POULTRY DISEASES BASIC INFO/NAVLE REVIEW

OUTLINE

A) Neoplastic:

Marek’s Disease: Herpesvirus (range paralysis)
Lymphoid Leukosis: Retrovirus (big liver disease)

B) Respiratory Diseases:

Newcastle Disease: Paramyxovirus
Infectious Bronchitis: Coronavirus
Infection Sinusitis: *Mycoplasma gallisepticum* (MG)
Chronic Respiratory Disease: MG and E. coli
Infectious Coryza: *Avibacterium paragallinarum*
Infectious Laryngotracheitis: Herpesvirus
Avian Influenza: Orthomyxovirus (fowl plague)
Turkey Coryza: *Bordetella avium*
Aspergillosis: *Aspergillus* fungus (Brooder Pneumonia)

C) Nervous System Diseases:

Encephalomalacia: Vitamin “E” deficiency (Crazy Chick Disease)
Avian Encephalomyelitis: Picornavirus
Botulism: *Clostridium botulinum*

D) Enteric Diseases:

Viral enteritis: Rotavirus, Reovirus, and Astrovirus, Coronavirus
Clostridial: *Clostridium* bacteria
Coccidiosis: *Eimeria* species
Histomoniasis: *Histomonas meleagridis* (Blackhead)
E) Systemic Diseases:

Avian Pox: Poxvirus
Fowl Cholera: Pasteurella multocida
Salmonella: Salmonella species
Colibacillosis: E. coli
Erysipelas Erysipelothrix rhusiopathiae

F) Internal Parasites:

Ascaridia galli. (round worms)
Heterakis gallinae. (cecal worms)
Syngamus trachea. (gape worms)
Capillaria (thread worms)
Coccidiosis Eimeria species
Histomoniasis (blackhead, enterohepatitis)

G) External Parasites:

Red Mites: Dermanyssus gallinae
Northern Fowl Mites: Ornithonyssus sylvarium
Lice: Biting Lice

I) Others:

Infectious Bursal Disease
Gout (visceral and articular)
Skeletal:
    Osteomyelitis
Tibial Dyschondroplasia

Rickets:
- Calcium and/or Phosphorus imbalance, Vitamin D₃ deficiency, feed

Twisted Tibia

Other:

### A) NEOPLASTIC: (chickens only)

<table>
<thead>
<tr>
<th>Comparison Areas</th>
<th>Marek’s</th>
<th>VS</th>
<th>Lymphoid Leukosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>3-14 weeks generally</td>
<td>&gt;16 weeks</td>
<td></td>
</tr>
<tr>
<td>Paralysis</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
</tbody>
</table>

**Gross Lesions: (tumors)**

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nerve</td>
<td></td>
<td>No</td>
</tr>
<tr>
<td>Liver</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Kidney</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Spleen</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Kidney</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Bursa</td>
<td>Enlarged/Atrophied</td>
<td>Nodular Tumor</td>
</tr>
<tr>
<td>Grey Eye</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Skin</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

**Agent**

| DNA Herpesvirus | RNA Retrovirus |

**Vaccination**

| Day of Age/inovo | None |

**Transmission**

| Horizontal (fluff) | Vertical (egg transmitted) |
| 1° feather follicle | Horizontal |

**Other Names**

| Range Paralysis | Big Liver |
Signs  | Asymmetrical | Non-Specific
--- | --- | ---
Paresis/Paralysis | Emaciated/ | Abdominal Masses
(Wing, neck or leg) | | 
Pale, shrunken comb | Penguin Walk | Pale, shrunken comb

DX  | Histopathology | Histopathology
--- | --- | ---
Pleomorphic Lymphocytes | Uniform blast cells | 
Clinical Lesions, Age & Lesions

Comments:

Marek’s
Most common of the Lymphoproliferative diseases of chickens

Lymphoid Leukosis
Infection occurs in all chicken flocks, with few exceptions. By sexual maturity most birds have been exposed. Incidence of clinical disease is low.

