

FALL 2021 - Small Ruminant Edition

BIOWORMA

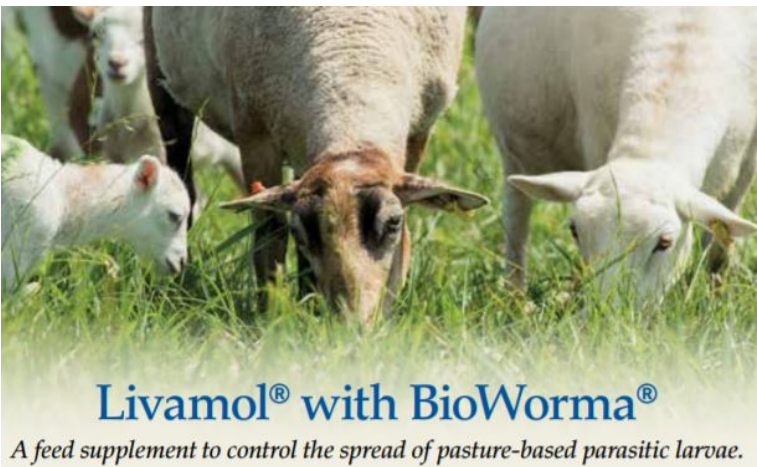
Resistance to dewormers is becoming more problematic in small ruminants. New methods of parasite control are being investigated and one that shows promise is Bioworma.

Bioworma is a feed additive fed to sheep, goats, cattle, etc. that helps to control the spread of parasitic larvae in the environment.

BioWorma® contains the naturally occurring fungus *Duddingtonia flagrans* that captures and consumes worm larvae. When fed to grazing animals the spores pass through the digestive system remaining inert (having no effect within the host animal) and out into the manure. When the infective nematode/roundworm larvae become active within the manure, the fungus sporulates forming a fungal web that captures, paralyzes and consumes infective larvae which breaks the worm cycle. *Duddingtonia flagrans* reduces the number of gastrointestinal nematodes larvae on pasture, which is significantly greater than a chemical wormer. Once the fungus consumes the parasite larvae it will die. Bioworma starts working on the first day fed and in our area should be fed continuously from spring until fall. Overall the average parasite reduction is 68% in sheep and 86% in goats. It does not, however, eliminate the parasites that are already in the animal. Therefore, in addition to using the Bioworma, animals also will need to be treated with a dewormer to remove the internal parasites already present.

Bioworma is safe to use in pregnant animals. It has no negative effects on non-target soil nematodes, earthworms, microarthropods, soil bacteria and fungi. Beneficial insects such as dung beetles are not negatively affected.

For more information and specific parasite control recommendations, please consult your veterinarian as protocols vary from farm to farm.



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THE FAMACHA SYSTEM

The FAMACHA system was developed as a component of a good management program for the treatment and control of *Haemonchus*. FAMACHA measures levels of anemia or blood loss, and treatment decisions are based on these levels. The system is available only through veterinarians who train producers to receive certification to use it.

The barber pole worm (*Haemonchus contortus*) is usually the biggest disease problem of sheep and goats. Major production losses and deaths occur where this parasite is not controlled. Due to overuse of de-wormers over the years, resistance to all groups of de-wormers is an increasing problem. While most sheep and goats are able to withstand some of the effects of *Haemonchus*, a small minority cannot. In the past, treatment strategies were designed for the animals that did not have the ability to withstand infection. Using FAMACHA to selectively deworm only animals requiring treatment greatly decreases the development of resistance, because the eggs produced by the animals that did not receive treatment. In contrast, where all animals are treated and moved to a clean pasture, only resistant worms that survive treatment will produce eggs that form the next generation.



Both resistance (ability to prevent infection) and resilience (ability to withstand the effects of parasites) have been shown to moderately heritable. This means that sheep and goats can be either culled or selected for these traits. Once sheep and goats that are unable to cope with existing worm infections are identified, they can be targeted for special attention without the whole herd or flock having to be treated. In the long term, by culling animals that are repeatedly identified as unable to cope with moderate worm burdens, a more resistant and resilient flock, genetically suited to the environment can be bred.

