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# Ruminant Parasitology

# Effects of Parasites in the Ruminant

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1. Reduce appetite & nutrition efficiency
2. Negatively impacts immune system
3. Lower conception rates
4. Decrease milk production
5. Reduce weaning weights



# External Parasites

## Lice

- *Damalinia bovis*
- *Linognathus vituli*
- *Haematopinus eurysternus*
- *Solenopotes capillatus*

## Mange Mites

- *Chorioptes bovis*
- *Sarcoptes scabiei*
- *Demodex bovis*

## Horn Flies

- *Haematobia irritans*

## Cattle Grubs

- *Hypoderma lineatum*
- *Hypoderma bovis*

## Ticks

# External Parasite Effects

External parasites like ticks can transmit blood-borne diseases and increase the disease risk for anaplasmosis, babesiosis, theileriosis, and leukemia virus in our bovine patients.

Anaplasmosis is one of the most prevalent tick-transmitted disease in the United States.

# Internal Parasites

## Gastrointestinal Worms

- *Haemonchus contortus* (adults)
- *Haemonchus placei* (adults and L4)
- *Ostertagia ostertagi* (including inhibited L4) (adults and L4)
- *Trichostrongylus axei* (adults and L4)
- *Trichostrongylus colubriformis* (adults and L4)
- *Trichostrongylus longispicularis* (adults only)
- *Cooperia oncophora* (adults and L4)
- *Cooperia punctata* (adults and L4)
- *Cooperia surnabada* (adults and L4)
- *Nematodirus helvetianus* (adults and L4)
- *Oesophagostomum radiatum* (adults and L4)
- *Bunostomum phlebotomum* (adults and L4)
- *Strongyloides papillosus* (adults only)
- *Trichuris* spp. (adults only)
- *Moniezia benedeni* (adult)

## Lungworms

- *Dictyocaulus viviparus* (adults and L4)

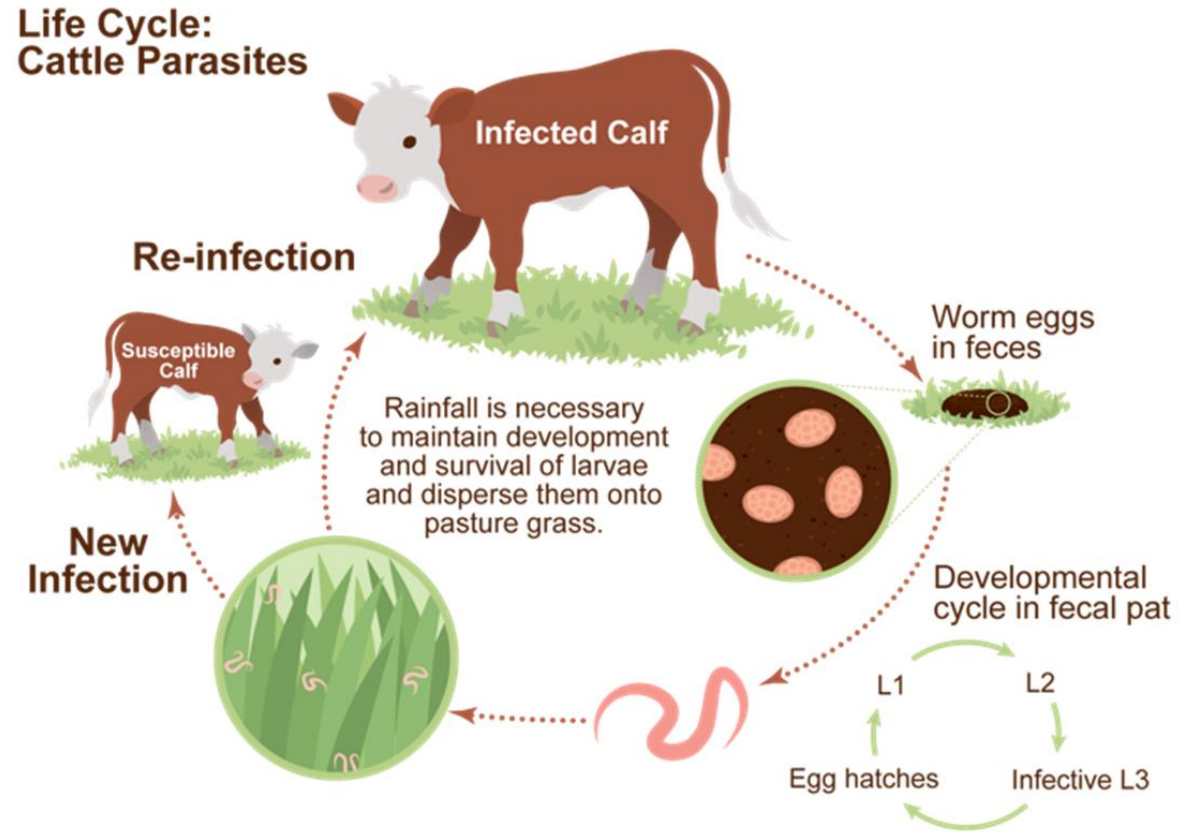
## Liver Flukes:

