



Your support of our advertisers helps support GoatWorld!



CONTROLLING GOAT PARASITES -- IS IT A LOSING BATTLE?

By: [By Anne Zajac, DVM, PhD](#)

Virginia-Maryland Regional College of Veterinary Medicine
Virginia Tech, Blacksburg VA 24061

[About the Author](#)

Send this Page to a Friend!

Friend's Email:

Your Email:

Please Help Rate This Article

Rated **4.3** by **144** responses.

No, it's not a losing battle, but unless producers give this issue some thought and attention, the victories can be few and far between. One of the biggest health problems faced by goat producers in the southeast and south central U.S. is worms. We have all become accustomed to having several highly effective drugs to select from for the treatment of worms, but as the level of parasite drug resistance increases, these drugs are not the easy solution they once were. Drug resistant worms are spreading and drug companies are not developing new products. As a result, goat owners must begin thinking more creatively about how to effectively control worms in their animals. No longer can we recommend control programs based on drug treatment alone that will be satisfactory for most producers. You must design an integrated parasite control program because the numbers of worms, their impact on your goats and their level of resistance to drugs will vary from farm to farm.

What are the most important worms?

The most important worm parasites are the gastrointestinal trichostrongyles. This is a whole family of worms, but the really important one is the barber pole worm (*Haemonchus contortus* -- it causes many goat deaths every year. This is a bloodsucking parasite that causes anemia but usually not scouring. Some other near relatives of the barber pole can cause scouring, but are not the annual cause of disease and death that barber pole worm is.

In order to use anthelmintics (dewormers) and other means of parasite control most effectively there are some fact about the life cycle, which are important to understand.

1. Adult female worms produce eggs that are passed in manure. Larvae hatch out and go through several stages of development in the environment before they can infect the next host.
2. During the warm months of the year enormous numbers of larvae can build up on your pasture.
3. Virtually all these worms need grass for successful development; they do not successfully develop on dirt. The success of larvae outside the host depends on the climate. Moisture and warmth are necessary for development and survival. Barber pole worm does not survive cold winters well, but in eastern Virginia with its mild winters there will be less loss of larvae over the winter. Dry weather is very hard on these larvae once they are out on the grass.
4. *Haemonchus* larvae can also undergo a process called ARRESTED DEVELOPMENT where they sit quietly in the stomach following infection and don't become adults until several months later. This is an important adaptation for keeping the worm around through cold winters when eggs and larvae don't survive well on pasture. The worms that became arrested in the fall resume development in the spring and reproduce.

This information can be used in several ways to target parasite control for times of the year when it will have the greatest impact.

Controlling Barber Pole Worm and its Relations

Worm parasites are a part of the natural goat world. We can't eradicate them as long as goats are on pasture. The goal is to maintain the parasites at a level that will not produce any illness or economic loss.

Because the problem of drug resistance is steadily increasing it is important for each producer to look at his/her management system as a whole and find things beside drugs that will help control parasites and create an integrated pest management program. Remember, anytime we rely on a single product or method of control the worms will eventually adapt and outwit us.

If you can include some of the following techniques, your need for frequent deworming treatments should be reduced.

1. Check Your Goats

With some parasites, like coccidia, signs of scouring will alert you to a problem. With barber pole worm there is no scouring but there is anemia with pale mucous membranes. Get into the habit of checking the color of the membranes around the eye-this is the easiest place to see anemia and will alert you when a problem is developing.

2. Let Your Goats Browse.

Goats are browsers in comparison to sheep, which are predominantly grazers. That means that goats can be found sampling plants at all levels while sheep are more strictly grass eaters. Barber pole worm and similar parasites will be found on grass. Allowing goats to browse on other vegetation will reduce exposure to these worms.

3. Reduce Your Stocking Density

Goats and their parasites have evolved over a long period of time and under more primitive conditions the level of parasitism in animals would probably be limited by their tendency to roam over greater areas. Now , we often collect up the animals and restrict them to small pastures where the numbers of parasite larvae can build up to dramatic numbers leading to frequent drug treatments leading to resistance.

