Causes of Mortality in Backyard Poultry in Eight States in the United States

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Kyran J. Cadmus, Ash Mete, Macallister Harris, Doug Anderson, Sherrill Davison, Yuko Sato, Julie Helm, Lore Boger, Jenee Odani, Martin D. Ficken, Kristy L. Pabilonia

Abstract. A comprehensive understanding of common diseases of backyard poultry flocks is important to providing poultry health information to flock owners, veterinarians, and animal health officials. We collected autopsy reports over a 3-y period (2015–2017) from diagnostic laboratories in 8 states in the United States; 2,509 reports were collected, involving autopsies of 2,687 birds. The primary cause of mortality was categorized as infectious, noninfectious, neoplasia or lymphoproliferative disease, or undetermined. Neoplasia or lymphoproliferative disease was the most common primary diagnosis and involved 42% of the total birds autopsied; 63% of these cases were diagnosed as Marek’s disease or leukosis/sarcoma. Bacterial, parasitic, and viral organisms were commonly detected, involving 42%, 28%, and 7% of the birds autopsied, respectively, with 2 or more organisms detected in 69% of birds. Our findings demonstrate the importance of educating flock owners about disease prevention and biosecurity practices. The detection of zoonotic bacteria including paratyphoid salmonellae, Campylobacter spp., Listeria monocytogenes, and Mycobacterium avium, and the detection of lead and other heavy metals, indicate public health risks to flock owners and consumers of backyard flock egg and meat products.
Methods

- 8 participating states
- Submitted necropsy reports from 2015-17
  - 2,509 accessions
  - 2,687 birds
  - 96% chickens, 85.2% hens
- Categorized into a primary cause of mortality, then subcategorized
- More than one cause of mortality reported in 69.1% of birds
A pie chart showing the following categories:

- Neoplastic/lymphoproliferative disease: 42.1%
- Infectious: 36.1%
- Noninfectious: 17.2%
- Undetermined: 4.6%
Most Common Cause of Mortality

- Neoplasia / lymphoproliferative disease (42.1%)
  - Marek’s disease or leukemia/sarcoma group diseases - 63.4%
    - 50.2% were <1 year of age
  - Ovarian adenocarcinoma / carcinomatosis – 27.8%
Infectious Diseases

- **Bacterial (42.2%)**
  - E. coli - 34%
  - Mg/Ms - 26.1%
  - Associated repro disease - 30%

- **Viral (7.3%)**
  - IBV - 41.5%
  - ILT - 20%
  - Pox - 20%
Infectious Diseases

- Parasitic
  - Primary cause of mortality – 2.6%
  - Most common secondary finding – 25.5%
Other Causes of Disease

- Generalized noninfectious diseases (16.5%)
  - Hemorrhagic liver syndrome – 29.5%
  - Cardiovascular diseases – 17.6%
  - Gout – 14%

- Nutritional and management diseases (9.7%)
  - Typically multiple disease issues related to management diagnosed – 94.6%
Table 2. Causes of backyard bird mortality \((n = 2,687)\) in 8 states during 2015–2017.

<table>
<thead>
<tr>
<th>Category</th>
<th>No. of birds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bacterial</td>
<td>1,135</td>
</tr>
<tr>
<td>Neoplastic/lymphoproliferative</td>
<td>1,131</td>
</tr>
<tr>
<td>Parasitic</td>
<td>755</td>
</tr>
<tr>
<td>Generalized noninfectious</td>
<td>444</td>
</tr>
<tr>
<td>Nutritional/management/environmental</td>
<td>261</td>
</tr>
<tr>
<td>Viral</td>
<td>195</td>
</tr>
<tr>
<td>Undetermined</td>
<td>123</td>
</tr>
<tr>
<td>Fungal</td>
<td>114</td>
</tr>
<tr>
<td>Traumatic</td>
<td>96</td>
</tr>
<tr>
<td>Toxic</td>
<td>41</td>
</tr>
<tr>
<td>Developmental</td>
<td>40</td>
</tr>
</tbody>
</table>

Concurrent disease was diagnosed in 69.1% of birds autopsied; thus, total numbers within the diagnosis categories exceeds number of birds autopsied per year.
Public Health Concerns

- Zoonotic bacteria (1.6%)
  - Paratyphoid salmonellae
  - *Mycobacterium avium*
  - *Listeria monocytogenes*
  - *Campylobacter jejuni*

- Lead and other heavy metals

- Botulism (one case)
How are we helping?

- All states provide BYF poultry services
- Reduced pricing diagnostics – 3/8 states
- BYF field services – 3/8 states
- Free AIV and NDV testing – 7/8 states