- *Fasciola hepatica* (adults only)

## Protozoa

- *Eimeria*

# Intestinal Parasite Lifecycle

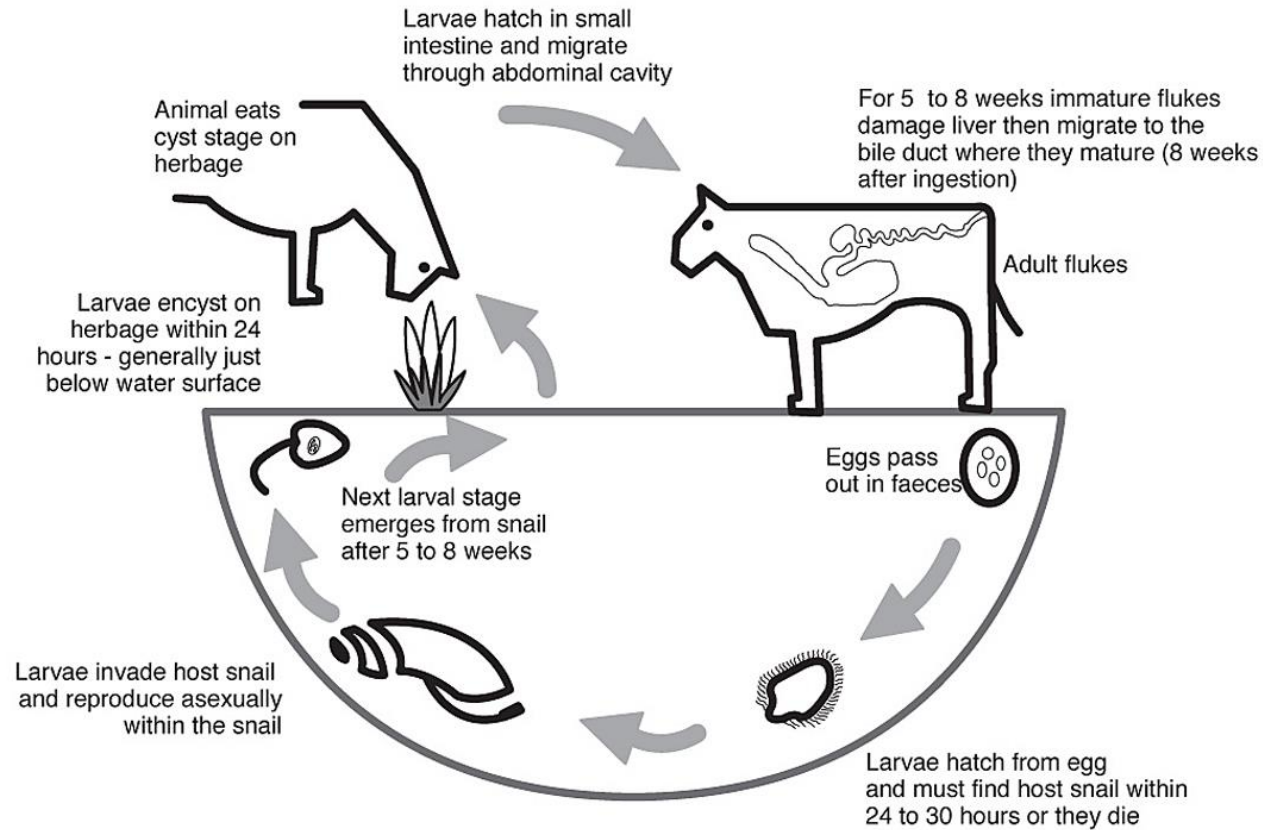


# *Ostertagia ostertagi*

- Most clinically relevant parasite in cattle. Known as the brown stomach worm.
- Larvae destroy the gastric lining and give a cobblestone or moroccan leather appearance to the mucosa.
- Inhibited L4 stages in the gastric lining are the most difficult to deworm against.
- Cattle that are infected lose significant weight and present with diarrhea.



