Avian Influenza in California
High-Path H5N8

Stanislaus County Incident
January 2015

Kings County Incident
February 2015

Victor Velez
Overview of HPAI Response

• Cooperative involvement of CDFA and USDA
• Detection
• Containment – Quarantine and Control Movement
• Response Planning
• Eradication - Depopulation
• Surveillance
• Outreach and Education
• Disposal - Composting
• Cleaning and Disinfection
• Repopulation
• Quarantine release
Detection of HPAI – Jan. 2015

- 21 JAN 2015
  - Stanislaus County, California commercial turkey flock experienced increased mortality.
  - Flock veterinarian submitted samples immediately to the California Animal Health and Food Safety (CAHFS) Laboratory.
- 22 JAN 2015
  - CAHFS reported positive AI matrix gene results
  - Submitted the samples to NVSL for confirmatory testing
  - Premises was immediately quarantined based on presumptive results
- 23 JAN 2015
  - NVSL confirmed H5N8 HPAI, the partial HA/NA sequence is >99% identical to A/Gyrfalcon/WA/41088-6/2014 based on direct sequence attempts from 2 swabs
  - NVSL reported that oropharyngeal swabs tested by rRT-PCR were positive for influenza A virus (IAV)
  - Results were positive for HPAI H5N8.
Incident Response

- Infected premises (IP) immediately quarantined
- Incident Command Post (ICP) established – USDA/CDFA
- 3 km Infected Zone established around IP
- 7 km Buffer Zone providing a 10 km Control Area
- 10 – 20 km Surveillance Zone from IP
- ICP populated with USDA/CDFA personnel
  - Stanislaus Co. Ag Commissioner, OES, CDPH, CDPR, Law enforcement
Incident Command System (ICS) Organizational Structure
Quarantine

• California Food and Agricultural Code
  – Division 5, Part 1, Chapter 3, Article 1, section 9561 – 9574 provides State Veterinarian overall quarantine authority

A quarantine was placed on the affected Stanislaus County premises based on presumptive results.
Movement controls

- Permit system instituted for movement of feed/birds/whatever on or off the quarantined premises.
- Includes any premises (commercial or non-commercial) inside the control area.
- Tracking system for permits maintained by CDFA
Affected Premises Security

- Private security company employed to ensure strict biosecurity and prevent any visitors from access to affected premises

- On duty 24/7 through the depopulation process and first week of the composting process
Health and Safety of Personnel

• Health and Safety of Responders always primary objective
• Oversight by Safety Officer in ICP
• Required appropriate personal protective equipment (PPE). N-95 respirator, eye protection, Tyvek suit, gloves, rubber boots, hair net, hard hat.
• Driving is a significant safety issue. Use defensive driving techniques. Be aware of fog and other driving hazards. Allow enough time to reach destination.
• Practice proper on-farm biosecurity
• Stay hydrated
Epidemiology - Stanislaus County

- Three growing houses
  - A, B and Brooder
- 24 houses in the complex
- 143,000 turkeys
- 2 additional commercial premises in Control Area placed under quarantine*
- 11 Backyard premises under quarantine in Control Area*
- 23 commercial premises in Surveillance Zone sampled twice*
- 53 BY premises in Surveillance Zone sampled once*
- Biosecurity enhanced at all poultry premises

* No additional infection found on any of these tested premises
Epidemiology - Kings County

- 7 populated houses
- 78,000 chickens
- 35,000 ducks
- 5 additional commercial premises in Control Area*
- 83 BY premises under quarantine in Control Area*
- 10 commercial premises in Surveillance Zone sampled twice*
- 87 BY premises in Surveillance Zone sampled once*
- Biosecurity enhanced at all poultry premises
- Company distributes into the LBM System – 20 traces

* No additional infection found on any of these tested premises
Approximately 180 km between affected commercial poultry operations
Why Immediate Detection and Containment Matters
Epidemiology - Wildlife

• The poultry company complex is remotely located with proximity to several bodies of water that attracts various species of waterfowl, which then feed in local grazing pastures.

• Since the confirmation of HPAI at this complex, enhanced biosecurity has been adopted by the company at all of its premises.

• USDA APHIS Wildlife Services did provide wildlife assessment of the affected premises
  – American Widgeon, American Green-winged Teal, Bufflehead, Gadwall, Mallard, Northern Shoveler, and Canada Geese were observed in the natural ponds
USDA APHIS Wildlife Services Assessment

Figure 5.

Figure 6.

Figure 7.
Migratory aquatic birds – also the likely mode for H5N8 HPAI virus spread to North America

Eurasian (EA) H5N8 was likely carried to Alaska by infected birds migrating on the East Asia / Australia Flyway. Within 3 months, HPAI viruses were detected in the Pacific Americas Flyway and the Mississippi Americas Flyway.

EA H5N8 underwent gene reassortment with low pathogenicity avian influenza (LPAI) strains endemic to North American wild birds. This means a bird was co-infected at some point with the H5N8 and an American (AM) LPAI strain, enabling the 8 gene segments to be mixed and matched in new combinations.

EA/AM H5N1 and EA/AM H5N2 isolates in the western and central US were reassortants that contained genes of North American and Eurasian origin.
Education & Outreach

- Education and outreach campaign carried out to enhance passive surveillance and improve biosecurity for all poultry owners in CA.

