Poultry Farmer Workshop: Husbandry / Disease / Pasture Management

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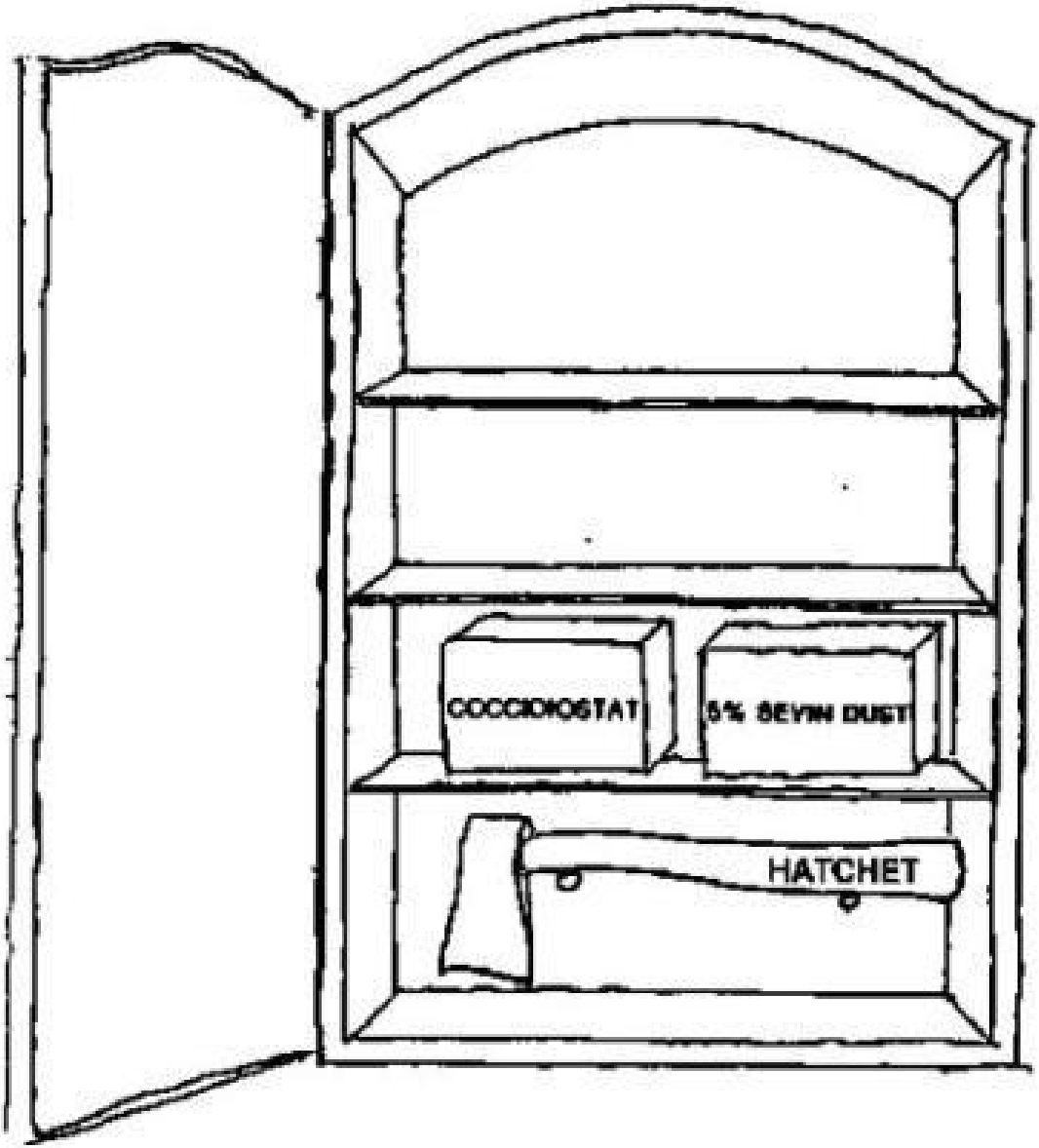
POULTRY PRACTIONER

CUTLER ASSOCIATES

NAPA, CA

COMMON BACK YARD POULTRY DISEASES

- **A) Neoplastic:**
- **B) Respiratory Diseases:**
- **C) Nervous System Diseases:**
- **D) Enteric Diseases:**
- **E) Systemic Diseases:**
- **F) Skeletal:**
- **G) Internal Parasites:**
- **H) External Parasites:**
- **I) Others:**



The Author's Medicine Cabinet

Missing from the shelves are fresh air, sunlight, genes for resistance to disease, soil, humus, green grass, insects, worms, commercial feed and a

Conventional production vs cage free / outdoor access

- Respiratory
  - Bronchitis, Pox, Laryngotracheitis, Influenza (AI)
- Bacterial
  - Mycoplasma, Pasteurella (Cholera), Erysipelas
  - E. coli (+/1-), Salmonella
- Parasitic
  - Coccidiosis, Worms (round, tape), mites, lice, Histomonas

Conventional production vs cage free / outdoor access

- To put the fear of GOD into you about the prevention of introducing one or more poultry disease(s) into your operation!
  - Fowl Cholera, Coryza, Infectious Laryngotracheitis
    - Will stay forever in a multi-aged poultry farm
  - AI / vNDV (END)
  - Salmonella (Food Safety)
    - SE, ST, SH, ETC

POULTRY DISEASES
NEOPLASTIC

- Marek's Disease: Herpes virus ("range paralysis")
- Lymphoid Leukosis: Retrovirus ("big liver disease")
- BOTH ARE CHICKEN ONLY DISEASES!!

POULTRY DISEASES

NEOPLASTIC

Comparison areas	Marek's	Lymphoid Leukosis
Age of Signs	<4-6 weeks	>16 weeks
Paralysis	YES	NO
Agent	DNA herpes virus	RNA retrovirus
Vaccination	Day of Age	None
Transmission	Horizontal (fluff) primary feather follicle	Vertical Egg transmission
Other Names	Range Paralysis	Big Liver
Cell type	T Cell	B cell

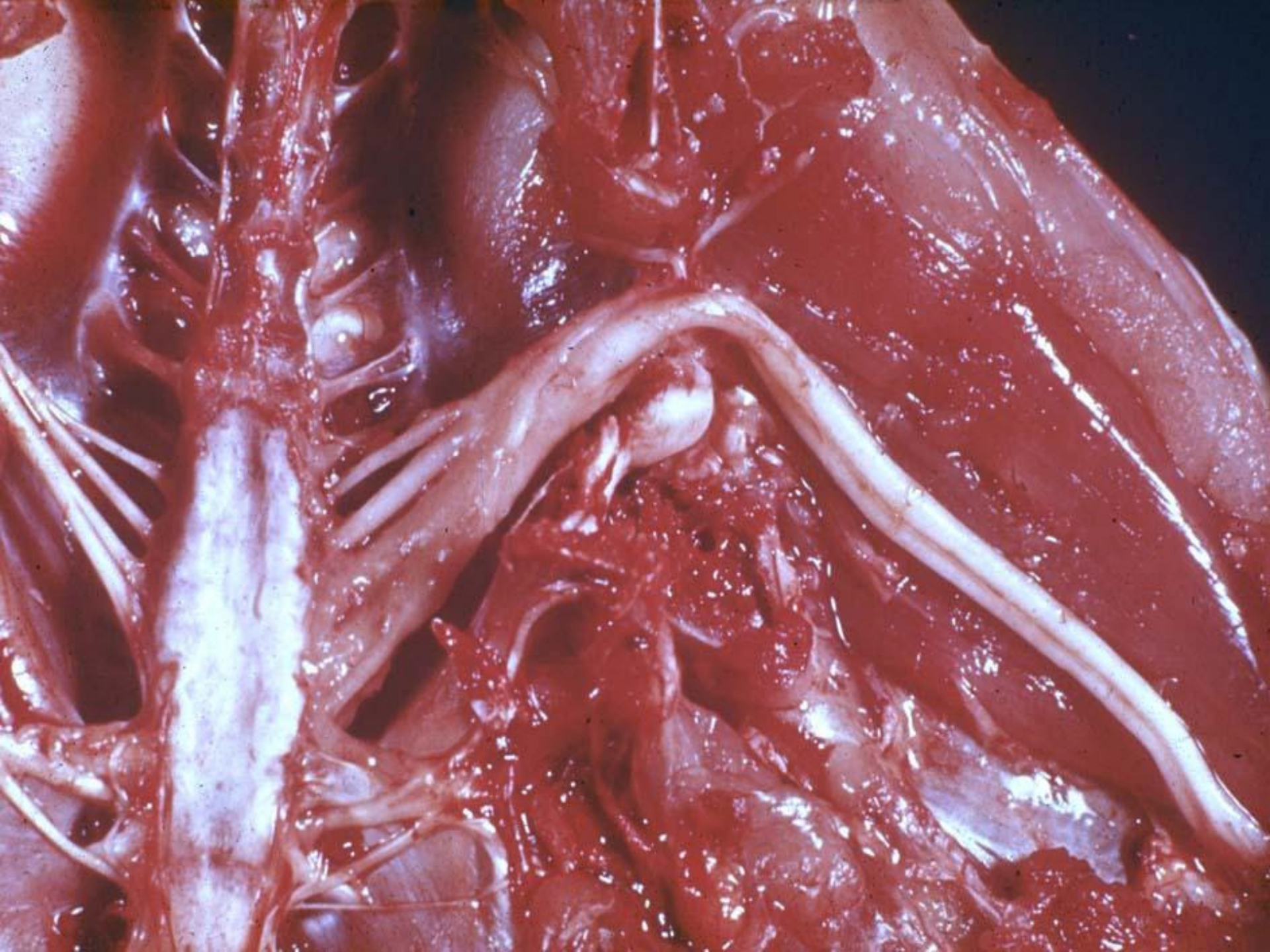
POULTRY DISEASES
NEOPLASTIC

- Gross Lesions: (tumors)

