



# CAMELID STRONGYLE ANTI-PARASITIC RESISTANCE GUIDELINES

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This guideline from the American Association of Small Ruminant Practitioners serves to assist veterinarians with enhancing the welfare of their client's camelids by providing guidance related to strongyles and the associated resistance, with particular emphasis on *Haemonchus contortus*. Essential to this process is that consultation occur between the herd veterinarian and the client regarding herd parasite burden, herd parasite management techniques, and the judicious use of dewormers, as well as alternative therapies. The use of written, herd-specific protocols to document these discussions is encouraged. Such protocols should be reviewed on a regular basis.

## WHAT IS RESISTANCE AND WHY ARE WE CONCERNED ABOUT IT?

Parasite resistance to common dewormers is becoming more of a problem in the camelid population. Due to this rise in resistance, more and more animals are succumbing to large parasite loads, causing an increase in mortality in herds. The overuse of dewormers has led to this significant problem. If we continue to use dewormers at this rate, we will reach a point when no dewormers are efficacious on a farm.

## COMMON CAUSES OF RESISTANCE

- Frequent deworming (more than three times a year)
- Under dosing the dewormer being used
- Reducing refugia

## WHAT IS REFUGIA?

**REFUGIA** "Proportion of the worm population that was not exposed to the dewormer. This includes eggs and larvae on pasture at time of treatment and the worms in animals that were not dewormed" Refugia is a good thing! It increases the number of susceptible parasites to our current dewormers so that we are not left with only resistant parasites.

## COMMON PARASITES ENCOUNTERED ON A CAMELID FARM

There are many parasites encountered on

camelid farms, especially with regards to geographic location. Strongyles include a wide group of parasites, commonly causing diarrhea and anemia (*Haemonchus*). There are also a few non-strongyle parasites to keep in mind when discussing parasite management, which can cause diarrhea and weight loss.

Strongyles: *Haemonchus*, *Ostertagia*, *Teladorsagia*, *Trichostrongylus*  
Non-strongyle: *Moniezia*, *Trichuris*, *Coccidia*

## HAEMONCHUS CONTORTUS

Also known as the barberpole worm, this parasite is thought to be the most pathogenic worm because it feeds on blood. Camelids ingest the infective L3 larvae on the pasture. L3 then molts to L4 where it can consume 0.05 mls blood per worm per day.

To put in perspective: an alpaca typically has a blood volume of 3.5L. If one worm consumes 0.0014% of blood per day, 1,000 worms can consume 1.4% of blood per day. Without worm control, the alpaca can become critically anemic in a short amount of time (*Llama and Alpaca Care*).

## CONTROL/MONITORING OF PARASITE INFESTATIONS

The best way to control parasites on a camelid farm is through monitoring with fecal egg counts (FEC), FAMACHA scoring, and body condition scoring (BCS). Fecal egg counts can





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be run either by the clinician or producer. Only animals with a high FEC, poor BCS, and high FAMACHA should be dewormed to reduce the chance for parasite resistance as well as increase refugia. Periodically, farms should have a fecal egg count reduction test (FECRT) to determine the efficacy of the dewormers utilized on their farm.

### FECAL EGG COUNT REDUCTION TEST

- A fecal is performed on a group of animals, preferably at least 8-12 animals.
- A repeat fecal is run 10-14 days later on the animals originally tested.
- Egg count reduction is calculated to determine the percentage of worms killed by the dewormer.

### CALCULATION

$$\frac{(\text{pre deworming FEC}) - (\text{post deworming FEC})}{(\text{pre de-worming FEC})} \times 100\%$$

A FECRT of 90% or greater demonstrates that your dewormers are effective.

### ALTERNATIVE THERAPIES

Currently, many farms utilize chemical dewormers but due to resistance there is an increased need for alternative therapies. Current alternative therapies include *Sericea lespedeza*, copper oxide wire particles (COWP), BioWorma, and pasture rotation. Currently, diatomaceous earth has not been scientifically proven to work.

**SERICEA LESPEDEZA** contains condensed tannins (CT), which has an anti-parasitic effect, mostly associated with *H. contortus*. Can be fed as pasture, hay, or pellets. Has been shown to have a significant reduction in FEC (up to 88%). It's best to feed  $\geq 50\%$  SL in the diet continuously for anti-parasitic effects.

**COWP** This has not yet been studied in camelids but is frequently used in sheep/goats. The copper particles lodge in the abomasum where they cause damage to the adult worm of *H. contortus*. This product only works on ADULT worm populations, not the immature larvae populations. Use the smallest dose possible, usually 0.5-1 gram for young animal and 1-4 grams for adults, to decrease the risk of copper toxicity. COWP should only be used a couple times a year during the grazing season.

**BIOWORMA** nematophagous fungi which traps infective larvae in the feces, therefore reducing the parasite load in the pasture. Should only be used a preventative and not to treat severe worm infestations. Currently available through Premier 1 Supplies.

**PASTURE ROTATION/MANAGEMENT** keep stocking density low (about 5-7 animal per acre) and remove manure as much as possible. Preventing over-grazing is beneficial as most worms are found in the first few inches of grass blades. Pasture rotation is best when the pasture is rested for an appropriate amount of time, based on geographical location. Generally, a pasture should be rested 2-3 months. Co-grazing of other livestock (besides small ruminants) is encouraged to decrease the worm burden on the pasture.

**NUTRITION** Nutrition of the camelid plays an important role in parasite management. Proper nutrition helps improve the immune system so that the animal can become resilient to parasites. Protein is especially important for parasite resilience and helps improve the animal's immune response as well as repairing damaged intestinal tissue caused by parasites. Furthermore, when an





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an animal is severely debilitated with parasites, their feed intake is reduced, which negatively affects their ability to fight off the infestation. Continuing to monitor body condition scores in the herd can help determine which animals may need nutritional supplementation. Be sure to separate debilitated members of the herd and feed them separately so that they are not being outcompeted for food by other members of the herd.

### SUMMARY

Control of gastrointestinal parasites in camelids takes a multi-factorial approach with both the veterinarian and owner/producer on board, including performing FECs to determine parasite load, selectively treating affected animals, and increasing refugia on the farm. The focus of parasite control needs to shift from using chemical dewormers to utilizing alternative therapies due to the high prevalence of worm resistance. For more information, visit [wormx.info](http://wormx.info), a great resource for veterinarians and owners for parasite control in camelids.

Approved by the AASRP Board of Directors January 2022



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