank you

Q&R