Comparison Areas	Marek's	Lymphoid Leukosis
Nerve	Yes	No
Liver	Yes	Yes
Kidney	Yes	Yes
Spleen	Yes	Yes
Bursa	Enlarged or atrophied	Nodular Tumor
Grey Eye	Yes (adult)	No
Skin	Yes	No

POULTRY DISEASES
NEOPLASTIC

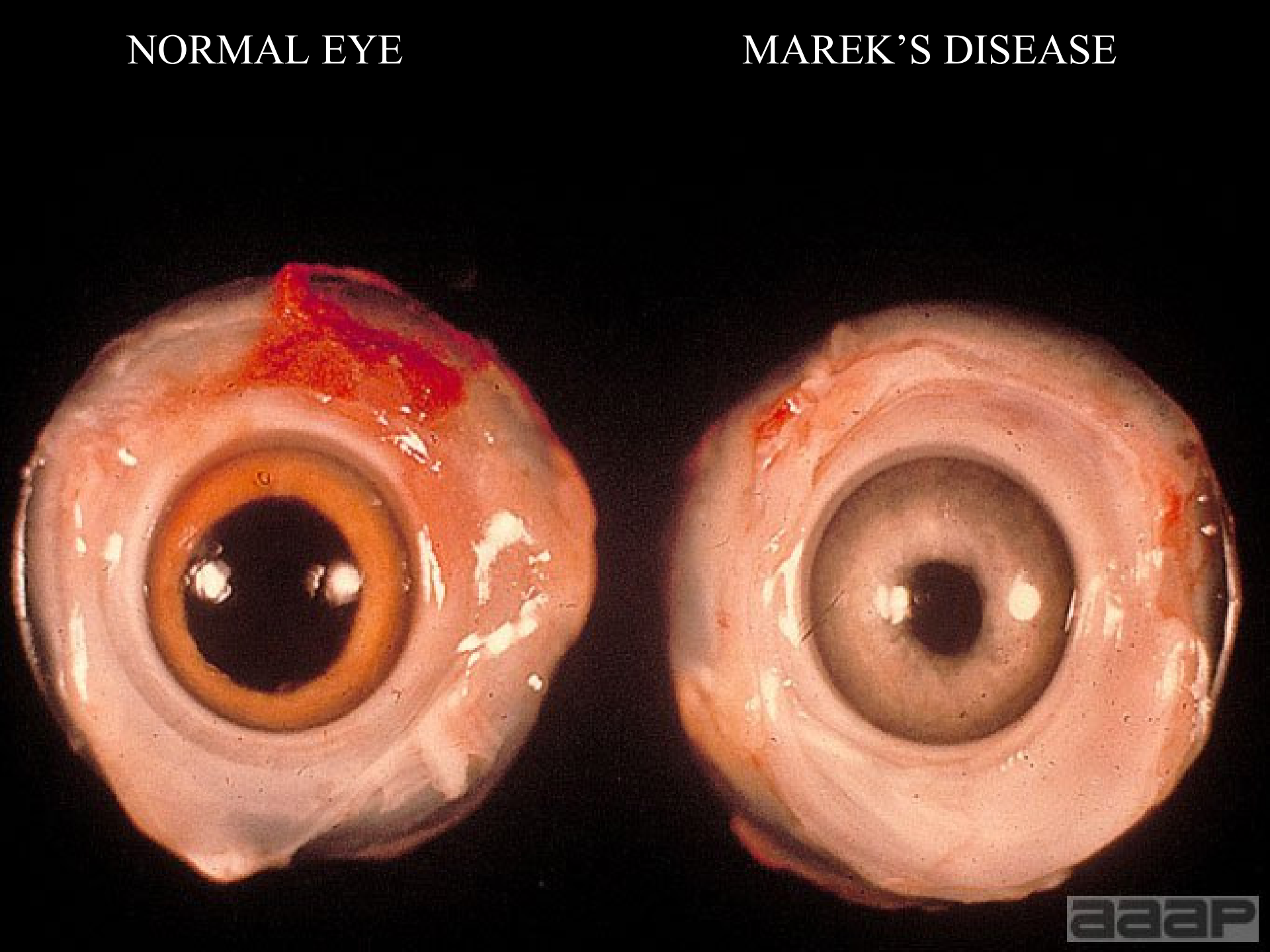
Comparison areas	Marek's	Lymphoid Leukosis
Clinical signs	Asymmetrical Paresis/Paralysis (wing, neck or leg) Pale shrunken comb	Non-Specific Emaciated/abdominal masses Pale shrunken comb Penguin walk/stance



Normal spleen vs enlarged spleen

NORMAL EYE

MAREK'S DISEASE



POULTRY DISEASES
NEOPLASTIC

- Comments:
  - Marek's
    - Most common of the Lymphoproliferative diseases of chickens
    - Controlled through day-old vaccination programs
  - 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.
    - Controlled though breeder selection (test & slaughter)

POULTRY DISEASES
NEOPLASTIC

- Diagnosis
  - Microanatomy (Histopathology)
  - Clinical signs
  - Age of the affected bird

POULTRY DISEASES
NEOPLASTIC

- Prevention
  - Vaccinate against Marek's!!!
    - MD-Vac CFL (Zoetis) live Turkey Herpes Virus vaccine- $20 per bottle
    - 0.2mL sub-Q in back of neck in 1 day old chicks
    - Only vaccine that doesn't require a liquid nitrogen tank for storage
    - Cannot save the vaccine once it has been rehydrated, so you will need a new bottle for every hatch!

POULTRY DISEASES
NEOPLASTIC

- Outcome for clinical birds = humane euthanasia
  - cervical dislocation for backyard birds
  - CO_2 for commercial birds

RESPIRATORY DISEASES

- Newcastle Disease: Paramyxovirus
- Infectious Bronchitis: Corona virus
- Avian Influenza: Myxovirus (fowl plague)
- Infectious Laryngotracheitis: Herpes Virus
- Infection Sinusitis: Mycoplasma gallisepticum (MG)
- Chronic Respiratory Disease: MG and E. coli
- Infectious Coryza: Hemophilus paragallinarum
- Turkey Coryza: Bordetella avium
- Aspergillosis: (Brooder Pneumonia)

RESPIRATORY DISEASES

- Difficult to distinguish viral respiratory infections in the field.
  - Newcastle, Bronchitis, Influenza
  - Laryngotracheitis (ILT) (gasping, tracheal plugs)

NEWCASTLE DISEASE

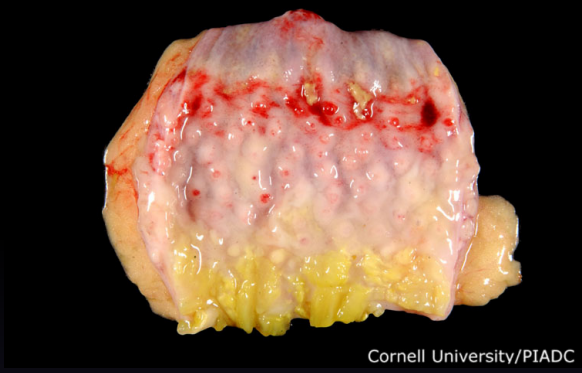
- Caused by a virus (Paramyxovirus)
  - There are 9 serogroups
  - Paramyxovirus (PMV-1), Newcastle Disease is the most important

NEWCASTLE DISEASE

Occurrence:

