

# **Now for the Gut Worms!**

*Steve Hull, PhD; TimberLake Farms, Inc.*

Previously, we discussed management and control of meningeal worm (*Paralaphostrongylus tenius*). Control of “M worm” or “P tenius” is based on this parasite’s individual biology, the life cycle in the alpaca, the importance of year round regular (monthly) use of proper wormer and the complete lack of resistance to the wormer. Here we focus on gut parasites, which require a completely different strategy. In summary, regular gut worming is not done, but regular fecal analysis takes the place. Only when the fecal test indicates gut worms will you want to worm. There is one exception (liver flukes) that we will discuss at the end of this article. SNIP

Why worm? Alpacas in the South American altiplano are not wormed. The answer is our management and the completely different life situation/ecology present outside the alpaca’s native habitat. The altiplano is dry with hot summer days, while most nights are below freezing. Alpaca numbers per acre (stocking rate) are generally very low with alpacas ranging far and wide for forage. None of these conditions favor spread of parasitic worms.

By contrast, our management has a high stocking rate with far more alpacas on much less space. Our typically concentrated farms make it virtually certain that if one animal in the pasture has parasites, then those pasture mates will also have them. In general, our environmental conditions have far more rain and more moderate temperatures that both favor parasites. Then we transport alpacas far and wide for shows, breeding or for sales that contribute to parasitic transmission between animals and thus farms.

Frankly, our parasite control measures have not been good. For example, do you change your shoes/boots when you visit another farm and then come home? I didn’t – until I thought about it. I now have a set of boots that I keep in the truck when I go to visit another farm. I remove them before returning to my farm and keep them in that car so the parasites are baked (or frozen in the winter).

Every farm either has parasitic gut worms or will have them. They are biologically impossible to eliminate. Many healthy animals have just a few and their robust physiology keeps the parasites in check and at a minimal level. But stress, and this includes normal stresses such as pregnancy, can allow those few parasites to rapidly multiply. The key is to minimize exposure, know what parasites are in your animals and then properly worm as necessary.

Time of year is also critical. Your specific farm locale will determine your most vulnerable parasite times when you need to check fecals more frequently. For example, temperature extremes make it very hard for worms to survive on pasture. Thus, in the dead of the northern winter, it is unlikely that pasture parasites are highly transmissible. But depending on your clean-up hygiene, crowded winter barn conditions can make it very easy for parasite transmission from animal to animal. The arid and hot southwest

summers also limit parasites, but they can live very happily in wet areas where we have water for cooling the alpacas. At a minimum, you should be checking for parasites three to four times per year

In general, the most susceptible times are when the environment allows the parasitic egg to live outside the alpaca for the time necessary to infect another animal. For many of us, the warm and humid springtime, early summer and fall are the times when we must be most vigilant.

Grazing alpacas are typically infected with a wide range of parasites through what is called “fecal oral” transmission. This means that just one animal with gut worms can infect the entire pasture. Worm eggs in the fecal matter are deposited on the pasture and, under warm moist conditions, the egg hatches into the larval form of the parasite. These larvae crawl up onto the grass. Other animals grazing on that pasture ingest the parasitic larvae. In the gut, the larvae develop into the adult worm that with time then begins to shed eggs in the feces thereby completing the life cycle. These parasites include pinworms, round worms, tapeworms, coccidia and other species. Discussion of each is a subject unto itself and we will discuss management strategy and not each worm’s specific biology.

Parasitic worms in general can be broken down into those that are blood suckers (such as whipworms) or those that get nourishment from diffusion of gut nutrients into their system (tapeworms for example). The importance of this is that for many, the grossest of worms, tapeworms, are much less threatening than other blood sucking parasites that can cause anemia to the point of death. The presence of an adult tapeworm in fecal matter gives the shivers to many owners, but adult blood sucking whipworms are rarely seen in the fecal matter.

Whipworms attach to the inner intestine lining and suck blood to get their nutrition. Some of these bloodsuckers are incredibly dangerous. The worm *haemonchus contortus* (also known as the wire worm, barber pole worm) can reproduce in only three weeks and can literally bleed an animal out – but you don’t see the hemorrhage. These specific parasites are especially dangerous due to their rapid life cycle, blood sucking ability, rapid spread and increasingly resistance to worming medications.