B) RESPIRATORY

1) Newcastle Disease (ND) – also called pseudofowl pest

Paramyxovirus

3 pathogenic classifications

LENTOGENIC: Few or no clinical signs
Little or no mortality

MESOGENIC: Moderately pathogenic, Respiratory signs
Decrease egg production, +/- Central nervous system (CNS), +/- Mortality
**VELOGENIC:** Acute respiratory distress  
CNS signs (paresis, paralysis, circling, tremors, & torticollis)  
Mortality & morbidity are high – up to 100%  
VVND (exotic Newcastle), Hemorrhagic lesions in intestinal tracts

Most endemic strains are lentogenic  
ND: Hemagglutinates RBC

Can be found in chickens, turkeys, & pigeons.

<table>
<thead>
<tr>
<th><strong>ENZOOTIC (mesogenic)</strong></th>
<th><strong>EXOTIC (VVND)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sudden onset</td>
<td>Short course</td>
</tr>
<tr>
<td>Mild respiratory signs</td>
<td>Severe respiratory signs</td>
</tr>
<tr>
<td>Low or no mortality</td>
<td>Up to 100% morbidity and mortality</td>
</tr>
<tr>
<td>CNS signs may follow</td>
<td>CNS (torticollis)</td>
</tr>
<tr>
<td>Respiratory signs</td>
<td>Diarrhea, Paralysis, and Conjunctivitis</td>
</tr>
<tr>
<td>Sudden ↓ egg production</td>
<td>↓ egg production or cessation of lay</td>
</tr>
<tr>
<td>Low quality eggs</td>
<td></td>
</tr>
<tr>
<td>Soft shells</td>
<td></td>
</tr>
</tbody>
</table>

Sudden onset, marked depression and respiratory signs (gasing, coughing, nasal discharge), signs of CNS (usually 0-25%) show signs

Young: Later – paralysis, prostration  
Death, mortality up to 50%

Lesions: None to minimal  
+/- Tracheitis  
Tracheitis, airsacculitis  
Hemorrhagic or focal

(50-100%) more acute.
Airsacculitis  necrotic lesions in mucosa,
Conjunctivitis  surface of intestines,
Proventriculus, cecal tonsils,  gizzard

*Turkeys – signs and lesions similar to chickens

DX Lab:  Virus isolation:
  Swab trachea or cloaca
  Lung, spleen, bone marrow
  Histopath – CNS, systemic lesions

Serology:  Paired serum
  Hemagglutination – inhibition tests (HI)
  Virus isolation

RX:  “NO TREATMENT”
Antibiotics – prevent 2° bacterial infections
Vaccination

VVND REPORTABLE DISEASE, USDA SELECT AGENT
Biosecurity

2) Infectious Bronchitis

Coronavirus
  Acute: Highly contagious (36 hours) respiratory disease
  Nephrotropic strain
  Marked drop in egg production, misshapen eggs, poor internal egg quality

Chickens Only:
  Does not hemagglutinate RBC
  Two common serotypes (Connecticut and Massachusetts)

Signs:
  Coughing, sneezing, nasal discharge
High morbidity
Up to 50% decrease in egg production
   Soft shell and misshapen eggs
   Watery whites (albumin)
   False layers

“Air sac” Airsacculitis with complications
Swollen kidneys
Peritonitis (egg yolk)

DX: Virus isolation – tracheal swabs
   Lung/trachea
   Serology – paired serum (ELISA + Virus Neutralization)
   Fluorescent Antibody (FA)

RX: Similar to ND
   Vaccinate only “clean” birds (birds free of Mycoplasma or other
   Respiratory disease)
   Increase temperature of house
   TLC, antibiotics to prevent 2° bacterial infection

3) **Avian Influenza** (fowl plague)
   Causative Agent – Orthomyxovirus
   Many avian species can be affected
   Water fowl (stable/no mutations) > Shore birds> Game Birds > Turkeys
   >> Chickens (uncommon)
Classified groups A (humans, avian, swine, horses), B (humans), C; (humans)
Introduction: Defined by 16 HA (hemagglutinin) & 9 NA (Neuraminidase)
   H5 & H7 Important for Highly Pathogenic AI
Signs / Lesions:
   Low Path - None to mild
High Path - Severe drop in egg production, increased mortality, hemorrhage and edema

DX: Serology, virus isolation, no treatment may have regulatory consequences
Prevention: BIOSECURITY!