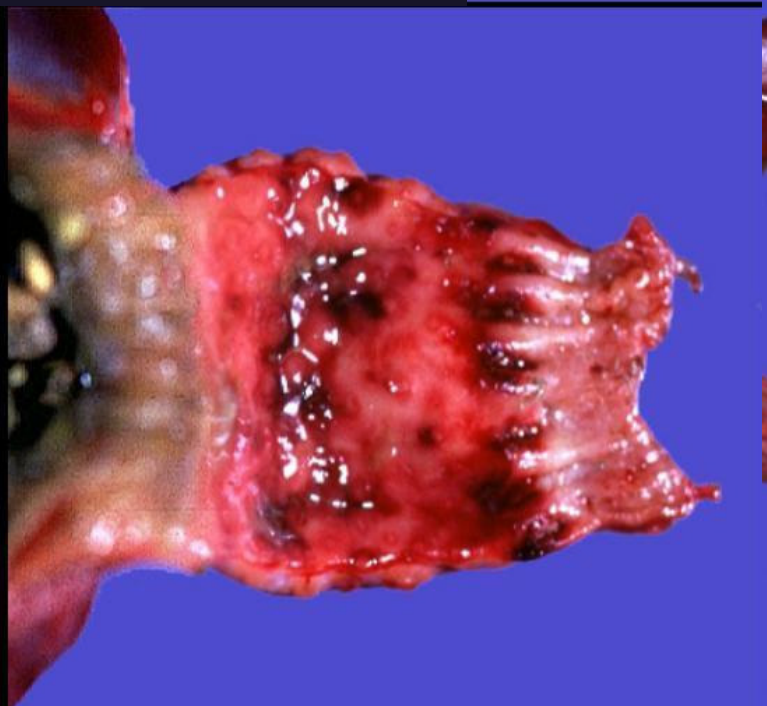
- Usually occurs in chickens, pigeons & less often in turkeys
- Most poultry and many wild & cage birds are susceptible
- All age groups are susceptible
- Humans may develop a localized eye infection [conjunctivitis] from the NDV vaccine (concentrate)

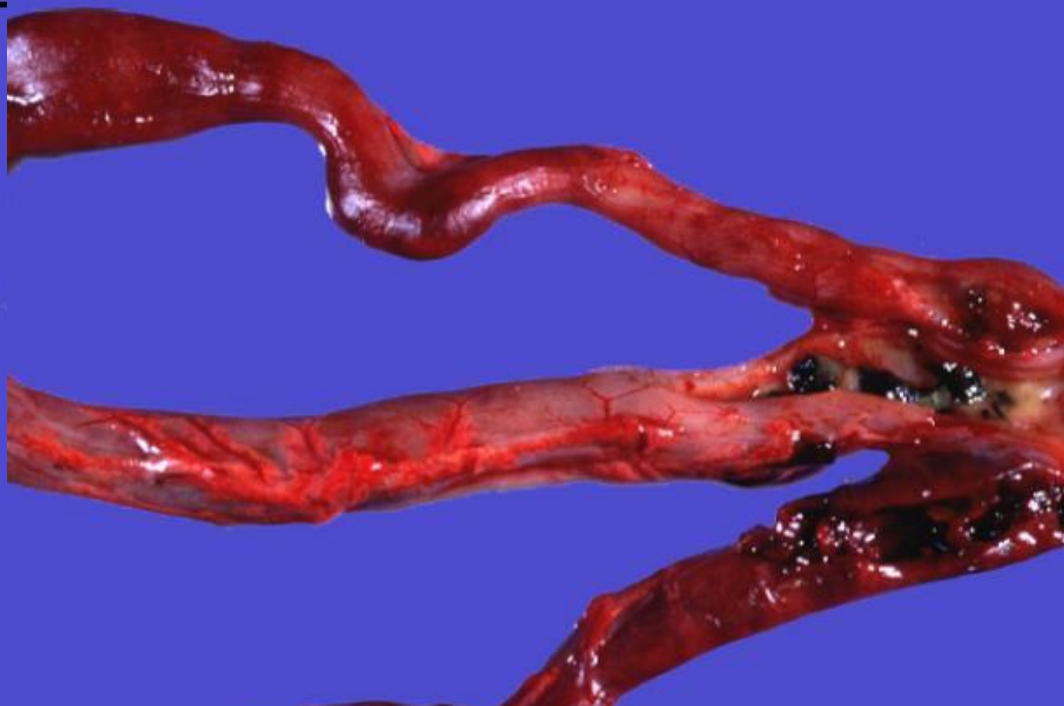
NEWCASTLE DISEASE



Three pathogenic classifications:

- Lentogenic
  - Little or no clinical signs or mortality
- Mesogenic
  - Moderate pathogenic/respiratory signs, ↓ in egg production, ↑ in mortality
- Velogenic (Exotic Newcastle, vNDV, END)
  - High mortality (up to 100%) , severe drop in egg production, CNS signs, acute respiratory distress, hemorrhagic lesions
  - (in unvaccinated poultry)





NEWCASTLE DISEASE

- Diagnosis
  - Based on history, clinical signs & gross lesions
  - Serology: paired serum samples 3 – 4 weeks apart
  - Histology (microanatomy)
  - Virus isolation (diagnostic lab)

NEWCASTLE DISEASE

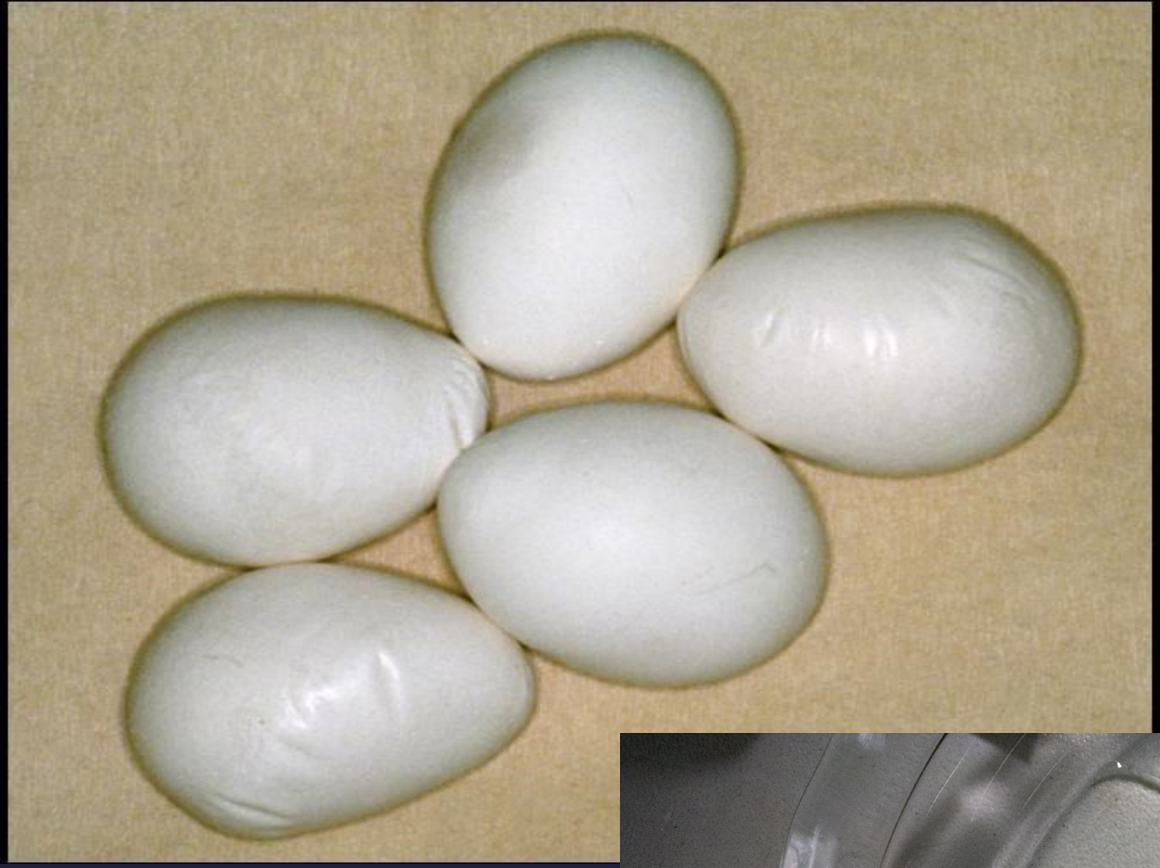
- Control / prevention
  - Biosecurity
  - No treatment
  - Vaccination (Not practical for back yard flocks)
    - Helps prevent clinical signs, reduces mortality & shedding of virus
    - Eye drop administration
      - if END in area
    - Does not prevent infection

Infectious Bronchitis

- Acute, highly contagious viral respiratory infection of chickens only (Corona virus)
- Characterized by
  - Respiratory signs [gasping, sneezing, coughing & nasal discharge],
  - a marked drop in egg production, misshapen, poor internal egg quality.

