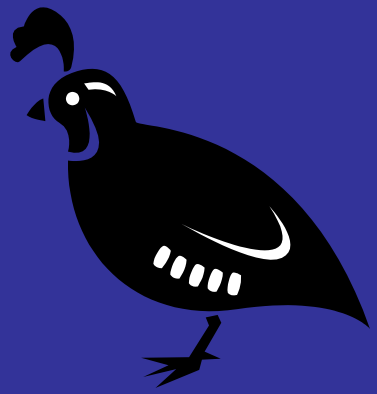
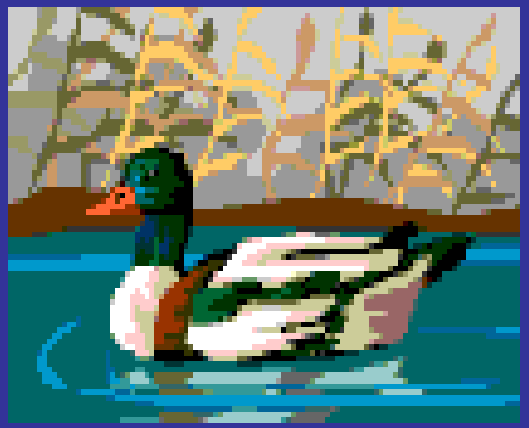



# COCCIDIOSIS IN GAMEBIRDS



# Coccidiosis in Game Birds

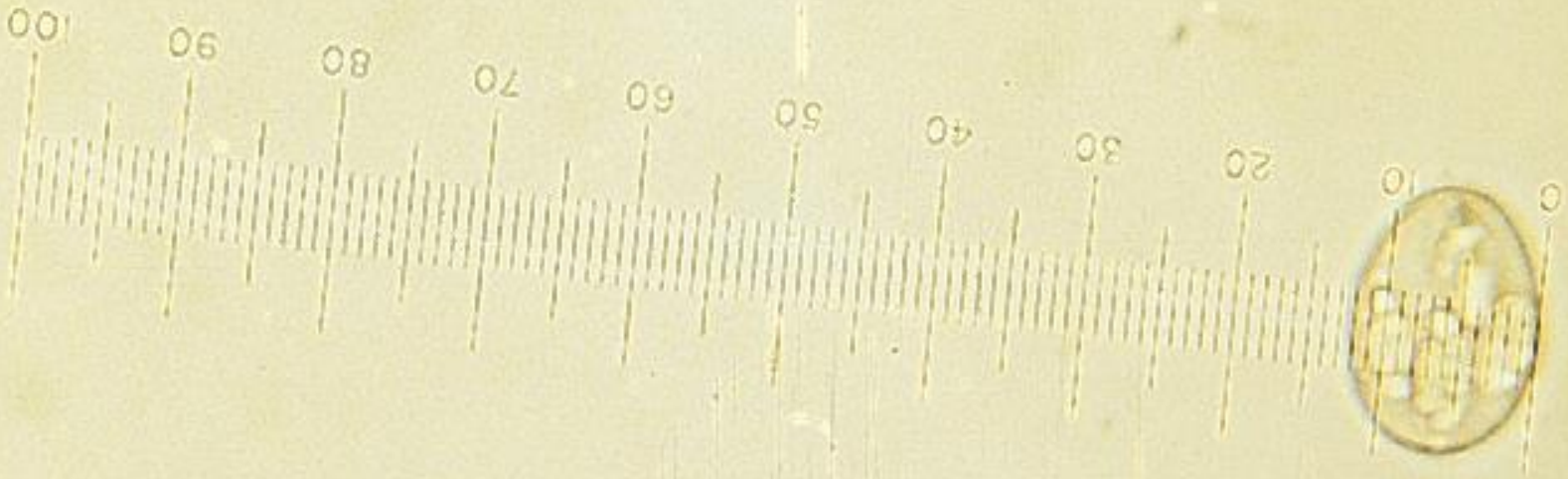
- Losses close to 40% not unheard of, especially in late season, floor-raised chukars. Most problematic in humid environments, multi-age, multi-stage units.
- Along with intestinal parasites, the single most costly disease problem in game bird production!!