4) Mycoplasma

Smallest free-living organism
No cell wall
Fragile
Poor antigen
MG (gallisepticum) MS (synoviae)
MM (meleagridis) (turkeys only)

(MG):
Turkeys (T): Severe sinusitis (coughing)
Chickens (C): CRD (Chronic Respiratory Disease) or not apparent
Signs:
“T” (Turkeys) – Nasal discharge (clear, viscous)
   Foaming ocular discharge
   “Saddle ring”
   Swollen sinuses

“C” (Chickens) – Nasal discharge, coughing
   Depressed egg production (gradual)
   Severe signs – accompanying infections
   ND, E. coli, Airsacculitis

Immunity:
Infection persists
Sheds – horizontally + vertically (egg transmitted)
Immune depressant
DX:

Clinical signs
Culture Blood agar / Mycoplasma agar
(rule out bacterial causes)
Serology Rapid plate agglutination, PCR (polymerase chain reaction)
HI (Hemagglutination inhibition)

Control:
Breeder level Backyard
Depopulate Depopulate
(Egg transmitted) (Egg transmitted)
or or
Dip + inject eggs *Antibiotics
Inject poults Tylan
Test progeny Erythromycin
(Serology & culture) (Test & slaughter)
(Test & slaughter) *Difficult to clear infection
(Serology positive)

5) Coryza

5.A) Chicken Coryza
(Avibacterium paragallinarum)

Small gram negative rod or coccobacilli
Acute – subacute disease of chickens

Signs:
Conjunctivitis
Sinusitis, edema of the face
Sneezing
Foul odor
Affects birds 8-20 weeks of age
Decrease egg production
Lasts several weeks – longer if complicated (E. coli, MG)

DX: History & Signs

Differentiate from other respiratory diseases of chickens

Smear of sinus exudates
G-bipolar rods

Blood agar with *Staph aureus* streak
V-factor
Candle jar
Catalase negative

RX:
Depopulate – Remove Carriers or

Antibiotics:
Sulfadimethoxine
Tylan
Erythromycin

Bacterin (USDA licensed)

5.B) Turkey Coryza

Avian Bordetellosis (*Bordetella avium*)
Adhesion to respiratory epithelium
Heat-labile toxin and cytotoxin production
4-6 week duration. This will be longer when occurring with concurrent disease.
High morbidity (80-100%). Primarily seen in young turkeys under 4-5 woa
Mortality is relatively low. Can reach up to 40% in complicated cases
(E.coli) >4-5 wks of age poults become refractory to the disease, but may continue being carriers

DX: Sinusitis
    snick or cough
    tracheal rales
    airsacculitis seen in complicated cases

TX: Antibiotics not very effective. Resistance is common
    Bacterin and Live Mutant Vaccine: Best given at >3woa
    Not commonly used in breeder flocks

6) Infectious Laryngotracheitis
    Causative agent – herpesvirus

Signs:
    Severe dyspnea with bloody exudates from nares or mouth
    Coughing and sneezing
    Spreads slowly through flock
    Mild drop in egg production
    1° affects adult birds
    Not egg transmitted

Lesion:
    Hemorrhagic tracheitis
    Cheesy tracheal plus (dead birds)

Treatment – None, Can vaccinate in face of outbreak
    Eye drop, water or spray application
DX:
Histopathology, PCR, Virus Neutralization, Virus Isolation

RX:
None (viral), can vaccinate in face of outbreak

7) Other
Turkey coryza (*Bordetella*)
Aspergillosis (brooder pneumonia)
CRD (Mycoplasma, *E. coli*, Viral)

