Newcastle Disease Virus (NDV) in Double-crested Cormorants

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Newcastle Disease Virus

What is NDV?

- Paramyxovirus - RNA
- Avian Paramyxovirus Type 1
- Contagious viral disease of birds
- One of the most important poultry diseases in the world
- Long lived in environment
Newcastle Disease Virus

Transmission:

• Spread by direct contact with feces or respiratory discharge
• Transferred by fomites: shoes, clothing and equipment
• Incubation is typically 2-15 days
• Many variations- Mild to Severe
Newcastle Disease Virus

Lentogenic

- Low virulent strains mainly found in wildlife
- Cause mild clinical disease with primary involvement in the respiratory tract
- Pathology not remarkable
Newcastle Disease Virus

Mesogenic or Velogenic

- Acute or highly virulent strains cause neurologic deficits, depression, inappetence, muscular tremors, drooping wings, twisting of the head and neck, circling, complete paralysis, and rapid death
Exotic Newcastle Disease Virus in US

- Exotic Newcastle Disease Virus (END) is a reportable foreign animal disease
- Devastating to poultry industry
- Several recent outbreaks in N America
- California 02-03:
  - 2,662 facilities depopulated
  - 4 million birds destroyed
- Speculation- imported fighting bird
Exotic Newcastle Disease Virus in US

Rare prior to 1990
Increasing reports of vNDV in wildlife in N America
1990  Canada Between 5,000 and 10,000 cormorants died
1992  Northern US and Canada 20,000
1997 California 2,000
2012 Saskatchewan 1000
Mostly sub-adults affected
Breeding colonies affected
March - September
Double-crested Cormorants (DCCs) in Florida

Two populations
• *Phalacrocorax auritus* – migratory
• Atlantic and Great Lakes population – 96,000 pair

• *Phalacrocorax auritus floridanus* - resident
• Florida population estimated between 10,000 and 30,000 individuals.
• Gregarious
• Nesting in large colonies with out aquatic birds
Neurotropic Velogenic NDV in DCCs in Florida

• One recorded finding prior to 2010
• 2002 Florida Keys 1 neurologic signs
• Evidence of END in overwintering DCCs in MS and AL
• And resident DCC eggs in FL (2001)- no adults tested positive
Neurotropic Velogenic NDV in DCCs in Florida

- 21 DEC–2010 through 14 JAN 2011
- 2 Rehabilitation Clinics in FL Central Gulf Coast Region
- DCCs with neurologic signs including tremors, torticollis, wing and/or leg paralysis.
- All died or were euthanized.
Neurotropic Velogenic NDV in DCCs in Florida

- END isolated from 7 juvenile and adult DCCS
- Swabs were matrix positive at Bronson Lab and confirmed positive at National Veterinary Services Lab.
- Quarantine set up on the two facilities
Neurotropic Velogenic Newcastle Disease virus in double-crested cormorants in Florida

- Six rehabilitation clinics and one domestic animal facility were examined.
- Samples taken from other avian species at these facilities tested negative.
- Proper biosecurity followed.
- No spread of virus.
Surveillance for neurotropic velogenic NDV in DCCs in Florida

• Determine if NDV is present in migratory population, resident population or both.
• Environmental sampling
• Testing birds with neurologic signs
Surveillance for neurotropic velogenic NDV in DCCs in Florida

- Two DCCs with neurologic signs tested positive
- To date, environmental samples are negative
Raccoon Roundworm Study

*Baylisascaris procyonis*
- Normal intestinal parasite in raccoons
- Dogs are also definitive host
- Previous studies have detected worm in several counties.
- Zoonotic potential
Raccoon Roundworm Study

Examine 30–40 intestinal tracts from each of 67 FL Counties

• Visually inspect for adult roundworm

• Verify with fecal floatation for eggs
Raccoon Roundworm Study

• 780 tracts examined
• 47 counties with samples
• 18 counties with 10+ samples
• 14 counties- testing completed
Raccoon Roundworm Study

- Positive counties:
  - Bay, Broward, Charlotte, Escambia, Hillsborough, Leon, Orange, Pasco, Pinellas