Escherichia coli Infections (E. coli or Colibacillosis)

- Generally a secondary bacterial infection causing many different signs and lesions in chickens and turkeys.
- *E. coli* from avian sources do not cause problems in mammals.
- It is not known whether chickens can carry *E. coli* that are pathogenic to humans. Widespread distribution because it is an intestinal inhabitant.
Etiology

- The bacterium *Escherichia coli* which is in the family Enterobacteriaceae meaning it is found in the intestine: this organism is coliform, gram negative, and motile.

- Most problems in poultry are caused by somatic antigen serotypes 01, 02, and 078.
Comment

- *E. coli* is not part of “normal flora” of seed eating birds. It is more often seen in birds that eat protein of animal origin like poultry.
- *E. coli* causes major economic losses in the poultry industry.
Types of Infection

- Depend on where primary problem occurs.
  - Respiratory – airsacculitis along with mycoplasma or virus infection. Virus may be vaccinal. Without *E. coli*, the mycoplasma infections would be less significant.
  - Omphalitis – (embryo & early chick mortality) egg transmitted due to penetration from contact with contaminated environment (dirty nest, floor eggs, egg washing, sweating after refrigeration, and dirty hatching equipment). This is a major chick quality problem.
  - Gastrointestinal – This is seen in turkeys and is usually primary but predisposed by contaminated feed, water or crowding.
Other *E. coli* Related Conditions

- Acute or Chronic Septicemia Involves Most any Body Tissue
  - Bordetella infection in turkey coryza occurring at 2-4 weeks or age results in secondary invasion by *E. coli* with increased mortality at 6-8 weeks of age.
  - Coligranuloma – usually liver, spleen and intestines.
  - Blackhead – secondary to *histomonas*.
  - Arthritic infections.
  - After HE in turkeys.
Method of Spread

- Very ubiquitous organism.
- From contaminated environment.
- Mostly through fecal contamination.
Dirty eggs
Incubation Period

- 72 Hours experimentally in one day old chicks.
- Under field conditions variable depending on the primary infection.
Mortality

- Variable: Usually high in acute conditions but negligible in chronic problems.
- Causes much of the mortality in turkey coryza (Turkey bordetellosis).
Course of Disease

- Omphalitis in chicks and poults and enteritis and hepatitis in turkeys are usually acute.
- Other conditions such as infectious process, salpigitis, coligranuloma, and air sac disease are usually chronic.
Signs

- Variable depending on system infected.
- Cyanosis in cases of respiratory disease.
Postmortem Lesions

- Omphalitis
- Airsacculitis, peritonitis, perihepatitis, and pericarditis
- Enteritis
- Coligranuloma – looks like blackhead
- Salpingitis
- Arthritis and synovitis
- Infectious process
Omphalitis
Pericarditis, perihepatitis
Pericarditis
Perihepatitis
Chronic tenosynovitis
Arthritis
Coligranuloma
Coligranuloma
Coligranuloma
Coligranuloma
Coligranuloma
Infectious process
Infectious process
E. coli

- Differential Diagnosis
  - Mycoplasma
  - Respiratory virus – NCD, IB
  - Staph Infection
  - Fowl Cholera
  - Blackhead
  - Erysipelas
  - Salmonella
  - Other bacterial septicemias
*E. coli* in Turkeys

- Usually brought on by stress such as crowding and heat. Usually from 3 to 12 weeks of age.

- Lesions –
  - Enteritis – dark duodenum with purple spleen in dead birds.
  - Pericarditis
  - Turkey coryza
    - Bordetella + *E. coli*.

- Can occur secondary to hemorrhagic enteritis.
Enteritis
Pericarditis
Pericarditis
Treatment

- Don’t treat chicks with omphalitis – most *E. coli* are resistant to everything.
- Sulfa drugs and antibiotics.
- Run sensitivity study.
- *E. coli* resistant to most drugs available for use in poultry.
Prevention

- Good egg sanitation – decreases omphalitis and I.P. (pre-incubation fumigation).
- Don’t use floor or dirty hatching eggs.
- Use MG clean stock.
- Good, low stressful management.
- Continuous medication – not used much today as it can cause other problems.