Management
Dust, Ammonia (litter and ventilation management)
Day/Night Temperature Fluctuations

C) NERVOUS SYSTEM

Disease Agents

<table>
<thead>
<tr>
<th>Viral</th>
<th>Bacterial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avian Encephalomyelitis</td>
<td>Arizonosis (localized)</td>
</tr>
<tr>
<td>Avian Influenza</td>
<td>Pasteurella (localized)</td>
</tr>
<tr>
<td>Arborviruses</td>
<td>Salmonella (localized)</td>
</tr>
<tr>
<td>Newcastle Disease</td>
<td>Clostridial (Botulism)</td>
</tr>
<tr>
<td>Marek’s Disease</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mycotic</th>
<th>Nutrition</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aspergillosis</td>
<td>Vit. B1, B2, deficiency</td>
<td>Musculoskeletal problems</td>
</tr>
<tr>
<td>Dactylaria</td>
<td>Vit. E deficiency</td>
<td>Trauma</td>
</tr>
</tbody>
</table>
Parasitic	Toxicosis
Toxoplasma	Various drugs, metals and insecticides
Baylisascaris

1) Encephalomalacia (Crazy Chick Disease) - Vitamin E Deficiency,
How – Feed: Oxidation – heat/moisture, rancid fats, etc.
Low levels of antioxidizing agents in feed
Enteritis (decreases absorption of fat-soluble vitamins)

Clinical Signs:
15-30 days of age
Ataxia – contractions – prostration – death

Lesions:
Cerebellum
Hemorrhage
Swollen

DX: Gross lesions and signs – Histopath

RX: Vitamin E supplement in water
Chemical antioxidants in feed

2) Avian Encephalomyetitis (Epidemic Tremors) - Picornavirus

<table>
<thead>
<tr>
<th>Adults</th>
<th>Young</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rare to see signs</td>
<td>1-2 weeks of age</td>
</tr>
<tr>
<td>Production drop in eggs</td>
<td>Progressive Ataxia</td>
</tr>
<tr>
<td>5-25% drop</td>
<td>Fine tremors</td>
</tr>
<tr>
<td>Lasts approximately 2 weeks</td>
<td>40% - 60% morbidity</td>
</tr>
</tbody>
</table>
Gross Lesions:
None +/- white focal areas in muscle of proventriculus or gizzard

DX: Paired serology – Lab
FA (brain, pancreas)

Control:
Live vaccine
Vaccinate 10-18 weeks of age (egg transmitted)

3) Botulism (Clostridium botulinum)
Types A and C
Neurotoxin

Epizootology

a) Epizootology:

Birds die → Bacteria invades
Tissue from GI (C. botulinum)
↓
Anaerobic Environment
(in gut tissue)

Birds become Intoxicated → Produce Toxin

Birds eat fly larva and carcass (dead larva)

Fly lays eggs on carcass
Larva consume preform toxin
b) Warm alkaline water & decaying organic matter

Toxin production \[\rightarrow\] Dead larva and other aquatic insects

Recycles toxin (fly blown carcass)

Birds ingest larva

Death

Clinical Signs:

Intoxicated:

Drowsy, weak

*Neck paralysis (limber neck)

“Floaters” – found dead on surface of lakes or ponds

No gross lesions

Pathology:

Neuromuscular transmission impeded

Interference with secretion of Acetyl cholinesterase

Efferent parasympathetic somatic motor nerves affected

Flaccid paralysis
Prevention / Treatment
Remove dead birds
Remove source stagnate water (gravel)
Toxoid – Type C
Epsom salt

D) ENTERITIS

1) Disease Agents

A) Viral
Rotavirus Corona
Rota-like Reo
Astro virus Adenovirus (HE)
Astro-like

B) Bacterial
   a. Ulcerative Enteritis – Quail Disease
      *Clostridium colinum*
      Crater-like lesions