Infectious Bronchitis

- Clinical signs (can last up to 10 -1 4 days)
  - Morbidity nearly 100 %
  - Low mortality
  - Coughing, “rales”, snicking, depressed birds
  - ⬇ egg production (up to 70 %)
    - Eggshells can be soft, miss-shappened, wrinkled, water whites (albumin)



Infectious Bronchitis

- Gross lesions
- Non-specific,
  - Mild Tracheitis & airsacculitis
- Diagnosis
  - Same as NDV
- Prevention / treatment
  - Same as NDV,

Infectious Laryngotracheitis

- Causative agent: Herpes Virus
  - Gift that keeps on giving
  - Chickens only disease

Infectious Laryngotracheitis

- Clinical Signs
  - Severe dyspnea
    - Bloody exudates from nares or mouth
      - Not seen by presenter
    - Gasping, high pitch squeal,
    - Coughing & sneezing
  - Conjunctivitis (meat birds/ brown pullets
  - Spreads slowly through flock (cage systems)
  - Mild drop in egg production
  - Affects birds generally older than 5 – 6 weeks of age
  - Not egg transmitted

Infectious Laryngotracheitis

Lesions

- Hemorrhagic Tracheitis
- Cheesy Tracheal plugs
- Similar gross lesions to “wet Pox”

LESIONS (Layers):

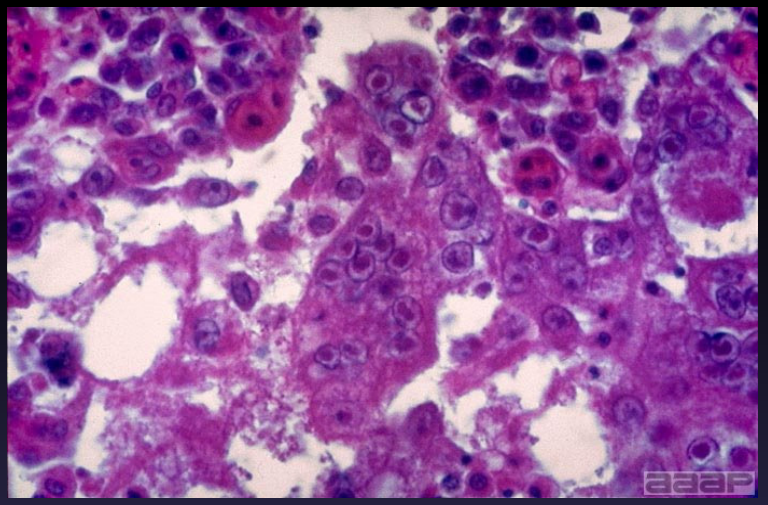
Hemorrhagic tracheitis

Lesions (Broilers):

Conjunctivitis, sinusitis, and mucoid tracheitis

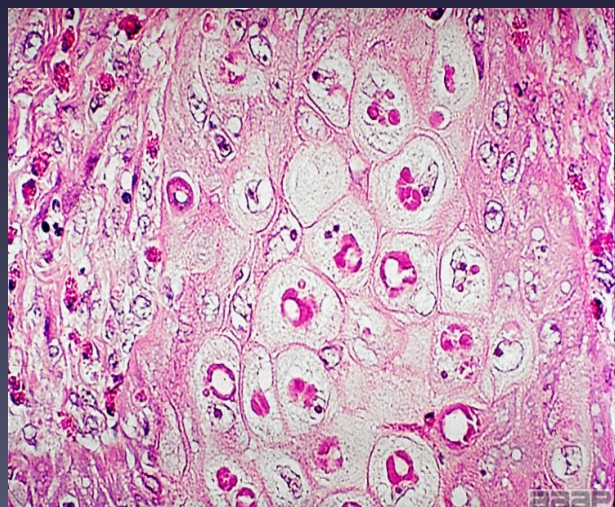
Infectious Laryngotracheitis

- Diagnosis
  - Histopathology
    - Intranuclear Inclusion Bodies
  - Virus isolation
- Treatment
  - None
  - Can Vaccinate in the face of an outbreak
    - TCO (ILT-Ivax)
      - Administered via eyedrop



Avian Pox

- Common types of Avian Pox
  - Fowl, Pigeon, Turkey & Canary Pox
- Slow spreading viral infection (Pox virus)
  - Mechanical vectors (mosquitos
  - Trauma (picking)



Avian Pox

- Dry,
  - Cutaneous lesions (black scabs)
  - On unfeathered parts of bird
- Wet
  - Oral diphtheritic lesions,
  - Associated with mortality

Avian Pox

- Diagnosis
  - Signs and Histopathology (microanatomy)
- Treatment
  - Isolate birds with scabs (treat individually)
  - Remove scab (stimulates immune response), Rx for 2° bacterial infection, scab contains live Poxvirus
    - Wear latex gloves, 1 set for each bird
  - Topical antibiotic, pine tar, alcohol
  - Vaccinate (in face of outbreak) wing-web

“Pox Take”,
Commonly seen 7 – 10 days post vaccination.

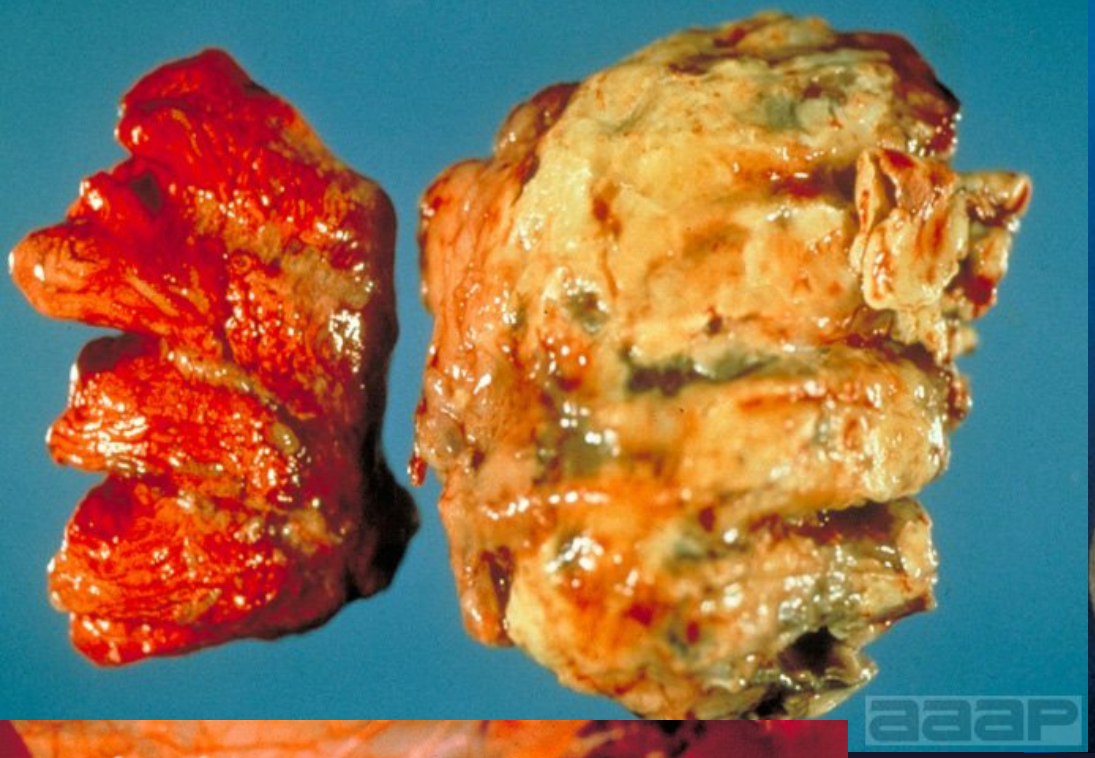
The “Take” represents the bird’s reaction and immune response to the Pox vaccine.

Pasteurella multocida
Fowl Cholera

- Bacterial disease
- Very contagious and causes high mortality
- Chronically infected and asymptomatic carriers are the primary source of infection
  - Rodents, coyotes, foxes, bob cats, raccoons, skunks, cattle, rabbits,
  - Domestic cats and dogs may also carry the infection

Pasteurella multocida
Fowl Cholera

- Signs & lesions:
  - Chickens
    - Sudden death ,abscesses, enteritis, CNS
    - Swollen wattles, joints, foot pads
- Turkeys
  - Same as chickens, plus
  - Consolidated & necrotic lung (hard lung), usually left
  - Blood in mouth (acute death), airsacculitis



Septic lesions consisting of small white foci (granulomas) in the liver and spleen.