# Coccidiosis

- Single-celled protozoal organisms that infect the intestines. Kidney species in waterfowl.
- They are excreted as oocysts in the droppings.
- The excreted oocysts cannot immediately infect the bird. They require **moisture, oxygen and warmth** in the environment.
- Generally resistant to disinfectants.
- Destroyed by high temperatures and ammonia released by composting litter or by freezing. Some disinfectants reported to kill them. OOCYDE??
- Mild, wet weather is ideal for cocci survival and infectivity.

# Pathogenesis

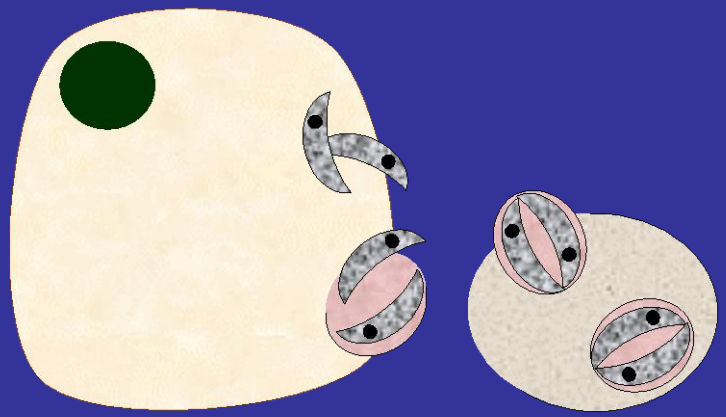
- Single ingested oocyst can result in 1 million oocysts.
- No passive immunity passed from hen to chick.
- Any age susceptible
- Development of immunity after infection with persistent low level cycling of parasite.
- Disease is everywhere birds are raised on floor




**A bird swallows a sporulated (infectious) oocyst from the litter**

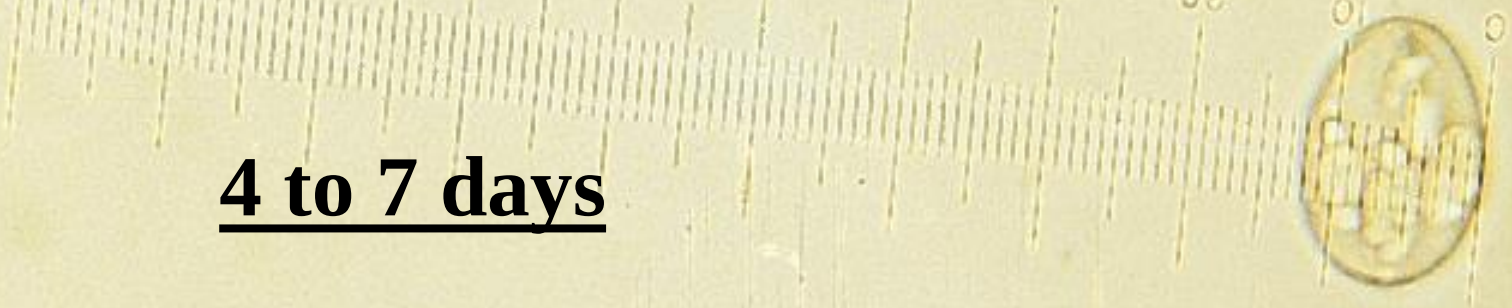
# Coccidial Life Cycle

- The sporozoites enter the intestinal lining
- They will undergo multiple generations of reproduction in the intestinal cells, causing much damage.

