

# Internal Parasite Control in Camelids

By David W. Corley, D.V.M.

Control of internal parasites in South American Camelids can be very challenging. With resistance to dewormers becoming a worldwide problem in small ruminants and camelids, it is very likely that everyone associated with this industry will have to pitch in to help solve the problems we're sure to face until new dewormers are developed. Hopefully, this article will help some of you in developing better ways to recognize a worm problem and then solving the problem in each of your individual herds.

Before we address the hands on part of recognizing problems and solving them on your farm, I would like to give everyone some background information. This information will help ranchers navigate problem solving at their ranch, because each ranch will need to customize programs for parasite control based on veterinary recommendations, pasture conditions, climate, available labor, handling facilities, etc.

Much of what is being done for the control of internal parasites in camelids has been extrapolated from what has been done with ruminants and small ruminants. The reason this information was used is because of the extensive research already completed with small ruminants and the lack thereof in camelids. Also, many parallels can be drawn between camelids and ruminants with regard to their feeding habits and the similarities of their digestive systems. Both groups are foregut fermenters that regurgitate, re-chew, and re-swallow their food. The biggest difference in their digestive systems is that camelids have a three compartment stomach that is resistant to bloat and

ruminants have a four compartment stomach that is susceptible to bloat.

For the past 25 years most of my practice experience has been with cows and small ruminants. So far this experience has helped me in my work with camelids. The experiences and lessons learned have converted to camelid medicine very well. But, I do caution veterinarians and producers about treating and controlling internal parasites in camelids based on information gathered from the small ruminant industry. Internal parasite treatments and control strategies should be based on good camelid research and/or good practical experience gained by the producer and veterinarian working together to solve problems on their ranch.

Parasitologists now believe that the most important factor responsible for the worldwide development of dewormer resistance is the common practice of treating all animals in the herd at one time. If producers could identify and treat only those animals that truly needed treatment with dewormer, they could slow resistance, save money on labor and dewormer and lower stress on the entire herd from handling. This method can also be used to identify and cull animals requiring repeated treatments. These animals are usually genetically inferior, not easy keepers, easily stressed, and/or need extra attention. Producers will find as they use this system only 20 to 30% of the herd will have most of the worm problems each year; the rest of the herd will do just fine if all other management considerations are taken care of. When this system of deworming is not working, then troubleshooting the overall herd management plan should be done to solve the problem.

Management practices are very important in controlling internal parasites so that deworming the entire herd at one time won't be necessary. Ranchers must remember that stress in the individual animal is what allows worm burdens to grow to intolerable levels. Examples of stressors are weaning, growing, parturition & lactation, severe weather, old age, inadequate nutrition, poor grazing conditions, crowding, sickness, handling and shipping. If any of these stressors are combined or severe enough, along with exposure to larvae, that animal will likely develop a worm burden. A burden will produce clinical symptoms that the producer will hopefully recognize early enough to treat before any damage is done. Worm eggs passed in the feces typically will not hatch into infective larvae unless weather conditions are favorable. Mild temperatures and moist ground conditions are required. Hot/dry ground or freezing temperatures will not allow larvae to survive. Camelids grazing short forage during favorable conditions will ingest more larvae than those grazing tall forage during unfavorable weather. Developing a herd health plan using all of the variables just mentioned can be quite complicated, and developing a deworming strategy should be in that herd health plan. Producers should use every available resource (veterinarian, extension agent, other producers, publications, etc.) to develop herd health plans and deworming strategies.

Now that we have some background and basics about resistance, why animals get wormy, and the importance of having a plan, let us start identifying the individuals that need treatment. Many times a client presents a patient to our hospital that he claims became ill suddenly. From his

level of observation, he is telling me the truth, but in reality this patient has probably become ill slowly, if we are talking about an internal parasite problem. Careful observation of this animal might have picked up illness many days earlier. The changes in these worm burdened animals will be very subtle, and without careful observation will be missed.

Early detection is a key factor in being successful. Once severe symptoms are observed it may be too late to save the patient, even if the proper treatment is being given.