# Life Cycle of Liver Flukes

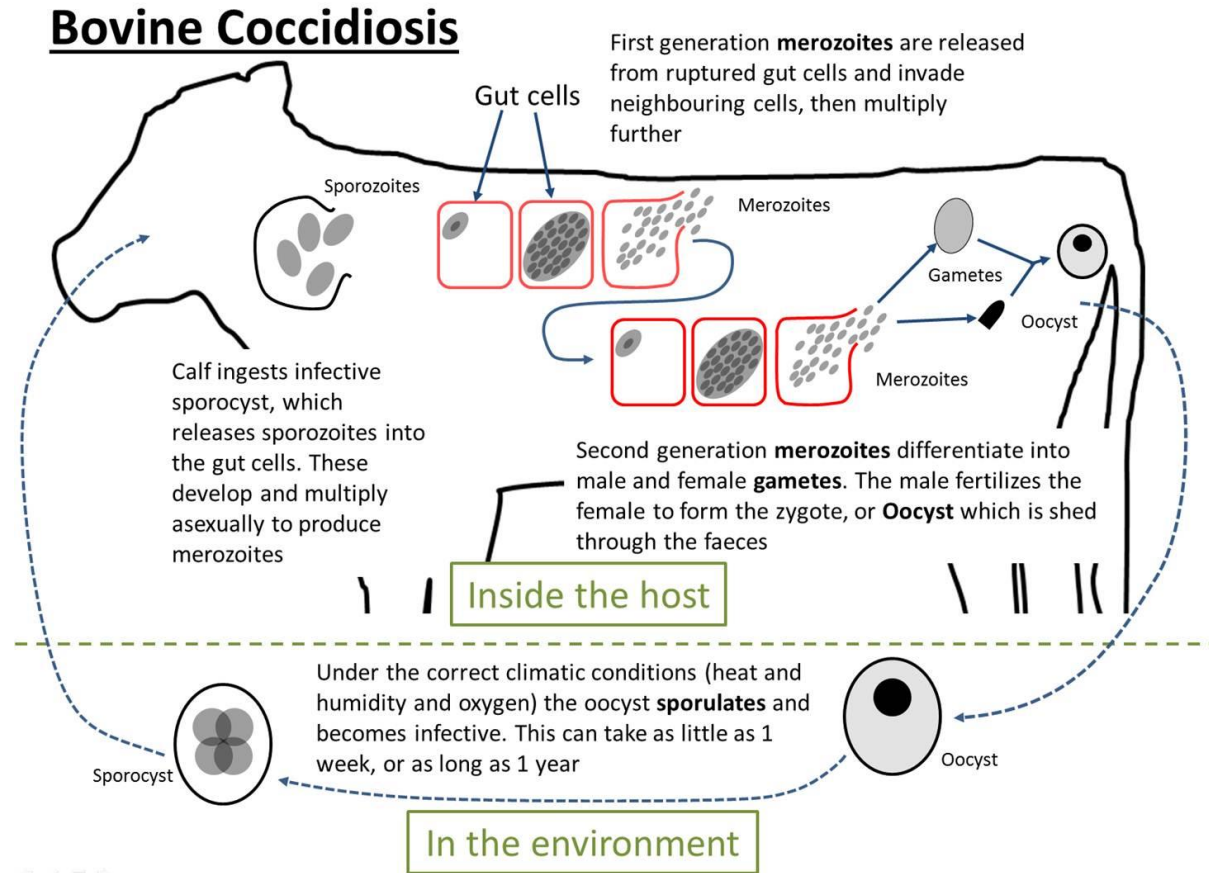


# Liver Flukes

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- Fluke infections cause economic losses in production systems throughout the world. *Fasciola hepatica*, the most important trematode of domestic ruminants, is the most common cause of liver fluke disease in temperate areas of the world.
- In the US, it is endemic along the Gulf Coast, the West Coast, the northern Rocky Mountain region. Other areas with high rainfall with poorly drained or heavily irrigated pastures could be impacted.
- The liver fluke lifecycle depends upon lymnaeid snails also known as pond snails, as an intermediate host.
- These snails like to live on the leaves of freshwater plants.
- They are commonly found near marshy land, creeks, ponds, riverbanks, and areas of standing water.

# Coccidia Life Cycle



# Coccidia (Eimeria)

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- Coccidia are single-celled obligate intracellular protozoan parasites. Oocysts can be identified in feces by use of salt or sugar flotation methods, direct intestinal smears, or a McMaster counting chamber.
- Antiprotozoal treatment can shorten the length of illness, decrease the discharge of oocysts, alleviate clinical signs, and reduce the likelihood of secondary infections and death.
- Coccidiostats in feed and mineral are helpful to prevent reinfection.