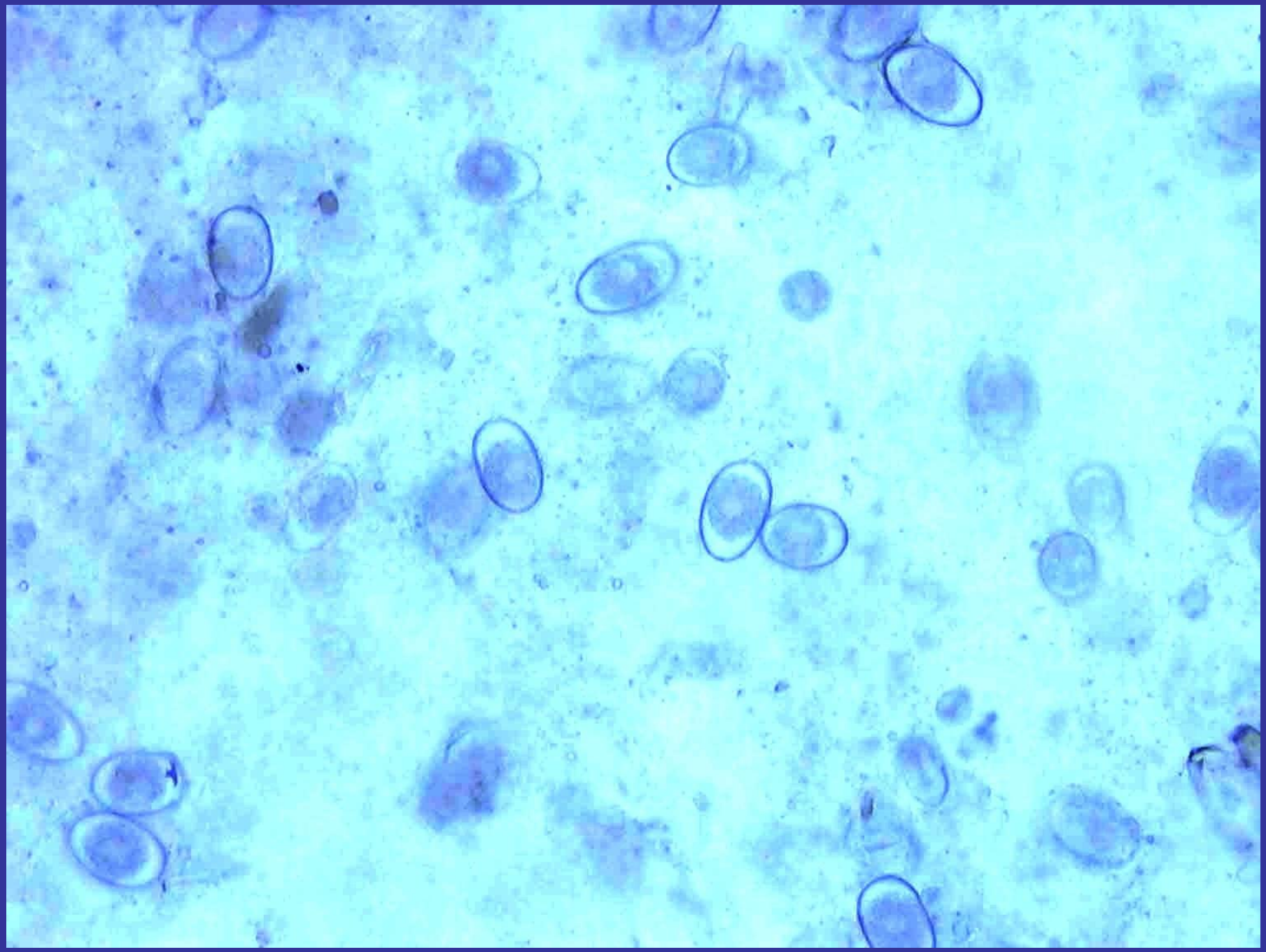



Schizonts release *millions* of merozoites which invade new cells.