Here are some steps to follow in identifying worm burdened animals:

1. Observe your animals daily and know each one's normal attitude, temperament, and behavior. Look for anyone that is acting out of their norm (i.e., lethargic instead of energetic, friendly instead of aloof, not eating while everyone else is, segregated (not with the herd), etc.

2. Look for clinical symptoms (e.g., weight loss, lethargy, poor appetite, stool that is soft or runny, eyes that matter up with mucous, suspicion that an individual is not growing at a normal rate, etc.).

3. Once you identify an individual with questionable symptoms and/or behavior:

- A. collect a stool sample (make sure it is fresh, not contaminated with soil and at least 2 tablespoons in quantity. Place in a plastic ziplock baggie).

- B. Get a rectal temperature.

- C. Check the mucous membrane color of the lower eyelid. (This will be explained later in this article.)

4. With these pieces of information you can begin to figure out what is going on with this animal, or with the help of your veterinarian possibly make a plan or diagnosis.

5. Tools that you will need to gather this information:

- A. Rectal thermometer made for large animals. (It will have a ring on the end.)

- B. Small container for collecting stool (ziplock baggie, baby food jar, etc.).

- C. Microscope and related materials for setting up a stool sample for egg count. For those of you that want to do your own egg counts with a microscope instead of using a veterinarian, please be sure that you can obtain the materials and necessary training before purchasing a microscope.

- D. A FAMACHA card or training on the use of the card.

The FAMACHA card is a tool developed by the South African Veterinary Association for the classification of animals into categories based upon their levels of anemia. By rolling the down the lower eyelid and looking at the color of the mucous membranes and then comparing that color to the color on the FAMACHA card, the level of anemia can be determined. I highly recommend training in the use of this card for determining the level of anemia in individual animals. These cards can be obtained only by veterinarians by going online to [famac4a@vet.uga.edu](mailto:famac4a@vet.uga.edu). Once a producer has gotten the feel of looking at eyelid color, the card will not be necessary.

Now that we have gathered this clinical data (with experience) we will have some idea if this is a parasite problem, or a case that needs help from the veterinarian. For the purpose of this article, we will assume we've found an animal with clinical data that supports a diagnosis of internal parasites. A very subtle case would typically have a normal body temperature, normal looking stool, and possibly even a normal mucous

membrane color. In this case abnormal behavior and the microscopic egg count may be the only clues that help determine if we have a real problem. An egg count that is high would indicate that internal parasites may be the reason this animal was observed as possibly sick. A negative or low egg count would mean there is possibly nothing wrong with this animal and further observation is necessary. An advanced case might have a rectal temperature below normal, soft to runny stool, and a mucous membrane color that indicates anemia. After confirming the diagnosis with a high fecal egg count, treatment for internal parasites begins.

There are approximately a dozen different products on the market currently being used to deworm camelids. For this article I'm only going to talk about the products I have experience with. (See list of dewormers.) Which products you use will be determined by many different factors, such as time of year, facilities, labor available, pregnancy status, resistance problems in your herd, etc. Talk to other producers, extension agents and your veterinarian. Read as much about deworming in your area as you can. Do fecal egg counts four to five days after using a product to see if it has eliminated the egg count in that individual. That may tell you if that product at the dose you used is effective.

There are essentially three classes of dewormers that make up all the dewormers being used today. When resistance develops to a dewormer in a particular class, then all of the dewormers in that class become suspect to resistance problems. If you encounter resistance to a dewormer, you might have to switch to a dewormer in a totally different class to effectively deworm your herd.

In my practice Albendazole (Valbazen) has been a good choice for

## CLASSES

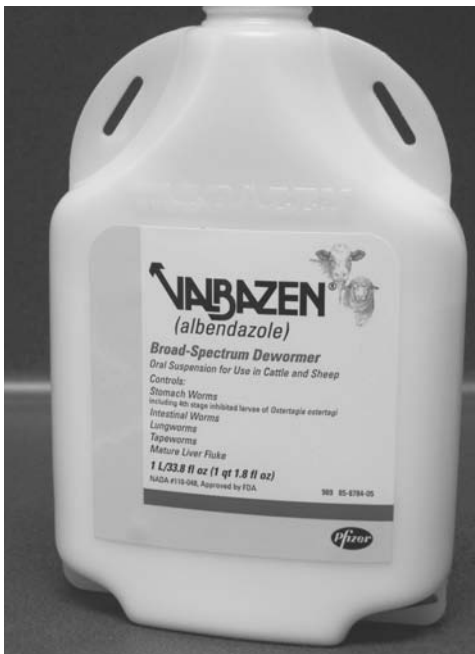
1. Avermectins: Ivermectin, Doramectin, Moxidectin
2. Benzimidazoles: Albendazole, Fenbendazole, Oxfendazole, etc.
3. Imidothiazole: Levamisole