The first issue to consider is the fecal exam. Here, your veterinarian will examine the feces primarily for the presence of worm eggs. For some parasites, the specific parasite is found (coccidia), but the vast majority of parasites are identified by the shape, size, color, etc of their eggs – not the actual parasitic worm.

One exception is the tapeworm. As an owner, you may actually see tapeworm segments that appear like grains of rice in the fecal matter or adhering to tail fleece. Or you may see an actual tapeworm segment. These are visually identical to the common tapeworms that dogs and cats often get.

Having parasites does not mean a death sentence for your alpaca. With a few exceptions, parasites need to co-exist with their host. If they kill their host then they limit their spread. Thus, a successful parasite does not kill, but uses its host to allow transmission of that parasite's eggs over a wide range. But parasites do interfere with nutrition, pregnancy, cria growth and other management that we wish to maximize.

One hint that you may have parasites is a change in the fecal matter consistency. This can be simply soft fecal matter (like bread dough), to a sloppier situation (pudding consistency) to a dangerous very watery diarrhea. The alpaca's hocks may show signs of this. Any change in fecal matter consistency means a change in that animal's gut biology. It could simply be that the alpaca is changing their diet going from winter hay to fresh spring forage. Or a stress, like weaning, is going on. But many normal looking alpacas, even with appropriate "beaned" fecal matter, are loaded with parasites. So fecal appearance is not always a good indication.

As a manager, I like to see every animal checked for parasites, but on large farms, this is simply impossible. Therefore strategic sampling must be done. This involves going out to a specific pasture, for example your adult males, and collecting fresh beans from 20-30 of the animals in that specific pasture. Fresh means that the fecal pellets are still green and not dark brown and dried up. Warm and fresh is good! To pick them up, I use a wooden toothpick and place two-three "beans" from each individual alpacas' dung pile into a plastic baggie. Make sure to label the bag with an indelible marker such as a "Sharpie" pen with the pasture or animal. I often joke in seminars that the easiest way to get fresh poop is to clean the barn (and they come in and poop in it almost immediately!). Repeat this sampling in every segregated pasture with beans in specific marked baggies.

Critically, I also remember to discard the toothpick . . . .

Mash all the beans together in their individual bags to create a common poop sample. If there are parasites in one of my males, then it is almost a certainty that the other males in that pasture either have those parasites or have them in immature form. In any case, worming of that group is called for. Just "mash" the beans together to create a uniform sample.

Store the sample discreetly (and well labeled) in the refrigerator (NOT the freezer). Discretion is appropriate for spouses/children/in-laws that are not seasoned alpaca owners (some day ask me the story of my in laws and the 'fridge poop sample . . . .). Deliver the sample to the vet the next day. For mailing, use an overnight or one day service. This allows minimal degradation of the sample.

Your veterinarian will typically place a small bit of the fecal sample into a dense liquid solution (saturated sugar or zinc sulfate). Since the parasite eggs have a different density than the liquid, most of them will slowly rise to the fluid surface. There, they are collected on a cover slip and then examined microscopically. Centrifugation of the fecal solution slurry is the standard and recognized way to speed up this process. The old way was to use the older and less reliable "fecal float" technique. According to Dr. Norm

Evans, in the latter case it is essential for the eggs to rise in solution for at least 24 hours. This is where the five-minute centrifugation speeds up the process.

Do not use the standard ten-fifteen minute fecal float, as it is simply not reliable. This technique may not allow enough time for the parasite eggs to surface. The result is that a lot (the majority?) of short fecal float tests indicate a negative result (no eggs seen), but when examined correctly are actually positive (eggs present). My veterinary business partner, Dr. Tom Cameron found this out the hard way and he now says: “the standard short fecal float isn’t worth sh . . . poop”.

I strongly encourage your veterinarian to examine the fecal matter. During veterinary school, students have a two-semester parasite course, each with a lab, where they study this issue. Am I just sucking up to my veterinarian friends? No. Identification of these parasite eggs is an art, not just a science and trained veterinarians can quickly scan the sample with precision to tell you the specifics of each parasite and how much there is. Veterinarians do scores of fecal exams per week and immediately know what is an air bubble, pollen grain – or an egg from the dangerous *haemonchus contortus*. I do not do my own fecal tests. I regularly send sh . . . err poop to my veterinarian . . .