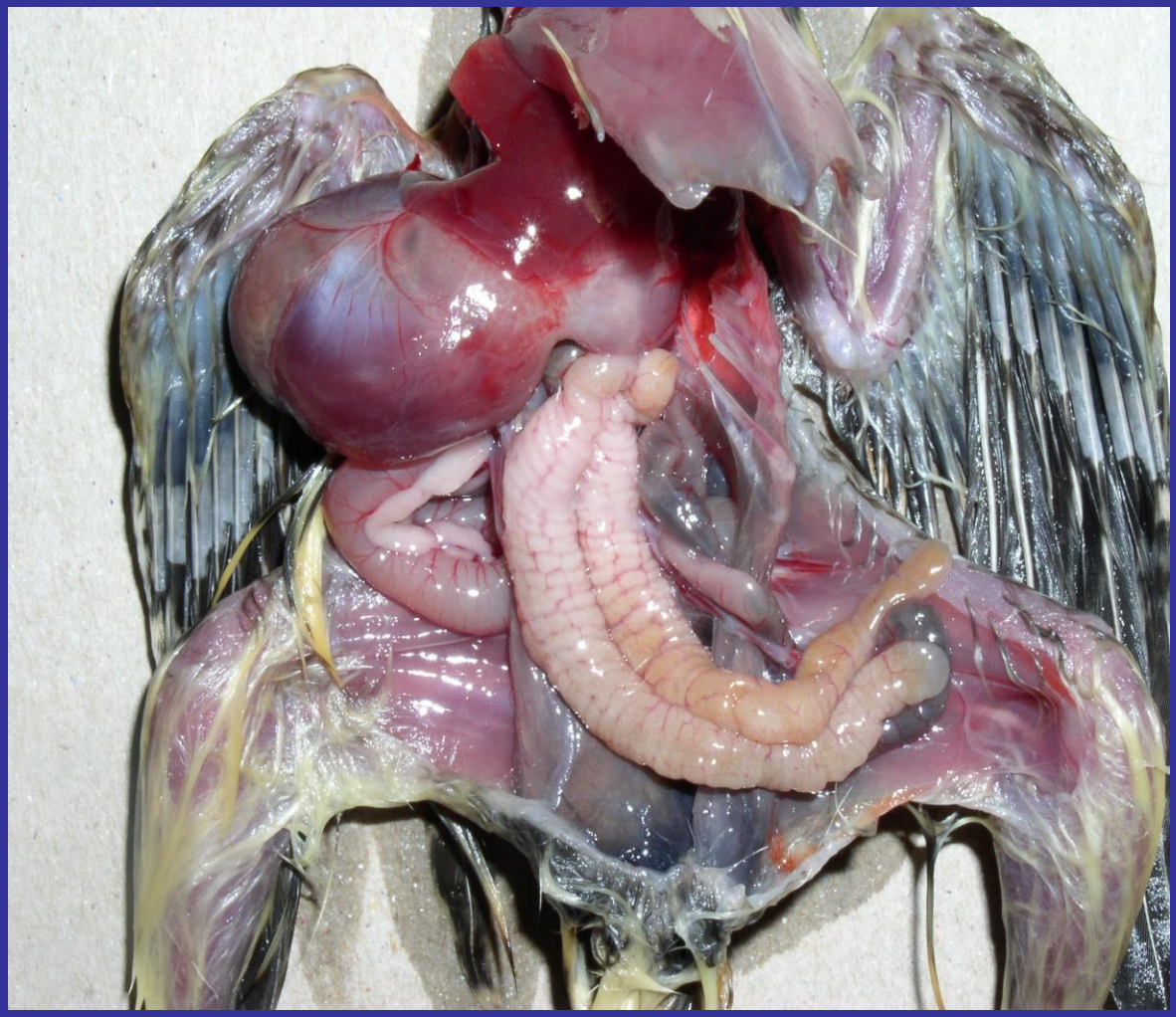
**Time from ingestion of oocyst to release (shedding) of new oocysts =Prepatent period**