4. Don't Pinch Pennies On Diet

Many experiments over the years have shown that animals on a high nutritional plane are more resistant to the adverse effects of parasites than those on marginal diets. Protein and minerals, as well as energy, are important in resisting the effects of barber pole worm because new red blood cells must be generated to replace those lost to the parasites. Nutrients are also needed to develop an immune response to the parasites.

5. Appreciate Normal Immune Responses To Parasites

Goats will develop some immunity against worm parasites, If we list categories of goats from least to most immune it would generally be: Kids (require a full grazing season to develop immunity), Kidding and lactating does, Bucks and Dry does.

Concentrate your worm control efforts on the goats that need it the most and remember that immunity will be overcome if goats are exposed to high numbers of worm larvae.

6. Consider resistance to parasites in your selection program.

There is definitely a genetic component in resistance to parasites that is most likely related to the immune response. If you have a goat that always gets anemic before the others, consider culling it. Similarly, keep the ones that never seem to get anemic. There are other ways to select for resistance based on fecal egg counts, they work best with large herds.

7. Maximize Pasture Use To Reduce Parasite Numbers.

Some ways to reduce parasite numbers on your pasture to safe levels include:

- o Let pasture sit ungrazed for a full grazing season (often impractical)
- o Take a cutting of hay from the pasture-this dries out lots of worms.
- o Have an early kidding season so that kids are weaned and sold before pasture larvae levels become really high.
- o When you have safe pasture, always put the most vulnerable animals on it first-in most cases that would be the kids.
- o Graze the pasture with a different animal (horses or cattle, not sheep or young calves, that also get barber pole worm) or use mixed grazing.
- o Most of the worms in the stomach and intestines are pretty specific to their hosts and won't infect other animal species. The exception is a stomach parasite that infects ruminants and horses, but usually does not cause any problems.

8. Restrict Access to Pasture

This is obviously a more radical solution, but worms will not be a problem if goats aren't grazing.

9. Use Drugs Wisely**Drug categories**

All of the available "modern" dewormers fall into 3 major groups of drugs. You need to recognize which ones are in each group because once worms become resistant to one member of the group, they will be resistant to the other members of the group. In the following chart, BZD stands for "benzimidazole".

Drugs that are not FDA approved for use in goats can only be used following consultation with your veterinarian.

Chemical Name and Family	Approved for goats	Trade Name (example, there are others)	Goat dosage (mg/kg) oral administration
Fenbendazole BZD	yes	Safeguard	5 is the approved dosage
Albendazole / BZD	Not approved for use in goats	n/a	n/a
Morantel / Nicotinic	yes	Rumatel	10
Levamisole / Nicotinic	Not approved for use in goats	n/a	n/a
Pyrantel / Nicotinic	Not approved for use in goats	n/a	n/a
Ivermectin / Macrolide	Not approved for use in goats	n/a	n/a
Doramectin / Macrolide	Not approved for use in goats	n/a	n/a
Moxidectin / Macrolide	not approved for use in goats	n/a	n/a

Use The Correct Dose Dose for the heaviest goats or divide them into groups (kids and adults, or example) and dose for the heaviest weight within each group. Underdosing promotes the development of resistance.

Administer The Drugs Effectively In the past few years, researchers in Australia have done many experiments trying to determine how to maximize the efficacy of the drugs we have. Here are some of their findings:

When giving a product orally, make sure you put it in the back of the mouth. If you deposit it in the front of the mouth it is more likely to stimulate the closure of the esophageal groove. This groove is important in kids because it allows the milk to go directly from the esophagus to the stomach and bypass the rumen. Once a goat is weaned this isn't necessary anymore and with dewormers it is much better if they go into the rumen because they will be more slowly absorbed and stay in the body longer.

