

# Small Ruminant Gastrointestinal Parasite Management <sup>1</sup>

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## Abstract

This article is meant to provide small ruminant producers with an overview of gastrointestinal parasite management concepts. Gastrointestinal management is a multifaceted approach and varies from one operation to the next. Producers should have a working relationship with a veterinarian. Diagnosis, treatment, and prevention do not always follow the same course of action because each scenario is typically different. Close monitoring of the herd or flock is paramount to ensure the animals' good health, and proper record keeping is required for best management practices.

## Introduction

Florida has the optimal climate for gastrointestinal parasites. High humidity, high temperatures, and frequent precipitation provide a preferred environment for the larvae of parasites to complete and maintain their life cycle. As a result, gastrointestinal parasitism is the most common management challenge for small ruminant producers. Having a protocol in place to monitor your herd or flock for gastrointestinal parasites and to manage them is pivotal to the success of the operation. In Australia, the associated annual economic costs related to gastrointestinal parasitism are estimated at 1 billion USD. Costs are expected to be

tens of billions of dollars globally (Roeber et al. 2013). Due to immense worldwide challenges with anthelmintic (dewormer) resistance, there is a heightened emphasis on finding and utilizing alternative strategies to control gastrointestinal parasites. Parasites can affect small ruminants of any age; however, they are particularly detrimental to young animals and animals that are stressed, resulting in immunocompromise.

The most common nematode parasites that affect small ruminants are nicknamed the "HOT Complex." Those parasites include *Haemonchus*, *Ostertagia*, and *Trichostrongylus*. *Haemonchus contortus* is of the utmost concern in our small ruminant species and is commonly referred to as the barber pole worm due to the larvae's red- and white-striped appearance. This parasite can cause sudden death in small ruminants due to the severe anemia that manifests in the host. Diagnosis of nematode infection can be done by observing clinical signs, utilizing the McMaster's fecal egg count (FEC), and/or performing a necropsy. The associated clinical presentation often involves anemia, poor performance, weight loss, weakness, diarrhea, and/or death.

There is evidence of worldwide anthelmintic resistance in small ruminants (Kaplan 2004). Therefore, small ruminant producers should not mass treat their herd or flock on a schedule as was previously recommended. The goal is to

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maintain a level of parasites within the population that have not been exposed to dewormers, essentially “creating a refuge.” Refugia is the concept of maintaining this portion of internal parasites that are not exposed to dewormers. This is accomplished by only administering dewormers to those animals that need it, not the entire herd or flock. This unexposed population of parasites will result in a delay of the evolution of anthelmintic resistance.

## Gastrointestinal Parasite Treatment Strategies and Tools

A targeted selective treatment (TST) approach is the current recommendation for assessing and treating small ruminant herds for internal parasites. The TST concept involves treating only the animals that require or would benefit from deworming. In general, 80% of the parasites in the herd or flock are harbored by 20% of the animals. Therefore, fecal egg presence is not evenly dispersed in the flock.

The TST program involves utilization of the Five Point Check®, the FAMACHA® system, and performance indicators of individual animals in the herd or flock. Implementation of a scheduled evaluation of each animal in the herd or flock is advised. Ideally, this evaluation will take place every 2–4 weeks throughout the year. The Five Point Check® is a tool used to evaluate the overall health of the herd or flock and determine if a particular animal would benefit from deworming (Table 1). These health indicators can be directly influenced by parasite pressure.

**Table 1. The Five Point Check® system for small ruminants** ([www.wormx.info/changingdogma](http://www.wormx.info/changingdogma)).

Five Point Check® System for Small Ruminants			
Number	Point	Indicator	Which Parasite(s)?
1	Eye	Paleness	Barber pole worm, liver fluke, coccidia
2	Back	Body Condition Score	All
3	Rear	Fecal Soiling	Brown stomach worm, hair worm, thread worm, nodule worm, coccidia
4	Jaw	Bottle Jaw	Barber pole worm, liver fluke
5	Nose	Nasal Discharge	Nasal bots

The second tool, FAMACHA® scoring, is directly related to point 1 in the Five Point Check® system. FAMACHA® is an acronym derived from the originator of the system, Dr. Francois “Faffa” Malan. This technique involves evaluating the animal’s mucous membranes (conjunctiva) of the eye to measure anemia status on a five-point scale (1 being

red, with adequate blood volume; 5 being pale, white, and severely anemic). Simply put, it is a rapid animal-side evaluation that is an inexpensive assessment of anemia used to evaluate the impact of barber pole worms. Accuracy of the assessment is highly dependent on the color comparison of the conjunctiva to the FAMACHA® score card. Producers must receive training and a certificate of completion from an online or in-person training to receive the FAMACHA® cards. The American Consortium for Small Ruminant Parasite Control (ACSRPC) website has more information at [wormx.info](http://wormx.info).