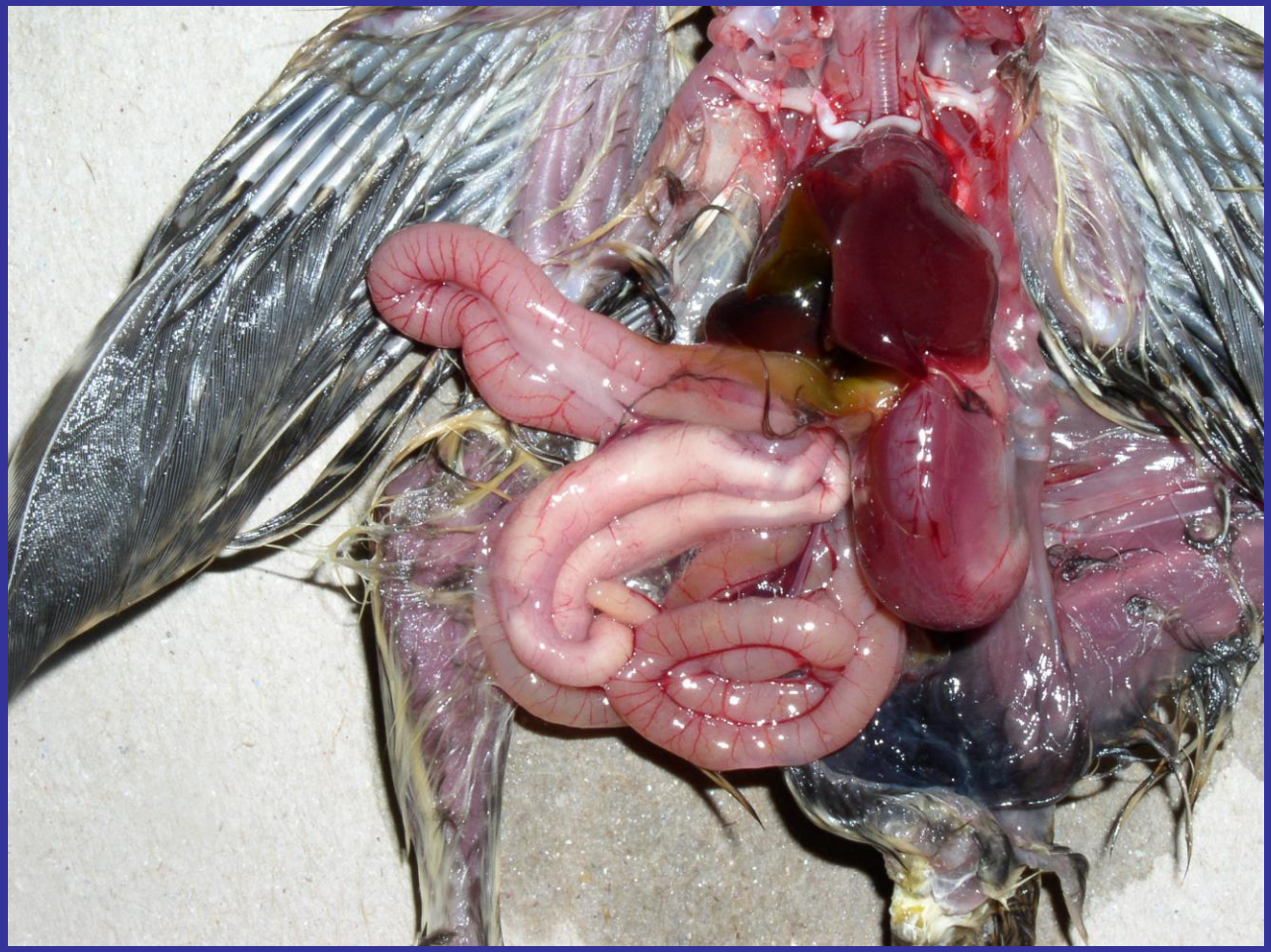
**4 to 7 days**



# Watery tan loose diarrhea: coccidiosis in chukar partridge

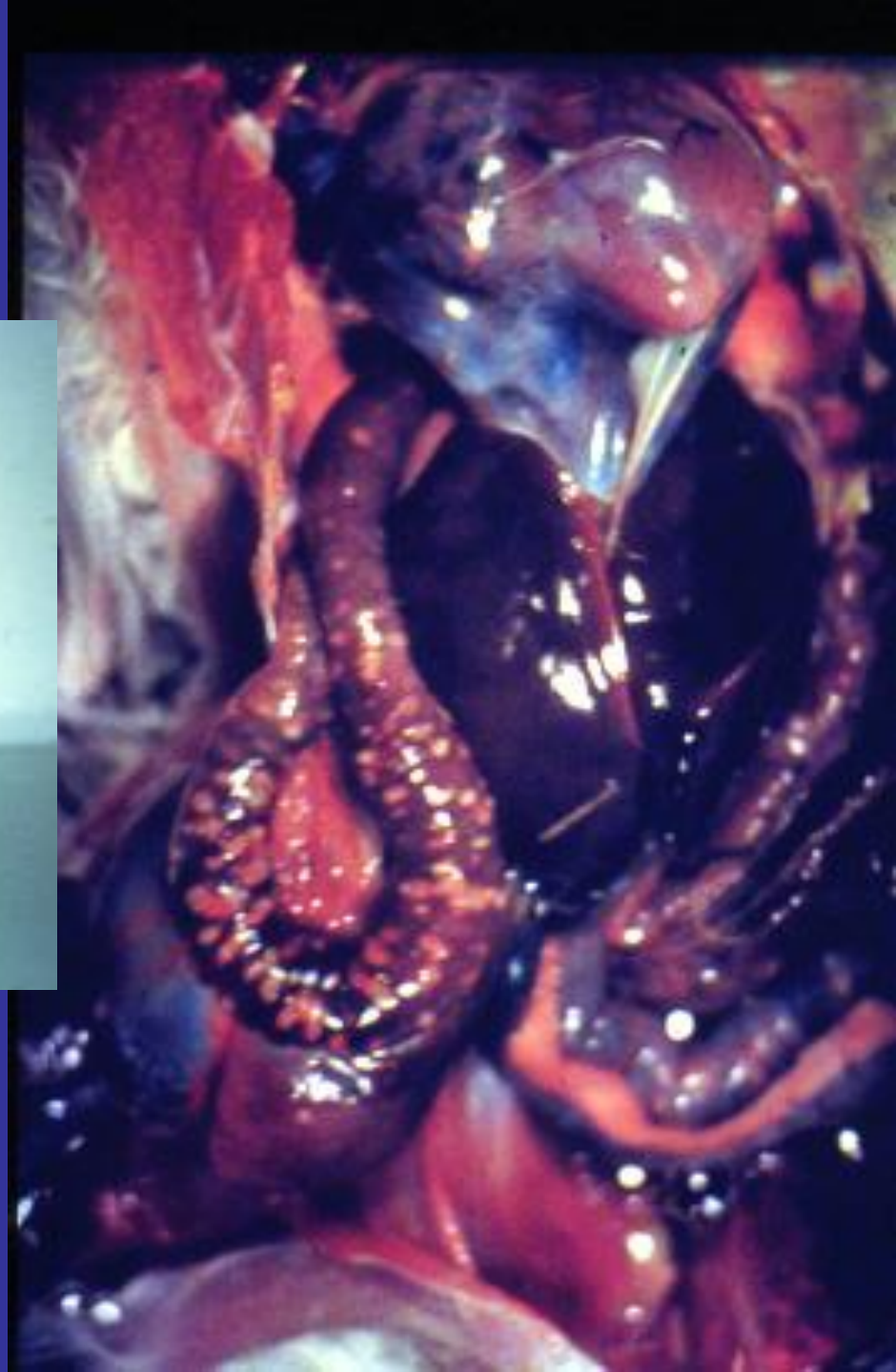


# Pheasant cecal cores due to coccidiosis



# Pheasant coccidiosis

# Quail Disease: Often preceded by coccidiosis



# Why are Coccidia Such a Problem in Game Bird Growing????

- Trend towards higher bird densities: explosive coccidia multiplication: No time for slow immunity to develop.
- Biosecurity between age groups rare on most farms. Multiple ages and manure tracking by people and equipment assure constant high cocci pressure in buildings.
- Birds (especially chukars) are not as adapted to high intensity rearing, desert species and stress-prone.  This does not favor a strong immune system.