Not specific for Cholera, common in septic bacterial infections

LIVER

SPLEEN

Pasteurella multocida
Fowl Cholera

- Diagnosis:
  - Culture for bacteria
  - Clinical signs and gross lesions
- Treatment (Rx)
  - Agribon (sulfa), Tetracycline / Oxytetracycline
  - Naxcel (injectable)

Pasteurella multocida
Fowl Cholera

- Prevention:
  - Biosecurity is the key
    - Remove flocks with history of Cholera (carriers)
    - Sound fencing
      - Bury the fence, lay a strip of woven fence on the ground adjacent to the outside part of the fence on the ground, electric
    - Avoid cattle, rabbits, mammals that eat rodents
    - Quick response to mauled birds
      - Humanely euthanize affected bird, no first aid

Salmonella

- Bacteria
  - 2,600 serotypes
- A) Host specific (Avian)
- B) Non-host specific (Paratyphoid)
  - Infects many plant and animal species
  - Ubiquitous organism (found every where)

- Food safety issue with eggs and poultry meat

Salmonella

- A) Host specific (Avian)
  - Non-zoonotic (does not infect people)
  - Considered exotic disease in U. S.
    - Infected flocks will be destroyed by government
  - NPIP for breeders, egg transmitted,
- S. pullorum (Bacillary White Diarrhea)
  - Chick mortality, asymptomatic in pullets
- S. gallinarum (Fowl Typhoid)
  - Primarily in pullets and adult poultry

Salmonella

- B) Non-Host specific (Paratyphoid)
  - Motile bacteria
  - Egg transmitted
  - Zoonotic
    - S. typhimurium, S. enteritis (SE), S. heidelberg, just to name a few
    - SE is the only one the FDA cares about (currently)

Salmonella

- B) Non-Host specific (Paratyphoid)
  - Motile bacteria
  - Egg transmitted
  - Zoonotic
    - S. typhimurium, S. enteritis (SE), S. heidelberg,
    - SE is the only one the FDA cares about (currently)
    - Food safety issues with eggs (FDA)
    - Food safety with poultry meat (FDA & USDA)

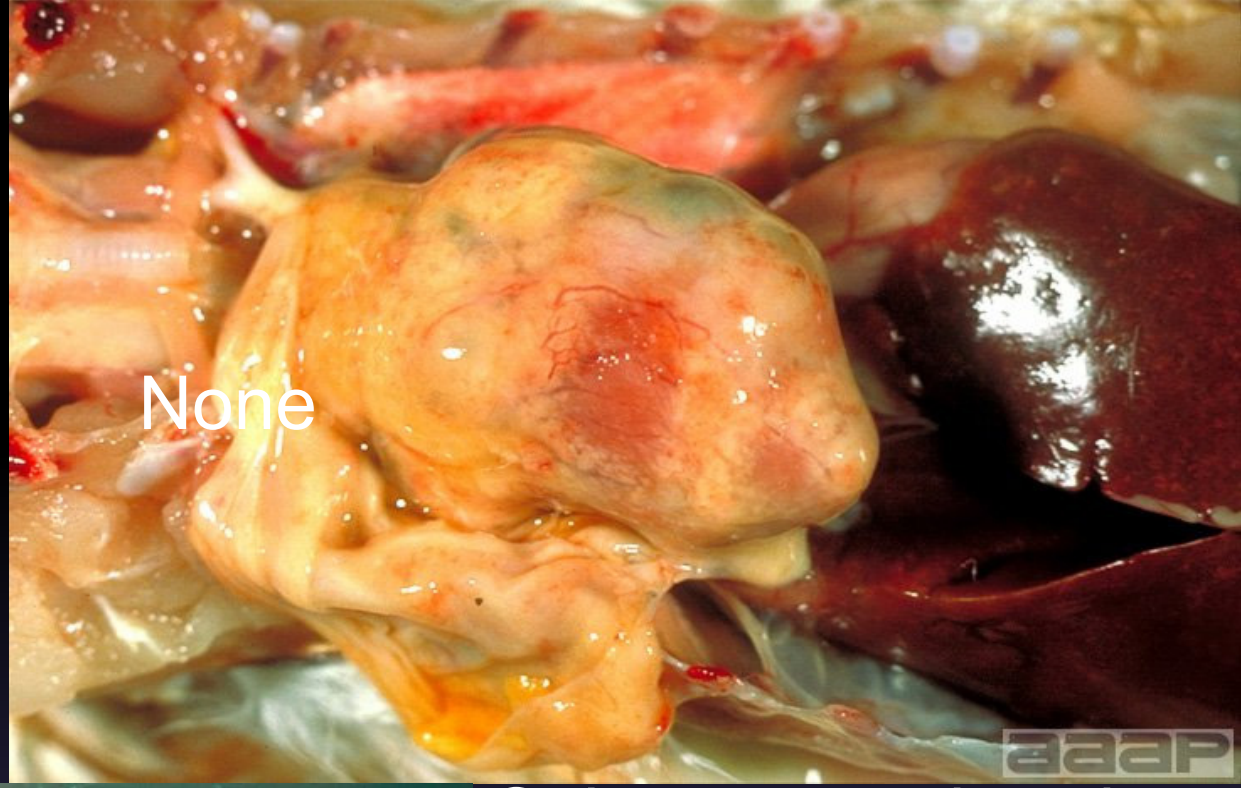
Salmonella

- Signs
  - Chicks / poults
    - Increased mortality 1 – 4 wks of age
    - Weak, pasting of vent, stunting
    - Asymptomatic
  - Adults
    - Asymptomatic, diarrhea, pale comb wattles

- Lesions:

(1° young birds)

  - –Acute



Subacute to chronic:

Cecal cores, enlarged spleen

Grey nodules in liver, spleen, intestines, cecum & heart

- Lesions (adults):
  - –1° intestinal carriers,
  - –Salpingitis

- Lesions: Paratyphoid
  - –Marked enteritis,
  - –necrotic foci on liver

Salmonella

- Diagnosis
  - Submit to CAHFS lab
  - Serology, culture
- Treatment
  - RX: Sulfa compounds, Neomycin
  - Breeders generally don't treat
    - Egg transmitted,
    - Depending on the Salmonella, flock maybe put down

Salmonella

- Prevention
  - Biosecurity / QA plan
    - Written prevention (mitigation) protocols
  - Rodent control (S. typhimurium = mouse fever)
  - C & D premise and equipment
  - Probiotics
  - Vaccination (live + killed)
  - Test & slaughter breeders
    - Egg transmitted
    - Depends on Salmonella type

"Quit complaining and eat it!... Number one, chicken soup is good for the flu — and number two, it's nobody we know."

Coccidiosis

- Occurs anywhere poultry are grown
- Seen primarily in young birds
  - Require 6 - 8 days to complete life cycle
  - Generally between 3 & 6 weeks of age
- Characterized by diarrhea & enteritis
- Associated with warm / humid conditions
  - Brooder stoves and damp/wet litter

