Histomonosis: treatment, prevention and control

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Histomononosis in USA: Turkeys

- Situation: Large Farms (10-50K birds)
- Exposure from off-farm, probably nearby chicken farms
- Outbreaks responsible for destruction of 10-90% of a flock.
- Disease appears usually at 4-5 wks of age.
Lesions of Histomonosomosis in turkeys
Control of Histomononosis in Turkeys

- Treatment of prevention with antibiotics or anticoccidials is not effective
- Prevention with nitarsone (4-nitro-phenyl-arsonic acid) is only partially effective
- Resistance to nitarsone has been demonstrated after long term usage
- Control by management (restriction of movement of birds by physical barriers) generally not practiced in USA.
Histomonososis in broiler breeders

- Farms heavily contaminated with cecal worms (Heterakis gallinarum)
- Outbreaks may cause 10-20% mortality, morbidity, culling, loss of uniformity, lost egg production
- Problem farms have outbreaks in successive flocks, appearing earlier with each flock.
- Some outbreaks documented as early as 3 wks of age
- Lesions more common in ceca, less spectacular than in turkeys, although there are exceptional cases.
Cecal worms are found in most broiler breeder pullet/male flocks in America
Control of histomonosis in broiler breeders

• Early intervention with anthelmintics (fenbendazole, etc).
• Recommend treatment before onset of outbreak, then every 2 wks through 8 wks of age
• Prevention with nitarsone, but this interferes with use of anticoccidials and antibiotics
• Cleanout, disinfection (widely practiced, but no scientific evidence of effectiveness)
Blackhead in chickens:

Chickens 25 days old
Histomonosis in game birds

- Important industry in USA and Europe
- Good income for farmers as alternative to other poultry
- Pheasants, Chukar Partridges, Bobwhite quail, other species
- Some producers rear 500,000 birds/yr for hunting plantations
- Management highly variable
Histomonosis in gamebirds

• Pheasants good carriers, probably responsible for initial introduction of blackhead into USA in 1890s.
• Chukar partridges susceptible, moderate losses. Some producers rear chukars together with pheasants, with significant losses from blackhead disease
• Bobwhite quail; difficult to infect experimentally, sporadic outbreaks, sometimes high mortality
bobwhite quail: case report

- Previous year: A few birds in one flock
- Next year: Significant mortality
Mortality due mostly to cecal lesions (only 3/56 had lesions in liver)
Bobwhite quail:

- Mortality dwindled after intervention with nitarsone in feed. Overall mortality about 10%
- Losses to histomonosisis began in adjacent building, but at low level. Entire farm receiving nitarsone in feed
- Other reports in literature document up to 90% mortality in small flocks.
Prevention/control of Histomonosisis: Management Practices

I. In turkeys, this disease has difficulty in jumping from one building to another and from one part of a building to another where birds are not in direct contact.

This led to the suggestion that growing facilities be subdivided by physical barriers to limit the risk of entire flocks being involved.

II. As always, avoid rearing different species of birds in the same farm, where one is good carrier
Control: Chemotherapy/prevention

- Histomonas: The unique biology sets it apart from other protozoa and bacteria
- Anaerobic, no mitochondria, hydrogenosomes for anaerobic glycolysis
- Drugs effective against coccidia, bacteria and other aerobic organisms have no direct effect on Histomonas.
Drugs for chemotherapy

• Effective drugs are principally in two groups; nitroimidazoles and related compounds, and arsenical nitrophenolic compounds. Most have been banned from use in Europe and North America. Closely related compounds are still used in human medicine and in companion animals for treatment of anaerobic infections.

• Other drugs with some effectiveness include paromomycin and nifurtimox

• New approaches to chemotherapy must center on understanding the hydrogenosome and how it can be destroyed.
Prevention by immunization

• Vaccination: Other papers presented here today show important advances in immunization using live attenuated histomonads.

• Advances in molecular biology have identified numerous virulence genes which may help in the understanding of immune protection and serve as targets for immunization.
And in conclusion...

• During the past decade we have made important discoveries in understanding this disease

• Advances in understanding the biology and biochemistry of this organism have led to possible control through immunization and management

• We must leave no stone unturned in our quest for a cure/prevention for this disease