

Internal Parasites of Importance to Florida Cattle
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It is generally considered that GI nematode parasitism is extreme in the southeastern United States because of year round grazing, ambient conditions of temperature and moisture that permit relatively uninterrupted transmission, vigorous cow-calf and stocker industries and the presence of nematode species indigenous to the United States.

Nematodes

1. *Haemonchus placei or contortus*

- Resides in the abomasums,
- Hematophagic
- Generally are restricted to the South and Southeastern portions of US
 - Baber pole worm
 - Large stomach worm
 - Twisted stomach
 - Wire worm
- Trichostrongyle life cycle

2. *Ostertagia ostertagi*

- Recognized as the most important nematode parasite of cattle raised in temperate climates.
- Can developmentally arrest
- Resides in the abomasums
 - Brown or medium stomach worm
- Trichostrongyle life cycle

3. *Trichostrongylus axei*

- Resides in abomasums
- Small or minute stomach worm
- Trichostrongyle life cycle

4. *Cooperia*

- Reside in the small intestine
- Significant burdens are restricted to animals 3 years of age or younger
- Not as pathogenic as other nematodes.
- Immunologically controlled by the end of an animals second grazing season

- Trichostrongyle life cycle
5. *Nematodirus helvetianus*
 - Resides in the small intestine
 - Thread necked worm
 - Trichostrongyle life cycle
 6. *Strongyloides papillosus*
 - Resides in the small intestine
 - Cattle infected by transmammary, transcutaneous, and oral routes
 7. *Oesophagostomum radiatum*
 - Nodular worm
 - Can infect transcutaneously and per os
 - Reside in the small intestine and proximal large intestine
 - Cattle do not develop a protective immune response
 8. *Toxocara Vitulorum*
 - Large round worm of cattle
 - Transmitted through colostrum and mild for the first few weeks of lactation post calving.
 - Oral ingestion of eggs by calves is non infective
 9. *Dictyocaulus viviparus*
 - Lungworm
 - Larvae ingested, become infective and migrate to the lungs
 - Lungworms occur throughout North America are most problematic in moist climates.
 - Larvae under ideal conditions can survive on pasture for 11 months.
 - Disease occurs most often in calves as cattle rapidly develop and immune response

Life Cycle in general

- On pasture GI nematode populations proceed from egg to first (L1), second (L2) and third larval stages (L3) infective stage
- Adult cow produces 4.4 times as much feces as its weanling calf
 - Cows deposit 33% more eggs on pasture than calves
 - Cow-calf pair account for 5×10^6 eggs added to the pasture per suckling period
 - 3% of voided eggs are available as infective larvae.
- Larval migration on pasture
 - 15 cm laterally (some may migrate 30 cm)
 - Zone of contamination can be affected by splashing rain, beetle activity, wind, animal traffic, pasture dragging, birds
 - 8 cm vertically
- Biological control of infective larvae
 - Fungi (200 species)
 - *Duddingtonia flagrans* has received the greatest attention (80% reduction in pasture L3 in some studies)

- Coprophagous beetles.
- Pasture longevity
 - Extremely variable depending upon
 - Nematode species
 - Moisture
 - Temperature
 - Protection from lethal actions of fungi and beetles
 - Can range from day to years.
 - Louisiana studies indicate approximately 8 months when conditions are cool and wet (October – May) die off within weeks in the summer periods.
 - Nematode longevity is longer in the Northern states. (12 months)
 - Overwintering for L3 on pasture is the norm.
 - Parasite burdens are gained early in the animals live and maintained throughout the entire grazing phase
 - Some infections acquired early do render animals immunologically refractory to further infections
 - Nematodirus
 - Dictyocaulus
 - Cooperia (after 2 years of grazing)
 - The abomasal genera persist in abundance regardless of the age group
 - Ostertagia
 - Trichostrongylus
 - Haemonchus
 - Immunological resistance to GI nematodes is a heritable characteristic with a heritability index of approximately 0.30

Economics of gastrointestinal nematode infections on the farm.

- 140 day weight gain post treatment .3 to 0.6 lbs per day improvement
- Other studies 0.2 0.5 lb per day
- Cow calf 25 to 50 lbs additional gain. ADB .25 lbs more per day over untreated controls.

Effects of Nematodes on host

- Loss of appetite
- Immuno suppression.
- Destruction of gastric glands and interference with protein digestion
- Loss of tissue fluids

Factors to consider when treating animals

- Parasites considered
 - Internally
 - External
- Dosage and wt of animals to minimize underdosing and overdosing
- Cost
- Facilities
- Time of year

- Pasture load
- Animals being treated.
- Will calves be retained or sold
- Forage systems
 - Deworming animal prior to placing on wheat pasture: will have minimal reinfection
 - Deworming calves and then placing in grass traps with other calves: will have a high incidence of reinfection
- Do older animals need treatment as often as younger animals in herd?

Coccidiosis

- Etiology is a protozoan parasite *Eimeria*
- Bloody diarrhea is a common indication of Coccidiosis
- Non bloody or white scours may also indicate Coccidiosis
- Nearly all of the *Eimeria* species of ruminants are rigidly host specific.

Pathogenesis

- Three stage life cycle for the parasite
 - First two stages within the GI tract of the host.
 - Third stage outside the body of the host .
- Requires 14 to 21 days
- Animals infected orally
- Will develop an immune response to the organism, with most ruminants older than 1 year of age having acquired significant species specific protective immunity.
- Coccidiosis usually occurs in areas crowded with animals, such as feedlots, small pastures,
- Stressful events such as weaning, crowding, shipping, food changes, nutritional deficiencies, concomitant infections with other parasitic agents and weather events such as blizzards or excessive hot temperatures appear to facilitate the development of clinical coccidiosis.
- nervous coccidiosis sometimes affects animals soon to long after clinical coccidiosis caused by *Eimeria zurenii*
 - affected animals spontaneously fall to the ground and have a spasmodic bicyclic type of leg movement with contraction of the dorsal muscles fo the neck and back causing the head to be drawn dorsoposteriorly. After a period of several minutes they spontaneously recover, and resume apparently normal function.
 - Cause is unknown but may be related to an electrolyte imbalance.

Diagnosis

- Microscopic exam of diarrhetic feces for organism
- Fecal flotation and identification of the organism.
- Feces for diagnostic analysis should be collected from animals at the beginning of a diarrhetic phase, rather than a week or two after onset.
- Coccidiosis is seldom seen in animals less than 3 weeks of age.

Control

- Minimize exposure of susceptible young animals to infective oocysts
- Administration of a prophylactic coccidiostat