Parasite Management in Small Ruminants

Parasites of most concern in small ruminants (goats, sheep, etc):

- **Coccidia (Eimeria sp.)**
  - Protozoa found in the GI tract
  - Become infected from eating off the ground where the eggs are
    - Cool, damp, dirt areas – prime place for the infective larvae to survive.
  - Adult animals carry a small load of coccidian but don’t usually become clinically affected
  - Young animals, especially weaning age, become clinically affected.
  - Cause ***diarrhea***, poor growth, weight loss
  - Can prevent with feeding young stock a feed with a coccidiastat in it
    - Ex: Purina Noble Goat Grower formula, contains decoquinate which is a coccidiastat
  - Treat animals with diarrhea and a high number of eggs seen on fecal flotation with either Sulfadimethoxine (Albon) or Amprollium (Corid)

  ![Coccidia egg on fecal examination](image1.png)

- **Haemonchus contortus** (barber pole worm)
  - MOST IMPORTANT PARASITE IN SMALL RUMINANTS
  - Causes anemia and loss of blood protein, with severe disease can see diarrhea and severe weight loss
  - Come in contact with infective larvae when grazing on grass (especially wet grass)
  - Eggs are shed in feces in high number so can infect pasture quickly

  ![Life cycle](image2.png)

  - Life cycle:
  - Treatment based on management changes and only using anthelmintics on animals with high worm burden
Identifying Animals with a High Worm Load:

1. Monitor for clinical signs = anemia, submandibular edema (bottle jaw), weight loss, poor hair coat
   a. Identifying animals with anemia – FAMACHA Score
      i. Looking at relative “pinkness” of conjunctiva membrane color
         ii. A grade of 1 is optimal, and is indicative of an animal that does not need treatment. A grade of 3 is questionable so clinical signs and/or fecal egg count should be used to decide if treatment is needed. A grade 4 and 5 are very pale pink to white respectively and are indicative of an animal that needs treated as soon as possible.
   b. Fecal Egg Counts
      i. A Modified McMaster’s Fecal Egg Count is a quantitative test for measuring parasite load. It is specifically for HOTC complex species, which include *Haemonchus sp.*
      ii. Performed by taking 1 gram of feces and counting the eggs seen within the grid of the McMaster’s slide and using this formula
         1. \((\# \text{ of HOTC eggs in both grids}) \times 50 = \text{Eggs per gram of feces}\)
      iii. In a goat, an eggs per gram value of less than 1000 is considered “normal”, and anything higher is of concern.
iv. Haemonchus egg:

**Important Management Aspects for Parasite Control:**

- **NUTRITION**
  - Nutrition has been shown to have a huge impact on an individual animal's ability to keep Haemonchus in check. With a high protein diet, the host is better able to manage the negative physiologic effects of Haemonchus and produce an immune response against it.
  - It is a common misconception that goats can thrive on just pasture with minimal supplemental feeding of hay and grain. Most goats (especially dairy breeds) require grain supplementation with a high-quality grain that has at least 16% crude protein.
  - Another thing to consider in regards to nutrition is the type of forage fed to goats. Goats are meant to eat a more browse type forage than a grazing type forage. When grazing they are consuming the infective stage larvae, so keeping them in a pasture that has more browse, keeping their nose up off the ground, is best.
    - Browse = leafy weeds, brush, etc.
- **Pasture Management**
  - Now providing a browse based pasture is not realistic for a lot of producers, so a rotational grazing program on a grazing type pasture can be used to manage the parasites.
  - In a rotational grazing program, you divide the pasture into small sections, and then rotate the herd from one to the next frequently. The herd stays in one section about 5 days, and is then moved to the next section.
  - The frequency of rotating is based on moving the herd before the infective stage larvae have had time to develop and move up the grass blades. When they return to an individual section it has been about 3 months, so in an ideal world, the infective stage larvae have died off.
  - Here is an example of a pasture set up for rotating, it has a central pen for a shelter and water source and then individual grazing pens to rotate access to
• Copper Oxide Supplementation
  o Another emerging tool for parasite management is twice yearly boluses of copper oxide wire.
  o These are what the small wire particles within the bolus look like.

  o These particles stay within the reticulum (first part of the stomach) and slowly release copper oxide. Copper oxide has poor bioavailability, so the risk of copper toxicity from this is fairly low.
  o About 72% of the copper oxide remains within the GI tract, there it acts like an anthelmintic to Haemonchus. Studies have shown that copper supplementation can drop the fecal egg counts significantly in affected goats.

• Lespedeza Hay or Grass
  o New theory for parasite control
  o Research has shown significant reduction in fecal egg counts and adult worm load in goats fed lespedeza either fresh or as hay

Using Dewormers:

• Due to overuse of anthelmintics, there is a high prevalence of resistance. In some areas, the resistance is so bad that no commercial dewormers are effective
  o This is a serious problem for the industry, so judicious use of dewormers is now necessary to decrease the incidence of resistance
  o Resistance is created when a dewormer is used and a percentage of the worms are killed off but the worms that have the genetic component to not be killed by the dewormer survive and continue to reproduce. Thus this creates a population of worms that are resistant to that dewormer.

• So how often do you use a dewormer? -> ONLY WHEN AN ANIMAL IS CLINICALLY EFFECTED BY ITS PARASITE LOAD
  o Do not deworm on a schedule

• What dewormer to use?
  o Use one individual dewormer until it stops being effective in your herd.
    ▪ DO NOT ROTATE BETWEEN DIFFERENT DEWORMERS
  o Start with a lower tiered dewormer
    ▪ Ivermectin
      • Dosage 6 mL/26lbs
    ▪ Fenbendazole (has a high resistance incidence, does not work most of the time anymore)
      • Dosage: 10 mg/kg
- Valbazen (avoid in pregnant animals)
  - Dosage: 20 mg/kg
  - Save the “big guns” for animals that have not responded to other deworming attempts
    - Moxidectin
      - Avoid in young animals and super thin animals (high risk of toxicity)
      - 0.4 mg/kg
    - Levamisole
      - Dosage: 15 mg/kg
  - ALWAYS give oral dewormers, pour-ons and injectables are poor choices for treating Haemonchus
- How do you know if your dewormer was effective:
  - Fecal Egg Reduction Test
    - This is done by performing a fecal egg count 7-14 days after treatment, and comparing that to your pretreatment count.
    - A reduction of greater than 90% is indicative of good efficacy of the anthelmintics used. If the reduction is less than 90% then you have resistance to that anthelmintic.