# *Haemoncus contortus*

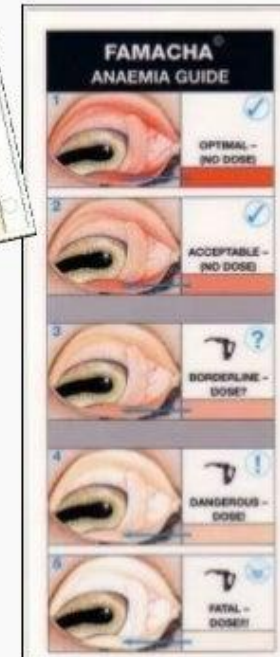
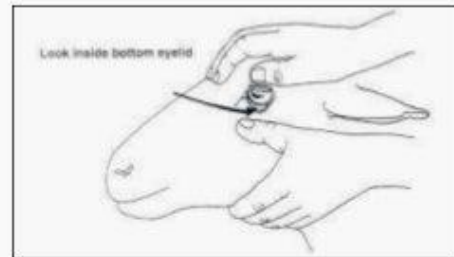
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- The barber pole worm is one of the most economically devastating parasites affecting sheep and goat production on pasture and the most common cause of anemia during the grazing season in most of the U.S.
- The parasite has a small “tooth” that lacerates the animal’s abomasal wall and feeds on the released blood. This results in anemia and in severe cases, death.
- Small ruminants usually present with
  - o Diarrhea
  - o Bottle jaw
  - o Poor body condition
  - o Dull hair coat or abnormal
  - o Weak

# Small Ruminant Assessment

## The FAMACHA® System

for assessing anemia and barber pole worm infection in small ruminants



|         | Clinical Category | Color      | PCV       | Deworm? |         |
|---------|-------------------|------------|-----------|---------|---------|
| sheep ↑ | 1                 | Red        | $\geq 28$ | No      | ↑ goats |
|         | 2                 | Red-Pink   | 23-27     | No      |         |
|         | 3                 | Pink       | 18-22     | ?       |         |
|         | 4                 | Pink-White | 13-17     | Yes     |         |
|         | 5                 | White      | $\leq 12$ | Yes     |         |

Selective deworming prolongs effectiveness of anthelmintics by reducing selection for drug resistant worms.