FAMACHA involves inspection of the mucous membranes of the eyes for paleness indicating anemia. A score card with color pictures is used to assess mucous membrane color in order to score individual animals to identify which ones need treatment. This results in few animals being treated, which reduces the development of resistance in parasite populations. The herd or flock should be examined regularly so affected animals can be treated before the anemia becomes too severe.

The FAMACHA system may only be used after it is fully explained and demonstrated. Ag Vets has a limited supply of kits available for purchase. Kits contain instructions as well as a score card used to monitor anemia in your herd or flock every 2-3 weeks. Cards need to be replaced yearly as they fade with use. Please call to set up an appointment with us if you are interested in using this technique for parasite control on your farm.

Keep in mind that only *Haemonchus* infection can be monitored by this technique. Other parasites can be important, and if these are the primary problem on your farm, FAMACHA may fail to provide a sound basis for treatment decisions.

Fecal samples can be submitted to see if this program is an option for your farm.

COMBINATION DEWORMER TREATMENT FOR SMALL RUMINANTS

Parasite resistance to dewormers is unfortunately widespread and getting worse. Most farms have resistance to two or more of the three major groups of dewormers on the market. Some farms even have resistance to all dewormers and parasite control has become difficult on those facilities. Combination treatment is now the best treatment method for using dewormers and is recommended on farms with parasite resistance problems. In most cases it is not recommended to rotate dewormers, but to selectively deworm small ruminants using specific dewormers for certain situations. There are two major benefits to using dewormers in combination: the additive effect with each drug used so efficacy increases, and the achievement of higher efficacy means fewer resistant worms that survive the treatment creating more dilution of resistant worms.

There are three classes of dewormers (anthelmintics) which destroy or expel gastrointestinal worms. The first chemical class developed was the benzimidazoles which we know as the white dewormers. This includes albendazole (Valbazen), fenbendazole (Safeguard), and oxfendazole (Synanthic).

The second class of dewormers are the cell depolarizers which include levamisole (Prohibit), morantel (Rumatel), and pyrantel (Strongid).

Macrocylic lactones or macrolides are the third class of anthelmintics which includes avermectins and milbemycins. The avermectins such as ivermectin (Ivomec), eprinomectin (Eprinex) and doramectin (Dectomax) are seeing more resistance. The benefit of a dewormer such as ivermectin is that it is useful for treating meningeal worm and external parasites as well. Moxidectin (Cydectin) is a milbemycin and is also seeing resistance issues due to its chemical similarity to ivermectin's.

There is a fourth class of dewormers but it is not available in the US. The product is monepantel (Zolvix) and it is the first new class of sheep anthelmintic since the 1980s. There has been resistance reported already for this dewormer.

Ideally it is best to determine drug efficacy on your farm as it varies depending on the farm environment, genetics of the animals, previous parasite problems, and prior treatment methods. The two ways to determine efficacy are by fecal egg counts and DrenchRite test. Before and after treatment fecal egg counts can be compared to determine the efficacy of any anthelmintic treatment used. An effective treatment will reduce fecal egg counts by 95% or more. The fecal egg count method needs to be done for each dewormer and for multiple animals for reliable results. It will not work well if you only have a couple of animals. The same animals will need to be used for egg counts for it to work. The DrenchRite or larval development assay is an in vitro lab test that uses third stage larvae to test for susceptibility to the different dewormers. It also identifies the type of parasites present in the manure sample. This is a great test which gives much information, but unfortunately it can only be performed at the University of Georgia and is very expensive.

A couple of important take home points to remember when using anthelmintics in combination:

- Safety precautions for a single dewormer still apply when used in combination, but there is no additional risk with using more than one dewormer at the same time.

- Dewormers should be administered at the full recommended dose (or higher for goats) even if administered in combination.