The McMaster’s FEC is a quantitative fecal exam primarily used to estimate the extent of parasite egg contamination on pastures. This test can be used to help determine which animals in the herd or flock are shedding the most parasite eggs. It is also a useful tool to determine the efficacy of anthelmintic treatment called a fecal egg count reduction test (FECRT), which is usually done 10–14 days post-deworming. For more information regarding McMaster’s FEC, consult Ask IFAS publication VM266, “Guide to Performing McMaster’s Fecal Egg Count for Small Ruminants,” at <https://edis.ifas.ufl.edu/publication/VM266>.

## Alternative Management Strategies

Cleanliness, sanitation, and proper biosecurity are imperative to minimize parasitism on-farm. Keeping feed and water areas dry and free of fecal material can help protect small ruminants from parasite infections. Feed and hay should be fed in such a way that animals are not able to stand in those feed materials while eating the supplements; ideally, animals will always eat up off of the ground. Providing proper nutrition supports the animal’s appropriate body condition and helps to maintain immune system function, which will result in a greater ability to reduce parasite burdens.

Copper oxide wire particles (COWP) can be used to aid in GI parasite control; however, they should not be utilized as the sole method of control. This product has been shown to reduce barber pole worm infections in small ruminants. There is a concern for copper toxicity in sheep, so it is generally recommended only for goats, but it can be used in sheep with careful consideration. Prior to administration of this product, consult with your veterinarian to assess the status of copper in your region and within your animals. Additional resources regarding COWP administration may be found at <https://www.wormx.info/copper-oxide-wire-particles>.

Although the mode of action is broadly unknown, consumption of tannin-rich forages has also shown effectiveness in controlling *Haemonchus* infection. Tannins are naturally found in forage legumes and can be added to a rotational grazing program. *Lespedeza* is not allowed in Florida because it is potentially invasive, but Sunn hemp, clovers, and birdsfoot trefoil may be other options. For more information regarding condensed tannin forages, consult Ask IFAS publication SS-AGR-440, “Condensed Tannins in Forage Legumes,” at <https://edis.ifas.ufl.edu/publication/AG440>.

Management of current pasture can also be a helpful tool for the mitigation of gastrointestinal parasites. About 80% of infective larvae (L3 stage) live within the first 2 inches of the forage. Close grazing to the ground equates to a greater likelihood of consuming parasites. Barber pole larvae can survive on pasture 90–180 days in ideal weather conditions. The addition of rotational grazing to pasture management can improve forage production and allow time for the death of parasitic larvae. Producers should aim for a minimum of 30 days’ pasture rest, if possible. Fortunately, the period with the highest parasite larvae activity coincides with the highest forage production in Florida (i.e., the hot, humid, and rainy summer). This makes it easier to rest pastures for longer periods, but it may necessitate mowing to manage forage quality. It is a best practice to carefully establish a stocking rate that is going to provide sufficient forage height to minimize livestock contact with infective larvae.

Selection for resistant animals is another management strategy. Culling animals from the herd or flock that consistently have high parasite burdens can greatly reduce the amount of parasite larvae that remain on pastures. Through the use of FEC, producers can assess which animals carry the largest loads of parasites. Additionally, some animals have a natural ability to suppress their parasite burden. It is helpful to keep animals in the herd or flock that are genetically able to resist parasite populations but also are not going to shed large amounts of parasite eggs on the pasture, even if they remain healthy. Accurate record keeping and the utilization of those records to make culling and management decisions are paramount to make this strategy effective.

## Other Gastrointestinal Parasites to Consider

Other gastrointestinal parasites to keep in mind are coccidia (*Eimeria*) and *Moniezia*, both of which more commonly affect lambs and kids than mature sheep and goats. Coccidiosis is often characterized by diarrhea that

can include blood. It is transmitted by fecal contamination, so keeping feed and water sources clean is important. Isolation of sick animals will minimize the spread of coccidia. Including coccidiostats in feed during stress periods (e.g., during weaning or when in a feedlot) is a management strategy that can be utilized. Consult with your veterinarian to make sure this is the best option for your operation. Treatment of clinical cases of coccidiosis requires a prescription from a veterinarian. *Moniezia* is the tapeworm that is mostly harmful to lambs and kids. Clinical signs may include diarrhea; some lambs or kids may develop a potbelly appearance and look emaciated in severe cases. The tapeworm is the only gastrointestinal parasite that can be seen with the naked eye, not requiring a microscope for diagnosis. This parasite is usually only a problem if the burden becomes severe.

## Conclusions

It is critical that small ruminant producers develop a routine for regular assessment of gastrointestinal parasite burden within their herd or flock. In Florida, evaluation of each animal is recommended every 3–4 weeks in the winter and every 1–2 weeks in the summer. Only a small portion of the herd or flock should require treatment at any one time. Having an FECRT performed by a veterinarian to determine which dewormer has the best efficacy on your operation can be useful. Consistent and good nutrition will also aid animals’ ability to resist parasite infestation. Assessment of nutritional status can be performed by evaluating body condition score (BCS) on each animal regularly ([BCS Fact Sheet](#)), ideally at the same time of FAMACHA® scoring. With proper management, small ruminant producers can avoid further development of resistance to dewormers and prolong the efficacy of these products. It is imperative to keep accurate records, perform herd or flock monitoring, and involve the veterinarian in management decisions.

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