      RX Bacitracin Zn (H2O)
      Penicillin (H2O)

   b. Necrotic Enteritis
      *Clostridium perfringens*, close association with initial cocci
      or IBD infection
RX Penicillin + Amprolium (H2O)
Penicillin or Bacitracin and Amprolium

c. Others

Salmonella          Staph / strep
E. coli            Mycobacterium

C) Protozoan

1. Coccidia
2. Histomonas (covered with cecal worms under internal parasites)
3. Cryptosporidia
4. Hexamitas
5. Giardia

D) Helminths

1. Ascarids
2. Capillariosis
3. Heterakis

2) Feed ingredients

Sodium content of feeds/diet

3) Brooder House Management

Litter Quality          Water Quality
More information on specific enteric diseases:

A) Coccidiosis

Young birds primarily, characterized by diarrhea and enteritis

Single cell protozoan
   Host specific/site specific
   Eimeria genus

Direct/complicated life cycle

One sporulated oocyst may produce 100,000 offspring
Oocyst very resistant/ survives 18 months.

Common Species of Coccidia

<table>
<thead>
<tr>
<th>Chickens</th>
<th>Type</th>
<th>Description of Lesions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Eimeria acervulina</strong></td>
<td>Upper intestines – mild to severe enteritis</td>
</tr>
<tr>
<td></td>
<td>(moderately severe pathogen)</td>
<td>Thickening of mucosa. Transverse white to gray striations or plagues on mucosa</td>
</tr>
<tr>
<td></td>
<td><strong>E. necatrix</strong></td>
<td>Mid intestines – severe enteritis, congestion, hemorrhage, necrosis and bloody feces</td>
</tr>
<tr>
<td></td>
<td>(severe pathogen)</td>
<td>White to yellow foci and petechial Hemorrhages seen through serosa. Oocysts develop only in ceca</td>
</tr>
</tbody>
</table>
**E. brunetti**  
(moderately severe pathogen)  
Lower intestines – fibrinous or  
Fibrinonecrotic mass of debris may  
Cover mucosa or produce caseous  
Caseous cores in cecum or rectum

**E. tenella**  
(severe pathogen)  
Cecum – marked typhlitis.  
Blood often apparent in ceca and feces,  
later cheesy cecal cores may be found.

Common disease of chickens and sometimes turkeys. Usually seen in young growing birds and susceptible older birds. Occurs under conditions of warmth and high humidity or conditions that lead to wet litter.

Coccidia are host specific, therefore do not pass among the various types of poultry.

Coccidia produce lesions in intestines by destruction of epithelial cells, through their replication process.

Infection with one species of Coccidia stimulates an immune response only to that one species. Host still remains susceptible to other strains of Coccidia.

Host can be infected simultaneously by multiple species

**Turkeys** – Gross lesions develop with severe infestation

<table>
<thead>
<tr>
<th>Type</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>E. adenoeides</em></td>
<td>Cecum</td>
</tr>
<tr>
<td><em>E. gallopavonis</em></td>
<td>Lower intestines</td>
</tr>
<tr>
<td><em>E. meleagridis</em></td>
<td>Mid intestines</td>
</tr>
</tbody>
</table>

Clinical signs: Young poults 1-6 weeks +  
Bloody / mucoid diarrhea
Ruffled feathers, listless, weak, chirping
Economically Important
DX: Gross lesions, direct scrapings (smear), fecal?

**RX:**
- Amprolium – water
- Litter Management (20-30% moisture optimum)
- Sulfa (Agribon) – water
- Vit A and K – water

**Prevention #1**
- Amprolium medicated starter feed, other Coccistats – feed shuttle program
- Litter moisture = 20-30 %
- Coccidiosis vaccination

**B) Necrotic Enteritis**
Acute bacterial (Clostridium perfringens) disease primarily of chickens & turkeys. Characterized by sudden death, friable and distended intestines and severe necrosis of the mucosal lining of the intestines.