Many veterinarians use the following scale to grade the fecal exam: none seen, few present, moderate level and heavy infestation. This is often recorded as a 0, +, ++, +++ with TNTC (too numerous to count) as the absolute highest level. Do not necessarily expect to get a result where they report five eggs from this parasite and two from another.

Here is something critical. Not seeing eggs does not mean they are not there! It simply means that the specific sample did not have any observed parasite eggs. We know that some parasites periodically shed eggs. But there are also times when they are not shedding eggs. So with a “negative fecal” (no parasite eggs found) a repeat fecal test in an animal where you are suspicious, may be an excellent strategy.

I especially pay attention to an animal or groups of animals that in the past have none to just a few eggs – but now have a moderate to high level. I do not necessarily worm every alpaca with low parasite numbers. But they are under scrutiny. It is also important to realize that coccidia are normally present in the gut in low numbers. But a sudden increase in one type of parasite means a change. And that animal needs attention. So a simple chart indicating the prior fecal results is an essential part of your farm management.

Now you know what parasites you have and the degree to which they are present. Your veterinarian will suggest a wormer appropriate for the specific parasite, animal situation, pregnancy and weight. There are excellent wormers, for example albendazole (trade name of Valbasin). But this specific drug (albendazole) is well known to cause embryonic malformations. So, it simply cannot be given during early pregnancy. Other drugs, such as fenbendazole (trade names of Safeguard or Panacur), are much safer. Note the potentially dangerous similarity of the respective chemical names (albendazole vs. fenbendazole).

There are specific situations where you must target an individual parasite specie with a very specific wormer. For example fenbendazole or albendazole will not kill a particular type of parasite called coccidia. For this parasite, veterinarians may suggest use of oral administered drugs like amprolium (trade name of Corid) or antibiotic drugs such as Albon (trade name sulfadimethoxine) or trimethoprin-sulfadiazine (trade name of Tribissen). This is where your veterinarian can be your key strategic partner in herd health. From course work, they know which wormer to choose for which parasite. They know of drug resistance and what wormer drugs are problems with pregnancy. Yes, you can read about this in books or over the counter at the feed store . . . but do you REALLY know what you are doing?

After you know what you have, then the wormer drug must be given at the correct dose and for the appropriate length of time. For many common gut parasites, fenbendazole is given at 20 mg/kg orally for three to five consecutive days. Using a bit of math means that the 20 paste or liquid solution needs to be given at one ml of the paste per ten lbs of alpaca. A 100 lb alpaca gets 10 ml and a 50 lb cria gets 5 ml. Note one ml = 1 cc for fluids.

Warning, there are 10 and even 1 fenbendazole solutions out there for sale. The 1 ml per 10 lbs of alpaca is only for the 20 paste or liquid solution.

Now we have “wormed the alpaca” . . . or have we?

How do we know that the drug killed the parasite? This is where the repeat fecal, at about two weeks post worming is absolutely crucial. Sadly, some owners are asked if they have parasites and they: “yes, but we just wormed the alpaca”. How do they know the worming killed the parasite?

We need to recheck the fecal, as there are increasing numbers of resistant parasites out there. Simply giving the standard wormer is not enough. You MUST check to see if the wormer has worked.

Years ago, I had engine oil changed in my car. I paid the bill, drove off and less than ten minutes later the engine seized up. Apparently, no oil was replaced at the oil “change”. The engine was ruined and I was without a car for several weeks during repair. Now at each oil change, I always check the dipstick to make sure that oil is replaced. The mechanic always looks at me funny until I mention why I check. Parasite control is like an oil change – always check to see if the procedure was done correctly.

A resistant parasite means that the standard treatment did not work. The danger of this parasite is that it can now go to every other animal and will cause havoc on your farm. Imagine the consequences if your breeding male gives a resistant parasite to the outside female that you are breeding – and charging for. Your veterinarian now will suggest an alternate treatment, dose or wormer to eliminate this very dangerous resistant parasite. But this means that your vet was involved with the fecal checks beforehand . . .

Along with many veterinarians, I like to avoid worming in very early and then late pregnancy. The best time to worm may be between birth and re-breeding. With a very pregnant alpaca, unless the parasites are very bad, I am not going to stress her out. I just make notes, wait a few weeks and then worm her. The parasites are already on the pasture – no changing that.