## Dewormers

Generic Name	Trade Name	Dose/Route*	Active Against
Albendazole (not safe for use in pregnant animals)	Valbazen	20mg/1lb body weight oral	tapeworms L4 stage stomachworms haemonchus flukes
Moxidectin	Cyductin/Quest gel	.5mg/1lb body weight oral or injected	L4 stage stomachworms haemonchus
Levamisole	Tramisole Levasole	4mg/1lb body weight oral	stomachworms haemonchus

\* Note: Check with your veterinarian if you have questions or need clarification for dosage amounts.

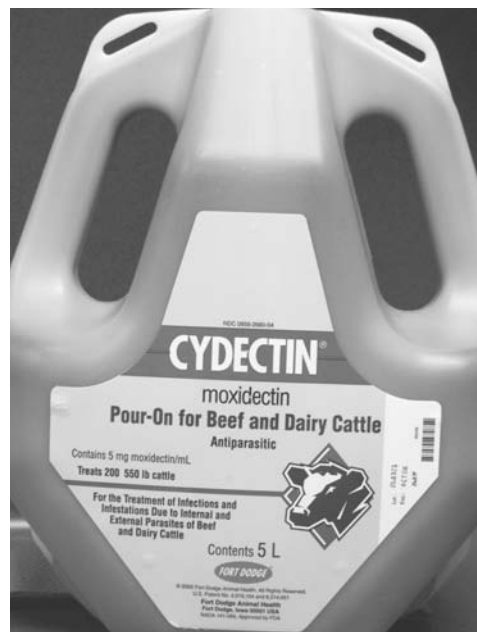
eliminating tapeworms, and it still kills almost 90% of the stomach worms in most herds we've used it on. The drawbacks to using this product are cost and the large volume the animal must swallow. It cannot be used in pregnant animals at the dose I recommend. It does have its place in a deworming plan, because it can be used in your rotation of dewormers to stop tapeworm problems.



Moxidectin (Cyductin, Quest Gel for horses) has been a good dewormer for stomach worms. The cost is low, it still kills 90% or better; it is adminis-

tered easily (as an injection, oral paste, or drenching the pour-on orally), and it is safe at high doses in pregnant females.

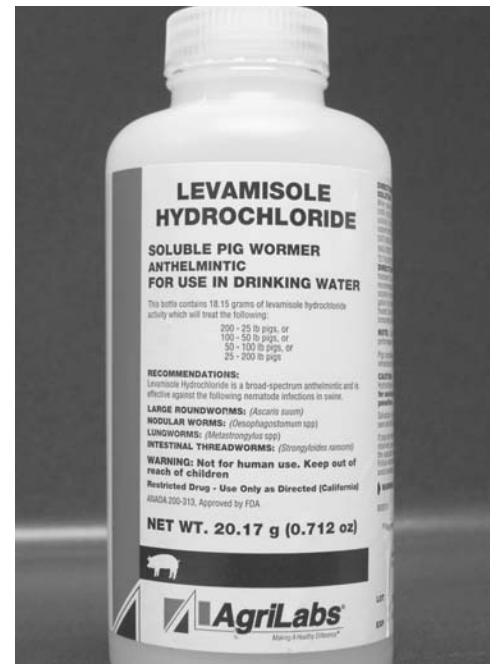
We have found some herds in our practice that have resistance problems to the dewormers I've just mentioned. In those herds we are using an old product called Levamisole. It is working very well! This product is available in a powder that can be dissolved in water and made into a drench or as boluses that can be given with a balling gun. The injectable form is



also low in cost and safe to use in pregnant females.