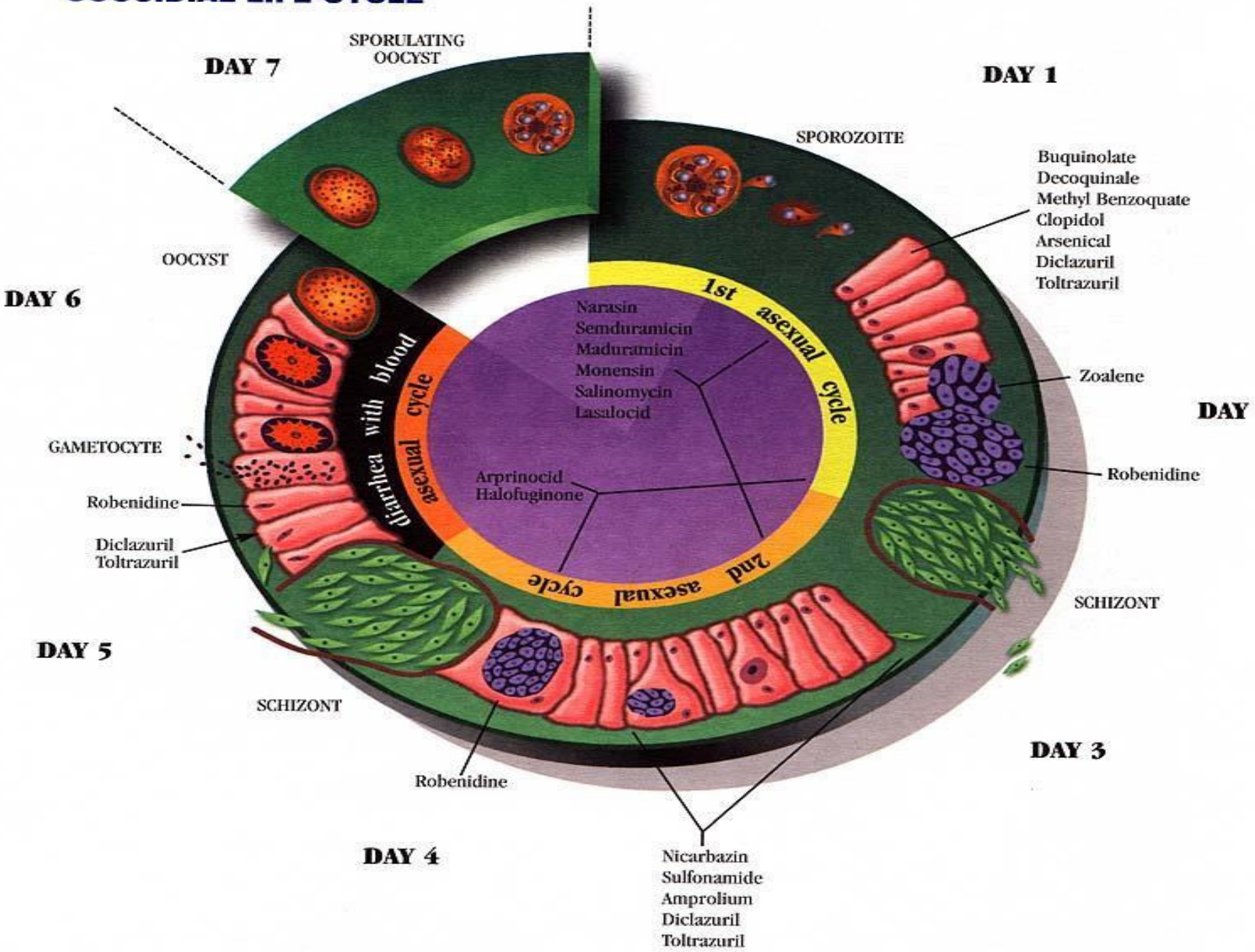
Coccidiosis

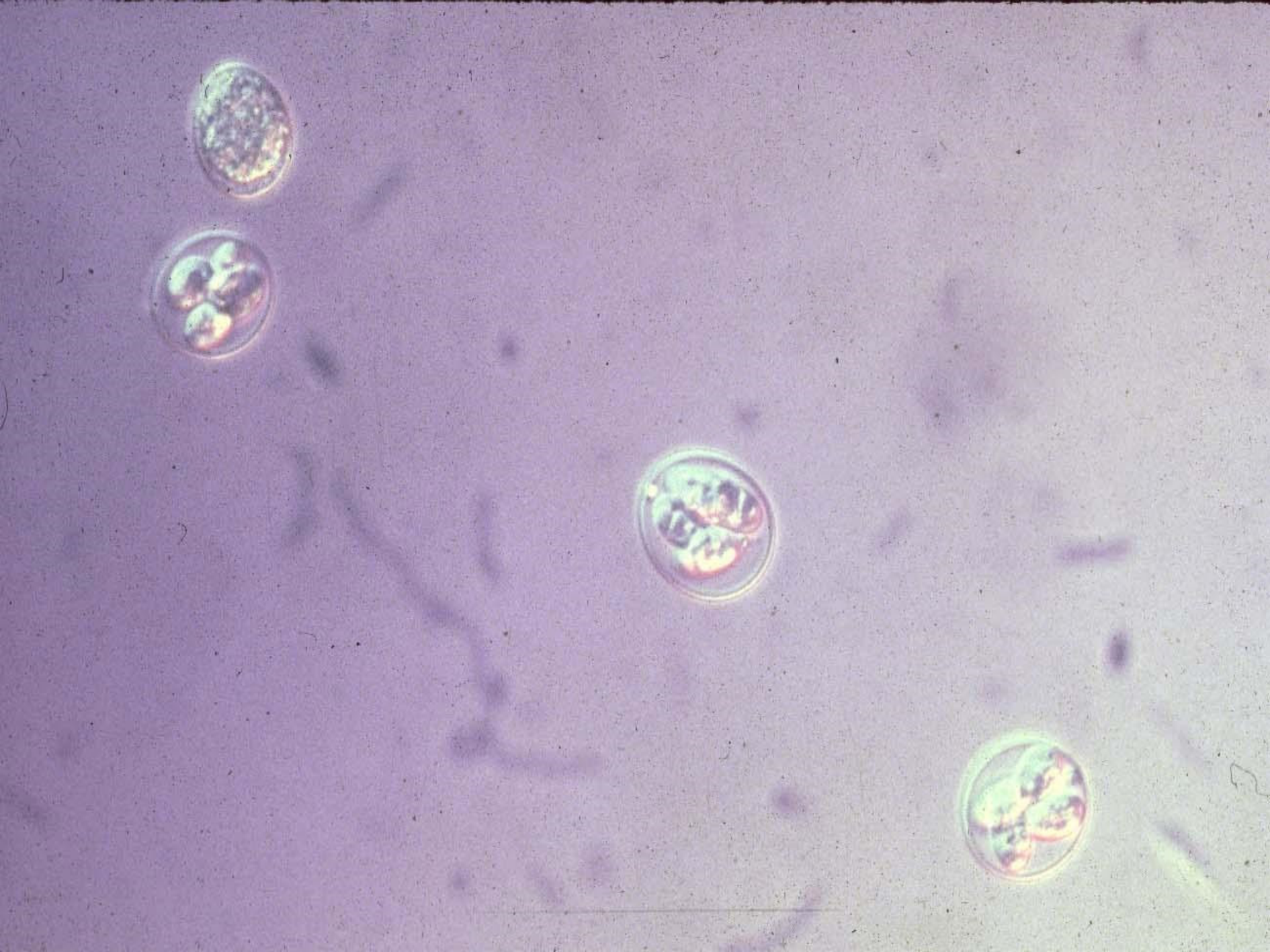
- Single cell protozoa (Eimeria genus)
  - Direct and complicated life cycle
  - Ooccyst (egg) is very resistant
    - Survives in environment for 18 + months
  - One sporulated oocyst may produce 100,000 offspring

Coccidiosis

- Nine species of Eimeria in chickens
- Five are pathogenic
  - E. acervulina, E. necatrix, E. maxima, E. brunetti,
  - E. tenella

COCCIDIAL LIFE CYCLE



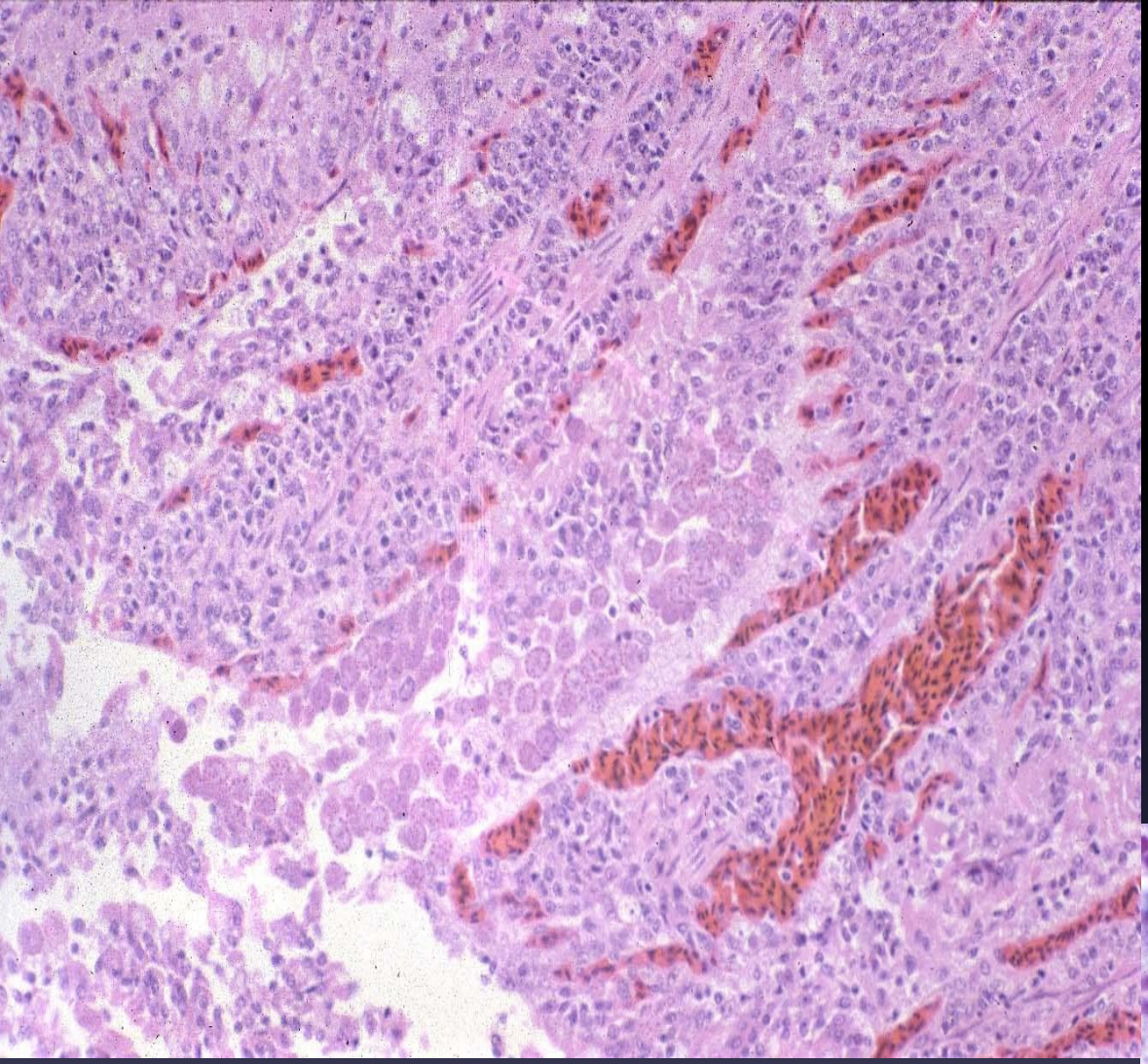


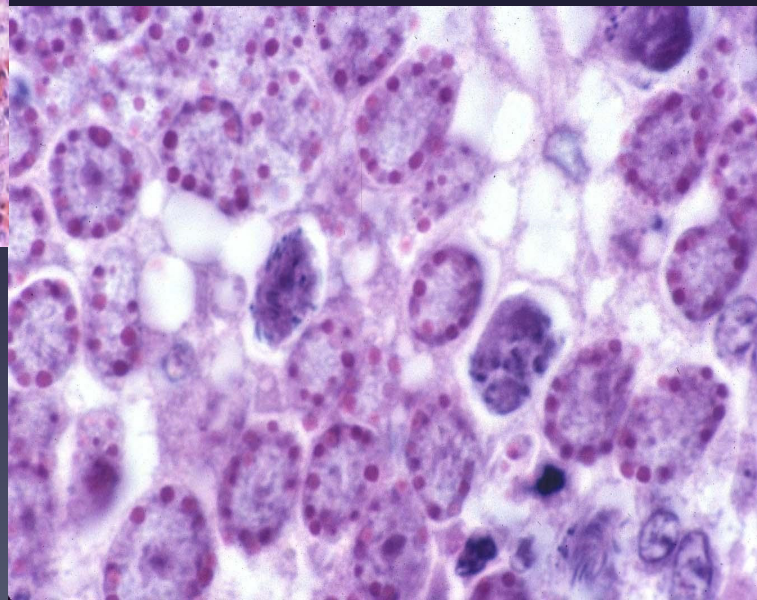
- Cool Video
  - life cycle
  - vaccine use and success