- Resources available on CDFA website and distributed directly to commercial and hobby bird owners through feed stores, professional and special interest organizations, university outreach networks, youth groups, poultry shows and sales and through door to door campaigns.

- The CAHFS lab system is actively advertising free testing for any poultry with signs of disease.

- Live bird markets and their suppliers in California actively participate in routine biosecurity reviews and certification and avian influenza testing.
Depopulation with HPAI

• Method of depopulation based on a case-by-case basis
  • Foam
  • CO2
  • Cervical dislocation
  • Captive bolt
  • Injectable barbiturate
Water-based-suppression Foam for the Mass Depopulation of Floor-reared Poultry – Current Systems in Use

- University of Delaware (KifCo) High Expansion Foam System
  - Commercial manufacture
  - Cart delivery
  - Low water use

- North Carolina Department of Agriculture Medium Expansion Foam System
  - Component assembly
  - Hose delivery
  - Moderate water use

- National Veterinary Stockpile Contractor

Courtesy – Dr. Darrell Styles – VS-NPIC
Disposal of HPAI

• Method of disposal based on a case-by-case basis
  – Compost
    • In-house
    • Off site
  – Landfill
Composting

• 28 JAN 2015: Compost set in infected house
• 04 FEB 2015: Compost set in all houses completed
• Composting Protocols
  – Lay down windrow 18 inches deep of carbon source
  – Add 15 inch layer of litter and birds
  – Cover with 15 inches of carbon source
  – Repeat to height of 5-7 feet, 30-40% moisture
  – Cover with 24 inches of carbon source
  – Monitor temperatures daily, should reach 135 degrees F
  – Turn after approximately 10 days
  – Keep houses closed to deter scavengers
Cleaning And Disinfection

• C&D oversight provided by CDFA/USDA
• Details of C&D are outlined in the Flock Plan
  – C&D of conveyances (exterior and interior)
  – Thoroughly clean all poultry houses
  – After dry, disinfection
  – When C&D complete, environmental sampling
  – If any H5N8 present, repeat process
  – Repopulation can occur 21 days post C&D
• Disinfectant
  – Virkon S and Advantage 256 are approved disinfectants for use in this HPAI incident.
Overarching Objective for CA HPAI

• Contain H5N8 HPAI virus to affected premises and prevent transmission to commercial or backyard poultry operations

• Mission Accomplished
Thank you!

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Surveillance in Surveillance Zone for Commercial Premises

- Complete a census of all commercial poultry premises in the Surveillance zone.
- Sample all commercial premises in the Surveillance zone at least twice before quarantine is lifted from Infected Premises.
- Collect swabs as described for the control zone: swab 5-dead birds and pool the samples into the collection media. Select the 5 birds from each group of 50 or less daily dead or euthanized sick birds (and for each multiple of 50 or less dead or euthanized sick birds) from each house on the premises.
- Repeat this test protocol once before the quarantine is lifted from Infected Premises, a minimum of 5 days and preferably 21 days apart.
Surveillance on Backyard Poultry Premises in Surveillance Zone

• Complete census of all backyard poultry premises in the Surveillance Zone.
• Complete an Avian Survey Form on each premises.
• Owner/Caretaker to observe the entire flock for signs of HPAI and immediately report any signs to the ICP.
• If HPAI compatible signs are observed or epidemiological links found, collect swabs from the 5-bird pool sample from each 50 dead bird group from each house or premises; flocks or premises with less than 50 birds require one 5-bird pool.
• Backyard poultry premises where birds DO NOT have HPAI compatible signs will be sampled on a case by case basis as determined by information collected on the Avian Survey Form or by owner request to sample flock.
Surveillance in Control Area for Commercial Premises

- **Quarantine** each facility.
- Complete epidemiological investigation.
- **Collect swab samples from each house on each premises every other day, on Monday, Wednesday and Friday, for eight (8) sample days.**
  - Select 5 birds from each group of 50 or less daily dead or euthanized sick birds from each house on the premises, swab each bird and pool into the collection media.
  - If more than 50 dead birds per house, collect 5-bird pool from each multiple of 50 or less dead or euthanized sick birds.
- Premises that test negative in the above sampling regime will continue sampling with the 5-bird pool protocol with a frequency of every seven (7) days.
- Test negative premises that want to move product from the Control Area may be sampled more frequently, depending on the need to ship product, but at a minimum must continue with the 5 bird pool sampling protocol every 7 days. Contact Incident Command Post 2 weeks prior to movement for testing protocol and permit.
Surveillance in Control Area for Backyard Poultry

- **Quarantine** each facility.
- Complete epidemiological investigation.
- If HPAI *compatible signs are observed or epidemiological links* found, collect swabs from the 5-bird pool sample from each 50 dead bird group from each house on the premises; flocks with less than 50 birds require one 5-bird pool.
- Flocks with *no HPAI compatible signs or epidemiological links* found, collect swabs from a representative number of each poultry species in the flock. Use established table to determine the total number of birds to sample on the premises.
- Require a second test if in Infected Zone – 3 weeks apart.
Surveillance

- Established 20 km surveillance zone around both infected premises
  - 34 commercial poultry farms
  - Door to door by grid – xx homes with poultry
  - Immediately conducted extensive outreach through youth groups, feed stores, farm advisors, etc.