When giving benzimidazoles by mouth it is better to hold the animals off feed for 12 to 24 hours before treatment (don't remove water, just food). The drugs will not pass so quickly through the GI tract and active levels will be maintained in the body longer. If you are using a benzimidazole drug (known as white drenches in Australia) and are concerned that you might have resistance you should give 2 doses of the drug separated by 12 hours. This will improve efficacy for some period of time but not indefinitely. This protocol would be useful at the point where you start noticing that the drug isn't working so well.

Rotate Dewormers

To reduce the selection for resistance it is best not to use any single drug group for too long. For small ruminants the general recommendation is to change your dewormer groups annually.

Drug Combinations

If you find that you do have worms resistant to more than one drug group, you can maintain the activity of the drugs for a while by giving them in combination. This is obviously more expensive but should provide efficacy against the parasites, at least temporarily.

Don't Bring Resistance To Your Farm

If you get new goats, don't let them bring in worms with drug resistance. Always quarantine new animals and immediately deworm them with at least 2 drug classes. Keep them separated, preferably away from any pasture, for a few days until no further eggs would be passed in the manure from imported drug resistant parasites.

Organic Dewormers ?

Currently, there is great interest in "natural" products as an alternative to pharmaceutical company products in controlling parasites. This category includes herbal dewormers and diatomaceous earth. There are no studies that I know of that suggest that these products have any substantial effect on barber pole worm or other internal parasites. In the case of diatomaceous earth there have been several studies done by parasitologists in different parts of the country that have found no beneficial effect to feeding it or offering it as mineral. Specific brands of herbal dewormers have not been tested so it is difficult to make recommendations about them. There are certainly a number of plants that contain compounds that can be shown to have anthelmintic activity but what level of parasite control these plant-derived products will produce can't be predicted and there is not much information available about them. It is also of concern that there is little information about their safety. These products do not go through the same rigorous testing for safety that drugs do and just because they are plant derived does not mean that they can't be harmful. Herbal dewormers and diatomaceous earth may have a place in parasite control but until there are some controlled tests to support them, it is not possible to recommend their use. **Other Parasite Problems**

Two other parasites that are also difficult to control are coccidian and meningeal worm.

Coccidia

After the intestinal worms, coccidia are probably the internal parasite problem encountered most frequently. There are many species of coccidia that live in the intestinal tract of goats. Here are some important things to remember in the war against coccidia:

1. All goats have coccidia, that's OK. The goal is to prevent disease, not infection.
2. Goat coccidia only infect goats and goats are not infected by coccidia from other animals, not even sheep
3. They are single celled protozoan organisms that multiply in the host.
4. They produce oocysts that come out in the feces and contaminate the environment. Oocysts are infective for another goat after a few days in the environment.
5. Oocysts are very, very tough and can live for a year. The only thing that really kills them is desiccation. They can be on pasture, in the barn-just about anywhere.
6. Most goats get infected in the first few days/weeks of life, but it is uncommon to see any disease in goats less than 1 month of age EXCEPT dairy goat kids that may develop severe fatal coccidiosis in the first few weeks.
7. Coccidia scours is most likely to be a problem in goats undergoing some stressful experience. It might be as simple a stress as a change in diet. A common time to see coccidiosis is at weaning.
8. Young goats are more likely to show signs of disease than adults.
9. Signs of coccidiosis include scours, weight loss, poor hair coat, loss of appetite. In several cases goats can die. If goats have severe coccidiosis they may remain poor doers indefinitely because of scarring in the intestines.
10. Treatment of coccidiosis is partially successful, prevention of disease is better. Consider providing coccidiostats shortly before goats will be stressed (weaning, kidding, etc)
11. Sanitation is best for controlling levels of exposure. Don't feed off the ground and keep feed troughs clean. Provide good drainage for pens and confined areas. Oocysts survive better if they are in moist areas. Remove manure where possible.