  - https://www.youtube.com/watch?v=NFh2aPmuYQE

Coccidiosis

- 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.





Coccidiosis

- Outbreaks may occur due to:
  - Poor wet litter conditions
  - Lack of immunity in chicks without an Anticoccidial drug in the feed.
    - Amprolium
  - Reaction to improper use of Cocci vaccine
    - Chicks are vaccinated at hatchery, but chicks are immunized on the farm through proper management of chick's environment.

Coccidiosis

- Clinical signs
  - Vary with each species of Cocci
  - Few or no clinical signs
  - Diarrhea (mucoid or bloody)
  - Dehydration, ruffled feathers, weakness
  - May see increase in mortality
    - Generally associated with Necrotic Enteritis
      - Sequella of Cocci infection

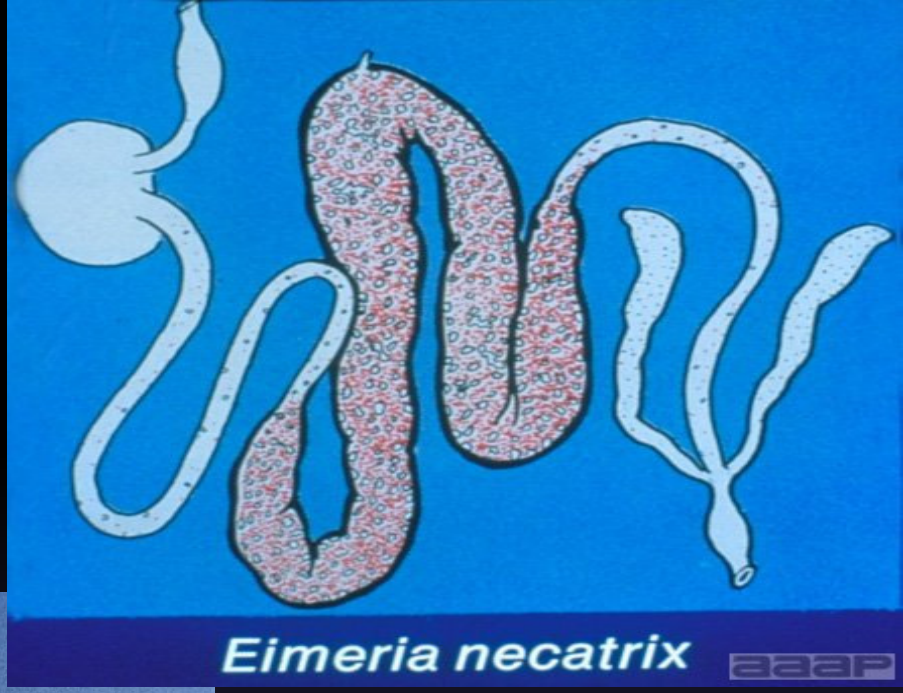
- Eimeria acervulina (moderately severe pathogen)
  - –Upper one third of intestines

Mild to severe enteritis

Thickening of mucosa.

Transverse white to gray striations or plagues on mucosa

- E. necatrix
  (severe pathogen)
  - Middle one third of intestines



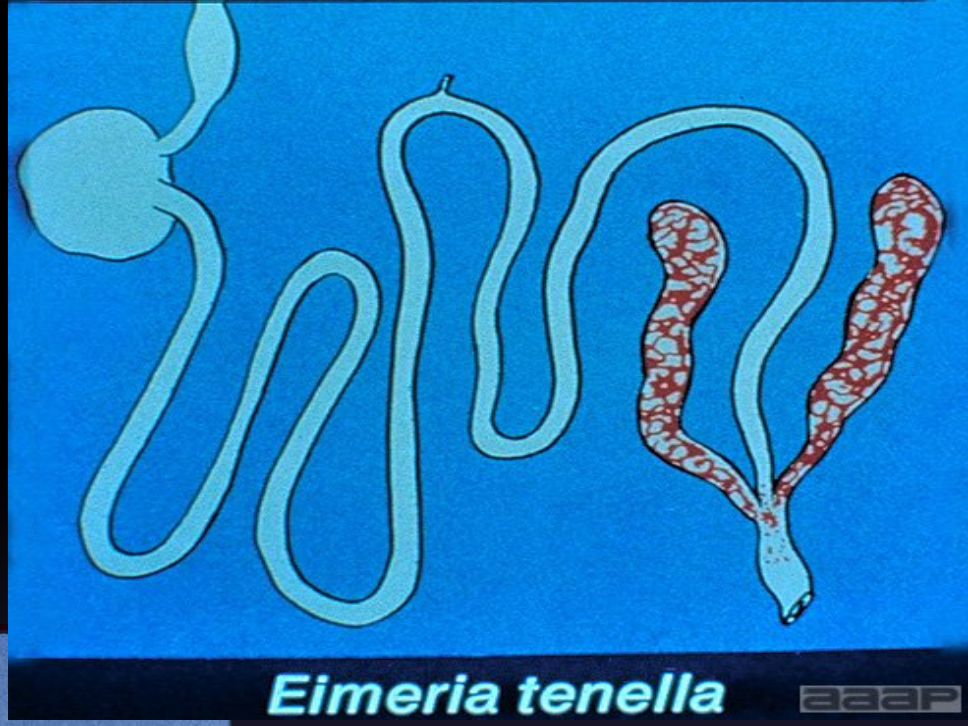
Severe enteritis, congestion hemorrhage, necrosis and bloody feces

Oocysts develop only in ceca

- E. tenella

(severe pathogen)

  - –Lower one third of intestines (Cecum)
  - –Marked typhlitis



Blood often apparent in ceca and feces, later cheesy cecal cores may be found.

Associated with high mortality

Coccidiosis

- Diagnosed
  - Clinical signs & gross lesions / Histology
- Prevention (99+% will be exposed to Cocci)
  - Develop active immunity
    - Good litter management (20-30 % moisture),
    - Exposure to moderate numbers of Cocci Oocysts
  - Use of anticoccidials in feed
    - Amprolium, Oregano
  - Immunization
    - Vaccine

Coccidiosis

- Treatment
  - Not very satisfactory
  - Amprolium - water
  - Sulfa (Agribon) – water
  - Liquid Vitamin A + K - water

Round worms

- Ascardia galli: chickens
- Ascardia dissimilus: turkeys
  - Most Common species
  - Host specific
    - Direct life cycle (28-30 days)
    - Eggs remain viable for up to 3 plus months
    - Eggs survive disinfectants (physically must remove eggs from environment


