Fowl Cholera

- All species of fowl affected.
- Both acute (primarily in turkeys) and chronic (primarily in chickens) infections occur.
- Young adults and mature birds usually affected.
- This rarely occurs in broilers but when it does, it is usually associated with a rodent control problem.
Causative Agent

- *Pasteurella multocida.*
- Bipolar staining Gram (-) rod.
- The most important bacterial infection in turkeys.
- Will survive 3 months in carcass.
- Found on membranes of healthy birds.
Different strains occur.

Most common serotypes:
- X-73 = serotype 1 – chickens and turkeys
- P1662 = serotype 4 – chickens and turkeys
- P1059 = serotype 3 – turkeys
- CU (Clemson University) vaccine = Crossing strain – 3x4

Pathogenic serotype most prevalent (80%) at present – non-vaccinal 3x4 – chickens and turkeys.
Other Avian Pasteurellas

- *Pasteurella anatipestifer* (ducks)
- *P. haemolytica* (colonies have B-hemolysis)
- *P. gallinarum* (in mixed chronic respiratory infections) are also pathogens and may cause disease in poultry and waterfowl.
Incubation Period
4 – 9 Days

Course of Disease

- Acute about two weeks, becomes chronic and may kill birds for several months.
- During the acute phase, mortality may be quite high.
Mortality

- Acute – up to 50%
- Chronic - 1-2% - develop swollen wattles and purulent joints.
- Death rate usually higher in turkeys than in chickens.
- Cholera usually occurs in older birds: >10 weeks in turkeys, and in broiler breeders.
Method of Spread

- Exact method unknown. Stress will exacerbate.
- Biological vector suspected to be main method (cats and rodents).
- Man and service vehicles.
- Once established in flock - respiratory route & water contamination. Large numbers of organisms are shed.
- Cannibalism in turkeys.
Clinical Signs

- **PERACUTE:**
  - May be found under roost or dead in the nest with no symptoms.
  - Rapidly mounting mortality.
  - Cyanosis of comb and wattles or whole head of turkey.
Peracute death
Clinical Signs (Cont.)

- **ACUTE:**
  - Depression, anorexia, and fever. Sick turkeys on range will hide along a fence or near trees.
  - Catarrhal nasal discharge and respiratory rales.
  - Greenish or yellow diarrhea.
  - Cyanosis.
  - CNS signs occasionally in turkeys and chickens.
Range turkeys
Clinical Signs (Cont.)

- **CHRONIC:**
  - Usually occurs in chickens after acute outbreak.
  - Edematous wattles – later become caseous.
  - Swollen joints with yellow caseous pus.
  - Torticollis – localizes in inner ear.
Depression
Lame turkey
Diarrhea/swollen joint
Swollen wattles
Diarrhea
Postmortem Lesions

- **PERACUTE:**
  - May be no lesions, or increased incidence of internal layers and egg yolk peritonitis in laying hens.
  - This is a good place to culture the causative organism.
Postmortem Lesions (Cont.)

- **ACUTE:**
  - Small hemorrhages on heart surface, gizzard, and abdominal fat.
  - Severe congestion of duodenal mucosa.
  - “Egg yolk” peritonitis.
  - Liver – congested, brown or yellow brown with or without pin point necrotic areas.
  - Tenacious mucous in mouth and nasal passage, especially in turkeys.
  - After 1 or 2 days, consolidation of lungs in turkeys. This is almost pathognomonic in turkeys but rare in chickens.
Congested Liver
Swollen liver, heart hemorrhages
Heart hemorrhages
Pneumonia
Congested liver - hemorrhages
Liver with necrotic foci
Egg yolk peritonitis
Pneumonia *in situ*
Swollen spleen / peritonitis
Pneumonic lung
Affected organs
Postmortem Lesions (Cont.)