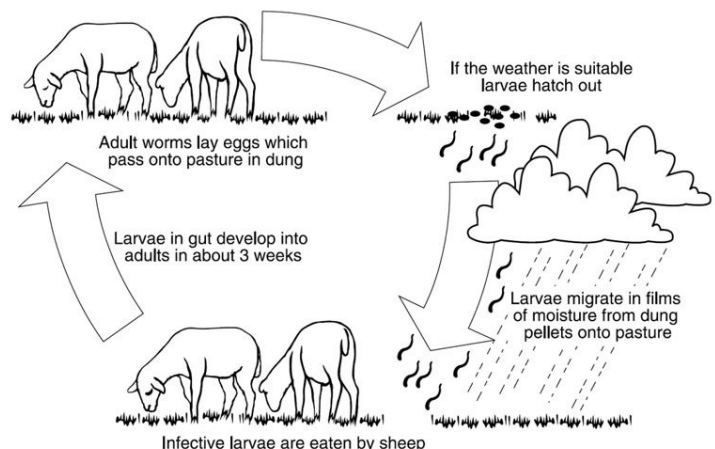
- Meat and milk withdrawals should be followed based on the longest withdrawal time for the dewormers being used in combination.

- Dewormers will need to be bought and used separately for treatment as combination dewormer product formulations are not yet available in the US for purchase. The dewormers should not be mixed together in the same syringe or tube as they may not be chemically compatible to use in this way. Treat with both dewormers in each animal separately but they can be given at the same time.

- Use a combination of two products from two different classes to be effective.

- Some dewormers work best if the animal has been fasted for 12 hours prior to treatment.

Please contact your veterinarian for more information and advice on what may work best for your herd or flock.



MENINGEAL WORM

Meningeal worm continues to be a problem in our area and is more prevalent during years when we receive a lot of rainfall. *Parelaphostrongylus tenuis* (*P. tenuis*), also called the deer worm or meningeal worm, is a parasitic worm very common in white-tailed deer. It does not cause disease in deer but can cause many problems in small ruminants. The worm has an indirect life cycle, requiring land snails or slugs as intermediate hosts before being able to infect a ruminant. Although meningeal worm is best suited to white-tailed deer, many other animals such as sheep, goats, and alpacas that share grazing land can be infected. Sheep, goats, alpacas, and llamas that eat forage with the snail, slug, or their mucus trail can pick up the larvae. After ingestion the larvae migrate out of the stomach into the abdomen and follow erratic paths until they reach the spinal cord and nearby nerves. This causes inflammation and damage to the central nervous system leading to serious neurologic disease. Many affected animals will have trouble moving around; early signs of *P. tenuis* infection include mild stumbling, knuckling and/or dragging the toes of one or both hind limbs, and general weakness of the hind limbs. In more advanced cases the small ruminant may suffer total paralysis of the hind limbs, leaving it sitting or lying down. The front legs are not as commonly affected but can have the same symptoms. Infected animals may show signs of brain disease such as a head tilt, walking in circles, difficulty eating, and eye twitching. Appetite and body temperature often are normal.

Diagnosis of meningeal worm is mostly from grazing history and clinical signs. The fluid that surrounds the brain and spine will also often have characteristic changes to it when viewed microscopically, but this fluid is often difficult to obtain. An absolute diagnosis is made by examining the spinal cord of an affected animal after a necropsy has been performed.

Treatment can include ivermectin to treat migrating larvae, but this is thought to only be effective when the larvae are traveling in the stomach or abdominal cavity and not once they have reached the spinal cord. Ivermectin may not have any effect on larvae already in the central nervous system (CNS). Fenbendazole (Safe-guard or Panacur) for 5 consecutive days is often used because it can penetrate into the CNS, killing larvae already in the spinal cord. Steroids such as dexamethasone and anti-inflammatories such as flunixin meglumine are also commonly used in treatment to help reduce swelling. Some animals recover without any treatment, and not all treated animals recover. Some may recover but are prone to relapses, while others have permanent neurologic deficits.

If you have a small ruminant with possible meningeal worm symptoms, please make sure to call your veterinarian.

Early diagnosis and treatment is often key to the outcome of this infection.

Standard Service Hours:

7 AM - 5 PM, M-F

7 AM - 12 PM, SAT

**Call charges dependent upon time call is received*

Extended Service/Emergency:

24 hours/7 days a week

Typical Business Office Hours: M-F 7 AM to 5 PM