METRIC 1
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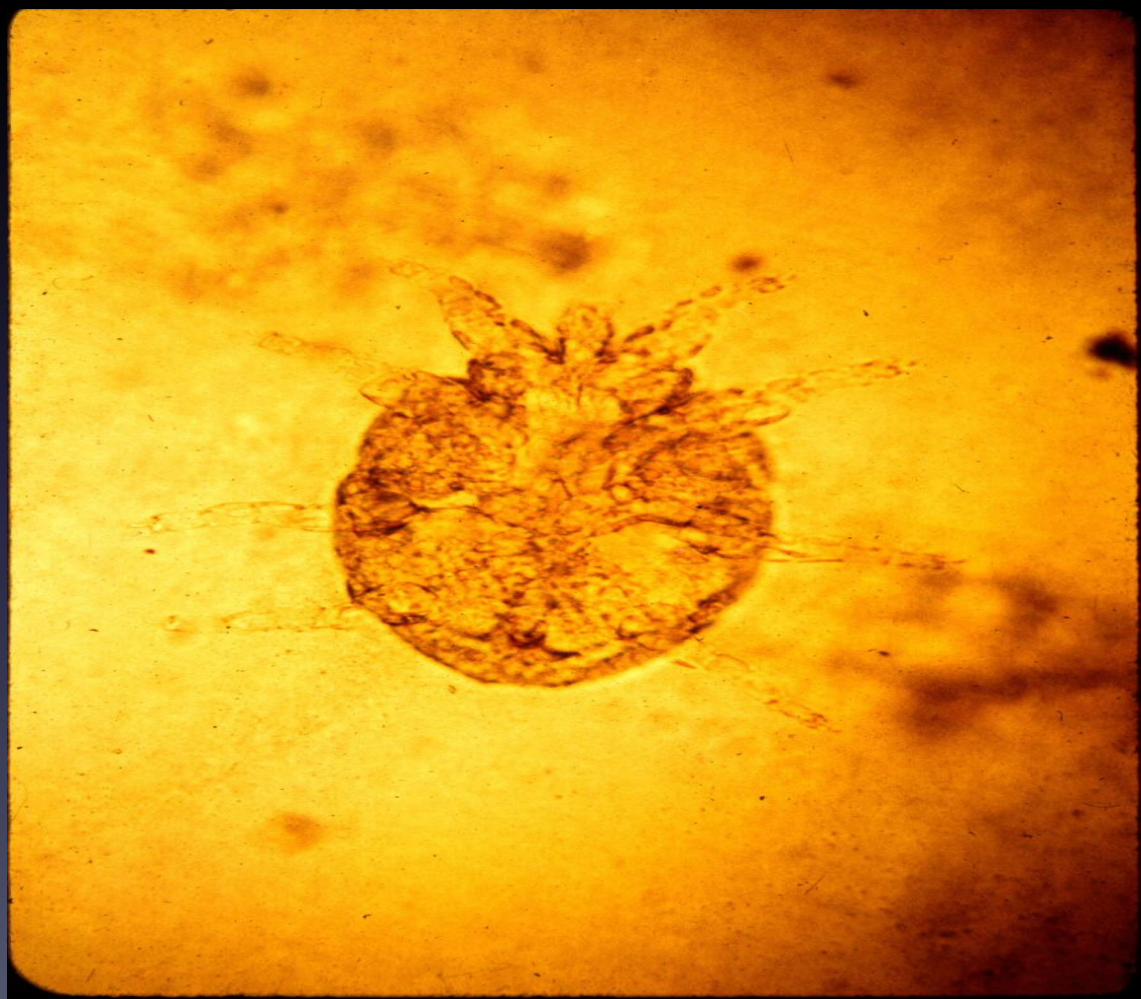
Round worms

- Lesions
  - Enteritis (small intestines, emaciation
- Diagnosis
  - Fecal float, Necropsy, histology
- Treatment
  - Check label for withdrawal time
    - If eggs / meat will be sold to public
  - Piperazine (14 day withdrawal / water), only adult worms
  - Safe Guard AquaSol® (Fenbendazole) water administration ($$$)
  - Diatomacious earth in the feed (20 lbs per ton) - helps

Mites
External parasites

- Red
- Northern
- Scaly Leg



Mites
External parasites

- Red
  - Blood suckers
    - Anemia
  - Feed at night
    - Found on birds only at night
  - Day time
    - Found in cracks / joints of roosts and barn

Mites
External parasites

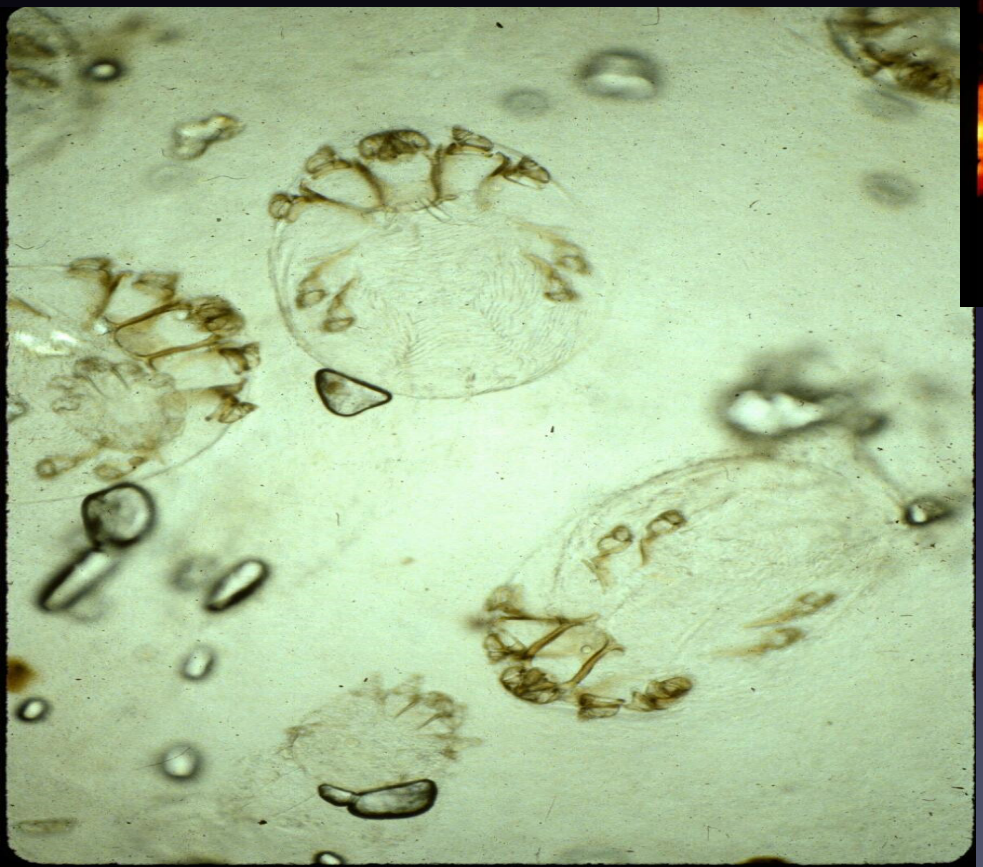
- Northern Fowl Mites
  - Blood suckers
    - Anemia
  - Stay on host continuously near vent area


MITES

- Scaly Leg Mites:

(Knemidokoptes mutants)

  - –Shanks and feet



Skin thickened and hyperkeratotic

Lice
External parasites

- Biting lice (1-6mm in length)
- Found
  - Vent area, under wings, between feather tracts
  - Very fast (Indy 500 race cars vs mites)
- Birds become unthrifty

External parasites

- Prevention
  - Assure new birds brought to farm are free of external parasites (examine the birds)
  - Control access from wild birds and rodents

External parasites

- Treatment / control
  - Spray coop with approved insecticide
  - Dust (dust box or "shake and bake" in a gunny sack
  - Spray bird(s) individually around vent area
  - Products (read the label!!!)
    - Malathion
    - Pyrethrin based insectide

Vaccination Programs

- **Program A:** *Back yard flock, but "closed" (no new introductions from off-farm).*

Vaccination Programs

- **Program A: NOTHING!**

Vaccination Programs

- **Program A - 1:**
  - *Urban farmer (farmers market, show chickens, ETC)*
  - *(Chicks come from recognized NPIP hatchery)*

Vaccination Programs

- **Program A - 1:**
  - *(Chicks come from recognized NPIP hatchery)*
  - Hatchery vaccination (day of age)
    - Marek's (HVT) plus Vectored IBDV
      - (Infectious Bursal Disease Virus)

Vaccination Programs

- **Program A - 2:**
  - *Urban farmer (farmers market, show chickens, ETC)*
  - *(Chicks are hatched on site, not from a commercial hatchery)*

Vaccination Programs

- **Program A - 2:**
  - *Urban farmer (farmers market, show chickens, ETC)*
  - *(Chicks are hatched on site, not from a commercial hatchery)*
  - *Day of age: Marek's Disease (Sub Q) back of neck*
  - *MD-VAC CFL live HVT (Zoetis)*

Vaccination Programs

- **Program B - 1:** ***Food Safety – Live program***
  - ***Day of age:***
    - ***Marek's Disease (HVT/Vectored IBD***
  - ***Day of age:***
    - ***Salmonella, live S. typhimurium (coarse spray)***
  - ***5 – 8 wks of age***
    - ***Salmonella, live S. typhimurium (coarse spray or water)***
  - ***12 – 14 wks of age***
    - ***Salmonella, live S. typhimurium (coarse spray or water)***

Vaccination Programs

- **Program B - 2:** ***Food Safety – Live / killed program***
  - ***Day of age:***
    - ***Marek's Disease (HVT/Vectored IBD***
  - ***Day of age:***
    - ***Salmonella, live S. typhimurium (coarse spray)***
  - ***5 – 8 wks of age***
    - ***Salmonella, live S. typhimurium (coarse spray or water)***
  - ***12 – 14 wks of age***
    - ***Killed Salmonella SE (IM breast muscle)*****

Vaccination Programs

- **Program C:** *All depends on the farm's / flock's health history)*
  - *These are in addition to the above programs.*
    - Pox, Infectious Laryngotracheitis,
    - Cholera, Infectious Bursal Disease,
- See your poultry veterinarian.