**Occurrence:**
- Chickens: 2 - 10 weeks of age raised on litter
- Turkeys: 7 - 10 weeks of age

**Associated with the following:**
- Organic & Antibiotic Free Production practices

**Predisposing factors**
- Enteric conditions – Cocci, worms, HE virus, Salmonella
- Microflora changes – Wheat & fish meal based diets, no feed, sudden feed changes
- Immunocompromised – Marek’s Dz., Infectious Bursal Disease (IBD),
Hemorrhagic enteritis (HE – turkeys)

Etiology:

Clostridium perfringens types A and C
Normal inhabitant of avian intestines

Intestinal mucosal damage is necessary for C. perfringens to multiply and produce toxins.

Control and Treatment:

Good management practices

Clean and disinfect buildings,
Repeat problem flocks

Treat house by adding salt to floor (60 -65 lbs/1000 ft)
Acidify the drinking water

All predisposing factors must be controlled
Administration of an in-feed coccidiostat program

Treat with antibiotics
Penicillin, bacitracin,

Other Options
*Oregano *, Bio-mos

D) SYSTEMIC DISEASES:

1) Pox (Avian)

Large DNA virus

Common Types of Avian Pox:
Bolinger bodies (eosinophilic cytoplasmic inclusion bodies) on histopathology

Slow spreading, 1° mechanical vectors (mosquitoes), trauma (picking)

Dry pox: Cutaneous lesions on unfeathered parts of bird
Wet pox: Oral diptheritic lesions, associated with higher mortality

Strong immunity

Diagnosis: Signs and Histopathology

Treatment: Isolate bird
Remove scab – Rx for 2° bacterial infection, scab contains live Poxvirus
Topical antibiotic (furox spray), pine tar, alcohol
Vaccinate (in face of outbreak) wing-web

2) Fowl Cholera

#1 disease in California turkeys
Very contagious and causes high mortality

*Pasteurella multocida* causative agent (gram negative rod, does not grow on MacConkey agar)

Signs/Lesions:

Chickens - sudden death, anorexia, depressed, torticollis, abscesses, ecchymotic hemorrhages (heart), enteritis

Turkeys - same as chickens + consolidated & necrotic lungs
(hard lungs) blood in mouth, airsacculitis

Diagnosis:
Culture, must differentiate from erysipelas (gram & rod) (acute mortality)
Blood agar, gram stain

Treatment:
Agribon (sulfa compound)
Tetracycline / Oxytetracycline [water or injectable]
Naxcel (injectable)

3) Salmonella 2,600 + serotypes

A) Host specific (Avian)
   Non-motile organisms
   Egg transmitted
   Non-zoonotic

*1. **S. pullorum** – Bacillary white diarrhea
   young & asymptomatic in adults

*2 **S. gallinarum** – Fowl typhoid
   young & affects adults also

* NPIP for breeders – test and slaughter

B) Non-host specific (Paratyphoid)
   Motile organisms
   Egg transmitted
   Zoonotic: examples are **S. typhimurium**, **S. enteritidis**

Signs:
   Chicks/Poults: weak, anorexic
pasting of vent (diarrhea)
chirping (shriek)
mortality around 1-4 weeks of age
stunting

Semi-mature (*S. gallinarum*)
Pale comb/wattles
diarrhea

* National Poultry Improvement Plan [NPIP]*

Lesions: (1° young birds)

<table>
<thead>
<tr>
<th>Type</th>
<th>Lesions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute</td>
<td>None</td>
</tr>
<tr>
<td>Subacute to chronic</td>
<td>Cecal cores, enlarged spleen</td>
</tr>
<tr>
<td></td>
<td>Grey nodules in liver, spleen, intestines,</td>
</tr>
<tr>
<td></td>
<td>cecum &amp; heart</td>
</tr>
<tr>
<td>Paratyphoid</td>
<td>Marked enteritis, necrotic foci on liver</td>
</tr>
<tr>
<td>Adults</td>
<td>1° intestinal carriers, salpingitis</td>
</tr>
</tbody>
</table>

Diagnosis: Serology / culture (State Lab)

Treatment – Sulfa Compounds, Neomycin (paratyphoids)
Pullorum - Test & slaughter

Prevention – Bio-security, Rodent control, breeders ???
Pullorum - Test & slaughter

**4) E. Coli**

Associated with Colibacillosis

CRD (Chronic Respiratory Disease)
Colisepticemia
Omphalitis (Mushy Chick Disease)

Common secondary bacterial invader
Environment (dust, ammonia, etc.)