- **CHRONIC:**
  - Caseous exudate in swollen wattles in chickens.
  - Suppurative exudate in swollen joints and tendon sheaths (may become caseous).
  - “Egg yolk” peritonitis.
Caseous exudate in wattles
Caseous exudate in wattles
Caseous exudate in wattle
Chronic Peritonitis
Chronic peritonitis
Foot pad exudate
Keel bursitis
Chronic arthritis
Diagnosis

- **SUGGESTIVE:**
  - Sudden rapidly mounting mortality, hemorrhages of heart, gizzard and abdominal fat, consolidated lungs, purulent wattles, and septic livers.
Diagnosis

- **POSITIVE:**
  - Isolation and identification of causative agent. Isolate from liver, spleen, lung. Brain and bone marrow are the best places to isolate the organism from dead birds.
Culture protocol

P. aeruginosa

Gram (-)

Oxidase reagent (+) colony-blue

TSI

- amber color (no gas)

Sugars

Mannitol -
Lactose -
Sucrose +
Maltose -
Colonies on blood agar

Pasteurella multocida
18 hrs
P. haemolytica colonies
Sensitivity plate
Differential Diagnosis

- Dependent on bacterial cultural method.
  - Must differentiate from:
    - **ACUTE**: Fowl typhoid, Colibacillosis, systemic Staphylococcus, Psittacosis and Erysipelas (in turkeys).
    - **CHRONIC**: Infectious synovitis, localized Staphylococcus, Salmonella in joints, Psittacosis, etc.
Classical mortality curve
Treatment

- Treat in water if possible.
- Drug of choice – Sulfadimethoxine (Albon) use as directed by drug company. Preslaughter withdrawal 5 days.
- Sulfaquinoxaline is effective but toxic – withdrawal 10 days.
CAUTION

- Sulfa drugs cannot be used in laying hens so they need to be well protected.
- Sulfa drugs will reduce production in laying birds.
- Also, will reduce hatchability in eggs from breeding birds.
Treatment (Cont.)

- Other sulfa drugs such as Sulmet, triple sulfa. Use as directed.
- Antibiotics – Choice terramycin or chlortetracycline 200-400 gm per ton of feed for five days; 400-500 mg/gal of water for five days.
- Can also use K penicillin in the water.
- Erythromycin, follow label recommendations.
- May also be injected.
INJECTIONS:

- Penicillin – Streptomycin combination 25 mg Dihydrostreptomycin and 500 units Procaine Penicillin G for each pound of body weight.
- CAUTION – Never exceed 75 mg Strep or 1500 units Pen in a single dose for chickens or 500 mg Strep in turkeys.
Prevention / Treatment

- If the turkeys are 12 weeks of age or less, vaccinate with live vaccine and treat in 4 or 5 days.
- Birds should not be treated 72 hours previous to vaccination or for 4 days post vaccination.
- Do not treat birds just prior to going to market.
Prevention

- Live field attenuated strain – CU strain good results in turkeys and chickens.
- Vaccinate turkeys in drinking water at 6-7 weeks prior to movement into the growout facility.
- Then every 3-5 weeks (once a month). Make sure watering systems are free from chlorine which will inactivate the vaccine.
- No. of vaccinations depends on individual farm status.
Prevention (Cont.)

- M-9 – attenuated CU – used in turkeys and chickens. So mild it is not recommended.
- Less immunity than CU but also less side effects.
- All live vaccines must be injected in chickens (wing web route). Oral vaccines given in the water are used in turkeys.
- PM-1 vaccine now available. This is a temperature sensitive mutant which is less virulent than CU, but more virulent than M-9. Use this vaccine in poults with pre-existing conditions. Follow up with a more virulent booster.
Wing web reaction
Prevention (Cont.)

- Killed vaccine – limited success in turkeys. Inoculated I/M or S/Q at 10 weeks or older and boost from 3 to 10 weeks later.

- Both aqueous and oil emulsion products available. Usually used in layer or breeder chickens.

- Better results are obtained if a live and a killed vaccine are given in either order than if two live or two killed are used.

- AUTOGENOUS BACTERINS
Prevention (Cont.)

- Live vaccines give a broader spectrum of protection. Vaccinate hens with live vaccine by the wing web “stick” method. Use PM-1 or CU strain vaccine and pox inoculation needle.
- CU vaccine will slightly increase the number of cull birds due to the development of joint problems in hens.
- Good plan to use CU along with a bacterin in heavy breeders and commercial layers.
Prevention (Cont.)

- Break cycle of infection with depopulation, follow by thorough cleaning and disinfection of the house and equipment.

- PROPER RODENT CONTROL

- Allow at least 30 days between flocks.
Pasteurella anatipestifer