# Coccidiosis Management

- **Goal: Reduce exposure to overwhelming doses of oocysts**

1. **Completely clean-out and disinfect brooder pens between broods. Use hot water or steam wash down.**
2. **Do not re-enter the building without dedicated boots, shoe covers, etc. People track oocysts back in!!**
3. **Foot bath and shoe change between brooders**
4. **Use a coccidiostat in the feed (see under medications approved by species).**
5. **KEEPING BROODER HOUSE DRY WITH VENTILATION, DRINKER MANAGEMENT AND OPTIMAL BIRD DENSITY IS THE KEY!!!**
6. **Practice moving from youngest to oldest birds each time.**
7. **Brood on wire if nothing else works.**
8. **Rotate coccidiostats to help prevent resistance.**
9. **Monitor disease in house through necropsies, learn to do fecals with inexpensive microscope.**

# Microscope great for parasite checks as well.

# Game Bird Coccidiosis Management

- **Preventatively give Amprolium in the drinking water weekly to slow down the multiplication rate.**
- **Ionophore coccidiostat in the feed. Continue for at least two weeks after birds on range**
- **Chemicals tried experimentally, susceptibility for 1 year, then resistance develops.**

# Coccidiosis Treatment Dilemma

- Amprolium: Dosage may need to be higher in some species. Water consumption data based on poultry, not game birds. Resistance??
- Sulfa drugs: Cumulative toxic effect if dosed several times:
  - Bone marrow destroyed; damaged immune system
  - Bleeding disorders, sepsis, coccidiosis rebound effect
  - Sulfa should never be given to egg laying breeders!!!
    - Shell damage, hatchability of eggs affected.

# Coccidiosis Prevention Medication: Coccidiostats

# Coccidiosis Control Broilers

**Ionophores**

- Lasalocid (Avatec™)
- Monensin (Coban™)
- Narasin (Monteban™)
- Semduramicin (Aviax™)
- Salinomycin (Sacox™, Bio-Cox™)

**Synthetics (Chemicals)**

- Diclazuril (Clinacox™)
- Halofuginone (Stenorol™)
- Nicarbazin™
- Robenidine (Robenz™)
- Zoalene (Zoamix™)
- Nicarb

- Nicarb+Narasin (Maxiban™)

# Currently Approved Coccidiostats (Preventatives) For Gamebirds

- Amprolium in feed approved for all
- Turkeys: Monensin, Rofenaid, Zoalene, Clinacox, Stenorol, Avatec
- Quail
  - Salinomycin (Biocox)
  - Monensin (Coban)
- Chukars
  - Lasalocid (Avatec)
  - Rofenaid (potentiated sulfa)

# NAGA's Efforts To Develop More Effective Treatment and Prevention Tools.

- Board voted in Reno to support a 2 year research project on coccidiosis prevention and control
  - Determination of coccidia species affecting N. American pheasants, chukars and quail.
  - Coccidiostat susceptibility/safety study with known broiler medications
  - Evaluate potential of coccidia isolates for development of vaccines in chukars, pheasants and quail.

# Vaccine Development

- Must have separate vaccine developed for each game bird species.
- Vaccines are comprised of live oocysts; good litter management, proper vaccination dose still critical.
- Has had great acceptance with poultry breeders, floor layer people, organic poultry production

# Administration of coccidiosis vaccines generally in the hatchery

# Gel-delivered vaccine

# Vaccine Efficacy

- Organic floor poultry
  - Cannot use ionophores, classified as antibiotics
  - Complete clean-up and disinfection between broods, new litter each time
  - Use of probiotics and acidifiers to promote gut health
  - Biosecurity (people, equipment, exposure to other birds)