Lesions: Perihepatitis, pericarditis, airsacculitis (trilogy of CRD)

Omphalitis: Associated with young chicks/poults at hatching
Infection of yolk sac.

RX / Control: Tetracycline, CTC, Naxcel (injectable)
Avoid stress (poor ventilation, dust, and ammonia)
Clean litter, air and water
Review flock management
Chick/poult quality

5) Other

Staphylococcus

Associated with Bumble Foot, green liver syndrome (turkeys)

Erysipelas
Acute mortality in turkeys – RX – Penicillin, vaccination (killed Product)

F) PARASITES

1) Internal Parasites:
a) Round worms
Ascaridia galli – chickens
Ascaridia dissimiiis – turkeys
most common, species are host specific
direct life cycle approximate 30 days, eggs remain viable
for up to 3 months (ova carried by worms or
grasshoppers)

enteritis (small intestines)
emaciation

DX: Fecal or gross

RX: Piperazine, Fenbendazole (Safe Guard) and management
Levamisole

b) *Heterakis gallinae* (cecal worms)

Associated with Blackhead
1.5 cm seen at tips of cecum, nodules on cecal wall

Direct L/C (ova carried by Earthworms)

DX: Fecal or gross

RX:
  - Piperazine
  - Phenothiazine
  - Ivermectin and management

**Histomoniasis** (*H. meleagris)*
Blackhead/infectious enterohepatitis
1° a disease in turkeys, less severe in chickens

Life Cycle

Protozoan \(\rightarrow\) w/in *Heterakis gallinarum* eggs (cecal worm) \(\rightarrow\) w/in *H. gallinarum* worms
Protozoan \(\rightarrow\) feces (fresh)
Protozoan \(\rightarrow\) w/in *H. gallinarum* eggs \(\rightarrow\) w/in earthworms \(\rightarrow\) eaten by
turkeys (cecal worms can be a common inhabitant of chickens)
Signs:

- Depressed, listless, sulfur dropping (urine)
- Leukocytosis approximately 70,000/ml
- Decrease serum protein, increase LDH

*Gross:

- Necrotic foci (depressed) “target” lesions – liver
- Ulceration / caseation of the cecum (cecal core)

RX: no approved medication for treatment in poultry

Prevention:

- Raise turkeys away from chickens

c) *Syngamus Trachea* (Gapeworm)

Red nematodes – trachea

- Chicken, turkeys, game birds

“Forked worm”

- smaller male is attached to the larger female
- focal tracheitis
- 2.0 cm long

Signs: Gasping, dyspnea, and head shaking

- Earthworms, slugs, snails serve as transfer hosts to direct L/C

DX: fecal/gross
RX:  Thiabendazole
       Ivermectin
       Fenbendazole

d) Capillary worms

Small, hair-like round worms
Cause more damage than Ascaridia (large round worms)

Two important species

   Annulata – requires earthworm as intermediate host

   Contorta – direct life cycle causes more damage than Annulata

Signs: Weight loss, decrease egg production
       Other non-specific signs

Lesions: Marked thickening of crop and esophagus = crop mycosis
         Enteritis.

e) Other

   Coccidia
   Tape Worms

2) External parasites

a) Mites

   Red mites (*Dermanyssus gallinae*)

       Blood suckers - anemia
       Feed at night (found on birds only at night)
Daytime – cracks/joint of roosts

Northern Fowl Mites (*Ornithonyssus sylviarum*)

Blood suckers
Stay on host continuously
Near vent

Scaly leg (*Knemidokoptes mutants*)