Young crias can get worms. I have had to worm a two-month-old cria for tapeworms. In this case, I saw big fat and dead tapeworms in the fecal pile two days into the worming schedule. This is not gross, but actually success!

Why not use monthly gut worming like we do with M worm? Many well-intentioned alpaca owners have done this. As a result we are now seeing the development of gut parasite resistance. I recall when ivermectin came out (decades ago) and it was a miracle wormer. We would joke that we could just wave the wormer over the cattle and gut worms would be gone. But it got used too much and too lightly. Now ivermectin is virtually useless against gut worms.

What happened with ivermectin was that small doses killed many of the gut parasites – but not all. The surviving parasites, with some resistance to the wormer, lived AND they are the ones that reproduced passing along the partial resistance to the wormer. Then, a month later, the well-meaning owner again comes and gives another small dose. The fecal test may indicate that there are few to no parasites. All is good, right?

**WRONG!** (note the caps, bold and underline – this is a major issue).

The continued use of “regular” gut worming means that the parasite will (not maybe, but will) become resistant. Month after month, small doses of wormer are given. What predictably results is that gut parasites are now essentially completely resistant to ivermectin and now our other front line wormers. In some locations, the same is now happening with fenbendazole (Safeguard and Panacur).

With regular gut worming, this is not a MAYBE will become resistant, but a WILL become resistant to that wormer. Then you must start with more dangerous and or less effective wormers.

Do not use a regular worming practice. The situation is identical to the drug resistant bacteria that are currently plaguing human hospitals with drug resistant infections. Antibiotics were overused and were not used properly and/or strategically.

What about M worm? Why do we use regular worming with that parasite? Recall that this particular parasite cannot reproduce in the alpaca. Since it cannot reproduce there cannot be the development of drug resistance.

We mentioned liver flukes (*fasciola hepatica*) earlier on. These parasites are well known in cattle in California, the southern tier of states and scattered in other areas. Well

meaning veterinarians will not have us treat for liver flukes due to the prior known distribution in cattle. But alpacas are not cattle.

I have heard from veterinarians from New England, Colorado, the upper mid-west and other areas where liver flukes are not supposed to be that indeed they are seeing liver flukes in alpacas at necropsy. The alpaca had vague symptoms, but nothing specific. Nothing was seen in the fecal exam. Then the alpaca died and the necropsy was done.

The problem with liver flukes is that their eggs do not end up in the fecal matter. Camelids do not have a gall bladder and this anatomical issue may prevent the fluke eggs from escaping into the gut and then fecal matter. Meanwhile the liver fluke invades the liver, causing progressive and massive damage.

This is one gut parasite that I suggest blind worming for. Just twice a year as liver flukes grow slowly. I use the word “blind” as I can’t tell if the worm is present or not. Veterinarians suggest the drug of choice is oral chlorsulon (brand name of Curatrim). This drug is present in the injected medication “Ivomec Plus”, but many veterinarians feel that the concentration of chlorsulon in that formulation is too low to be effective in alpacas for flukes. Check with your veterinarian on your worming program and make sure to let them know that liver flukes are increasingly showing up in areas where we “assumed” flukes were not present.

We also should not forget about pasture rotation. Many parasitic eggs have a limited infectious life after being freshly deposited on the pasture. Removing all grazing alpacas from an “infected” pasture can do a lot to reduce the rate of further transmission. The time off depends on your weather, precipitation pattern, type of worm and number of alpacas on that pasture. As previously mentioned, summer heat and winter cold both can minimize parasite spread. Many speak of a four to six week interval to rid the pasture of many parasites.

One simple and excellent management strategy is to fecal check your alpacas before bringing them to a new pasture. If there is a positive fecal, appropriately worm that group. Then do the fecal re-check (to insure no resistant parasites) and then move the now clean animals to the new pasture. This will extend the time of having a clean pasture.

In summary, gut worms are something to be controlled. Management assists with good herd health including healthy pregnancy and cria growth. The number top strategic issues are regular fecal monitoring and good communication with a knowledgeable veterinarian.

Next time we will follow up with a discussion of why pasture forage analysis is critical in the summer for your fall crias. Hint – think of when the vast majority of the fetal weight gain is . . .

Stephen Hull, MS, PhD, Tom Cameron, DVM & families  
“a full service alpaca farm including seminars and consulting”