Drugs that are not FDA approved for use in goats can only be used following consultation with your veterinarian.

Treatment -these drugs are not approved for use in goats.

1. Trimethoprim sulfa
2. Amprolium

Preventatives - target use to times of stress

1. Decoquinate (0.5 mg/kg bw per head per day in feed or salt) Approved for use in goats
2. Monensin (10-30 grams/ton of feed) Approved for use in goats. Monensin is toxic for horses and turkeys
3. Lasalocid. Not approved for use in goats.
4. Amprolium. Not approved for use in goats.

Meningeal Worm

Meningeal worm or brain worm (scientific name *Parelaphostrongylus tenuis*) is a particularly menacing problem because it crops up with no warning, it is frustrating to treat and difficult to prevent. Here are some key points to remember about meningeal worm.

1. This is a normal parasite of white tailed deer and rarely causes problems in them. It lives in the meninges (lining of the brain).
2. Larvae of the parasite are passed out in the manure and are eaten by snails/slugs. Goats are infected when they eat the snails/slugs.
3. In goats, the worm larvae migrate out of the GI tract, through the abdomen to the spinal cord. They migrate up the spinal cord, causing lesions they go
4. Some infected animals show no signs, some may develop lameness that resolves on its own. Severely affected animals can show rear limb paralysis only or paralysis that starts in the rear and then involves the forelimbs as well.
5. Goats usually remain alert and eat and drink because the parasite usually doesn't get as far as the brain.
6. There is no way to definitively diagnose this infection in a living animal. Diagnosis is usually made on the basis of history and clinical signs and sometimes cerebrospinal fluid analysis.

Drugs that are not FDA approved for use in goats can only be used following consultation with your veterinarian.

Treatment of affected goats includes anthelmintic treatment

1. Ivermectin (Not approved for use in goats) and/or fenbendazole
Whatever your treatment protocol, some animals will get better and some won't and that's about all you can say.
2. Anti-inflammatory drugs are also an important part of the treatment.
3. Supportive care-provide food and water, recumbent animals may need to be supported to stand, treatment of ulcers that may develop

Prevention is clearly better than treatment. Suggestions for prevention include:

1. Exclude deer from your pastures (easier said than done)
2. Try to eliminate snail and slug habitats from pasture. These intermediate hosts aren't aquatic so they will be around even if you don't have standing water. You may want to remove fallen trees, fence off damp areas, etc.)
3. Some like to use predators of snails and slugs-most popular would be guinea fowl and geese
4. Some recommend suppressive monthly deworming programs but this will add to the risk of development of resistance by barber pole worm and its relations in the GI tract that are ultimately the greater problem.

About the author: Acknowledgments - This article was the result of numerous conversations held with Dr. Kevin Anderson from the College of Veterinary Medicine, NCSU, Raleigh, the copilation of articles and short notes written by Dr. Anne Zajac from the Virginia Polytechnic Institute and State university, Blacksburg, Drs. Kevin Anderson, Daniel Amaya, Jeff Musser, Sandy Grant, Dan Moncol and Michael Levy from the College of Veterinary Medicine,

NCSU, Raleigh, and Dr. Thomas Thedford, who wrote the Goat Health Handbook, and finally the copilation of notes taken during field days and 'goat meetings'.



Email: [Contact INFO](#)
Telephone: [Contact INFO](#)

Designed & Hosted by: [JOLLY GERMAN](#)
◆ 1999-2012 [GoatWorld.Com](#)



All written, audio, video and graphic material contained within this site, except where otherwise noted, is Copyrighted ◆ 1999-2012. Some content may also be the property of contributors to the site, in which case their material is also protected by applicable copyright laws and this copyright policy. No material may be linked directly to or reproduced in any form without written permission. If you would like to reprint something from our site, simply send us an email to request permission to do so. Please refer to our [REPRINT criteria](#).

◆ Gary Pfalzbot, Colorado, USA
This site is run and operated by a Disabled Veteran