Shanks and feet
Skin thickened and hyperkeratotic

b) Lice

Biting lice (1-6 mm)
Vent area
Entire life cycle on host
Birds become unthrifty

c) External Parasite Treatment & Control

Prevention – Assure that new birds brought to farm or flock are free of external parasites
Control access of wild birds and rodents

RX: Dust bird or coop
Spray
Malathion Apply via: dust box
Permaban spray individually – vent 1°

Inject
Ivermectin (off-label)
H) OTHER DISEASE CONDITIONS

1) IBD

Virus – Birnaviridae
"Aids" of chickens (Lymphocidal)
Affects the Bursa of Fabricius

Age: 3-20 weeks of age

Clinical Disease
  Sudden onset, diarrhea, vent picking
  Morbidity 100%, mortality 5-30%

Lesions:
  Swollen bursa 1-5 days
  (Yellow – hemorrhagic)
  Atrophies by day 8 of infection

Subclinical Disease
  Age: 0-3 weeks of age
  No clinical signs
  Irreversible damage too bursa
  Virus destroys Lymphocytes
  Immunosuppressed
  Birds are unable to respond to vaccines

Prevention: Management and vaccines are available

2) Gout

Purine metabolism – uric acid – poorly soluble

Increase saturation point – precipitates out on serosal surface and joints (chalky white crystals)
Causes:  Blocked ureters   Vit A deficiency
         Kidney damage     Excess protein
         Excessive dehydration

Treatment:  Allopurinol   Inhibits xanthine oxidases thereby
            Decreasing production of uric acid
            Also increased water consumption

ADDITIONAL COMMENTS

1) Chicken only Diseases
   Infectious Laryngotracheitis
   Infectious Bronchitis
   Infectious Coryza (Avibacterium paragallinarum)
   Infectious Bursal Disease
   Marek’s
   Lymphoid Leukosis

2) Turkey only Diseases
   Mycoplasma meleagridis
   Hemorrhagic Enteritis

3) Zoonotic Diseases
   Ornithosis – Avian Chlamydiosis
   Erysipelas
   Campylobacter
   Salmonella
   Listeria
   Newcastle – vaccine spray
4) Anatomy

Left ovary functional
Female determines the sex of offspring
Uric acid primary component of fecal material

**TABLE #1**

**DISEASES THAT CAN BE EGG TRANSMITTED**

A) Transovarian – Via the Oviduct:

1. Chronic Respiratory Disease – Mycoplasma gallisepticum (C)
2. Infectious Sinusitis – Mycoplasma gallisepticum (T)
3. Avian Encephalomyelitis – Picornavirus (C,T)
4. Egg – Drop Syndrome – 76 and other Adenovirus (C)
5. Infectious Synovitis – Mycoplasma synoviae (C,T)
6. Airsacculitis – Mycoplasma meleagridis (T)
7. Lymphoid Leukosis – Retrovirus (C)
8. Pullorum – Fowl Typhoid- Salmonella pullorum, S. gallinarum, (C,T)
9. Viral Arthritis – Reovirus (C)
10. +/- E. Coli (C,T)

**CONTROL AT THE BREEDER LEVEL**

7 .......... Genetic selection; serology to select non-transmitters
3,4,9, ... Vaccination of Breeders
1,2,5,6, . Treatment of eggs with antibiotics or heat, serology, culture, management
                procedures, this may include test and slaughter for Mycoplasma
8 ........ Test and slaughter of infected breeders; egg and hatchery sanitation
10 ....... Egg and hatchery sanitation

B) Shell Transmitted Diseases:
Contaminants: Occurs while the egg cools – temperature gradient pulls in surface contaminants through the shell pores

1. Arizona paracolon, can be transovarian
2. Paratyphoid – Salmonella sp. (C,T) can be transovarian
3. Omphalitis – E. Coli, Pseudomonas, Proteus, coliforms (C,T)
4. Aspergillosis – Aspergillus fumigatus (C,T)
5. Fecal Contaminants – i.e., ND, AI during acute infection of virulent strains

Controlled through egg and hatchery sanitation