In cases where there is a poor appetite, diarrhea, and anemia other treatments will be needed. Vitamin injections, oral appetite stimulants, tonics, and anti-diarrheals may be needed. Your veterinarian is a good source for what works and what does not.



At this point I have not said a lot about coccidiosis, but it is also an extremely important disease of young nursing babies, weanlings, and yearlings. Only occasionally does it become a problem in adult animals. This article will not get into coccidiosis, because that will take another whole article to cover.

There are still a few points we must cover to finish this plan. There will be many cases where the entire herd must be dewormed at one time. The reasons for this are too numerous to mention, so let's just recommend what to do when this is necessary.

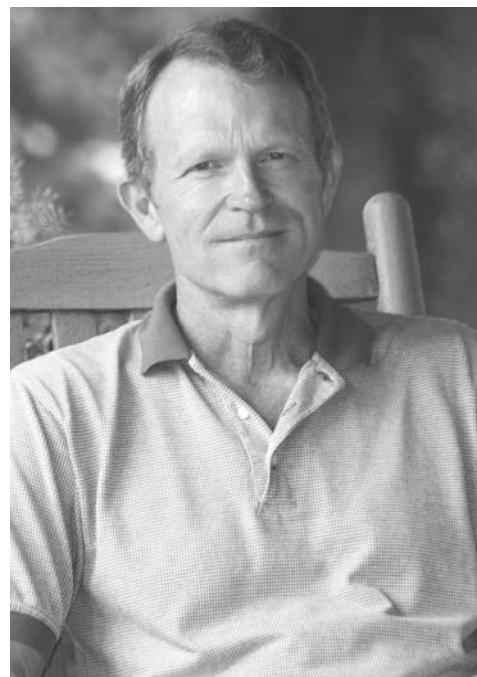
If at all possible, fast all animals prior to deworming. Research indicates that withholding food for about 12 hours prior to deworming increases the efficacy of the oral dewormers. Next, whenever

calculating the dose of dewormer to use in a herd, always base that dose on the heaviest animals. Underdosing can hasten the development of parasite resistance in your herd. There is still some debate about rotating dewormers each year. The latest advice recommends not rotating yearly. Better talk to your veterinarian about rotating.

Practice strategic deworming. This is done when most of the worms are inside the animal and not on the pasture. Each area of the country will

2. Just prior to spring green-up.
3. Mid-summer just prior to hot/dry weather.

After deworming, wait four to five days for all the eggs to clear out of the animals' systems and then rotate the animals to a safe pasture. Examples of safe pastures include pastures where no sheep, goats, or camelids have grazed for the previous three - six months, pastures used for hay production, new pastures where no animals have ever been, or pastures grazed only by horses or cattle.



*About the author:*

*David W. Corley, D.V.M.*

*A 1982 graduate of Texas A&M University, Dr. Corley has practiced veterinary medicine in East Texas for 25 years. He has devoted those years to mixed animal practice in Henderson, Texas. Dr. Corley is a member of the American Veterinary Medical Association, the Texas Veterinary Medical Association, the East Texas Veterinary Medical Association, and the American Society for Theriogenologists. In 1995 Dr. Corley founded Rusk County Animal Outreach, a non-profit organization designed for the purpose of preventing cruelty to animals in his local area. In association with the local animal shelter he also has established a spay/neuter program for all pets that are adopted from that shelter. He has been an active supporter of youth activities in his community by sponsoring a Boy Scout Explorer Post at his hospital for 12 years. In his spare time he is a grandpa, cattle rancher and avid outdoorsman.*



have a different month to do this based on the climate in that area. Generally, these times are:

1. After the first hard-killing frost. The worms are in a hypobiotic stage at this time, and a product labeled for L4 larvae must be used. Fenbendazole and Levamisole are the only dewormers mentioned so far that do not work on this stage larvae.

In summary, I would encourage producers to employ a veterinarian that seems willing to help you solve parasite problems and work with you in developing a herd health plan. He also can keep you abreast of the latest advances in medicine and dewormers for your camelids. Try to be flexible in navigating through problem solving your parasite control plan.