

Alternative Parasite Control

by Susan Schoenian, Sheep & Goat Specialist - University of Maryland Ext.

While dewormers are usually an essential part of internal parasite control in sheep/goats, they aren't the only option, and their use should be limited to treatment of clinically-parasitized animals. The goal of all sheep and goat producers should be to develop alternative strategies for controlling parasites so that dewormer use is minimized and dewormers remain effective. Alternative strategies are usually aimed at reducing exposure to infective worm larvae and/or enhancing host immunity.

Immunity

Lambs/kids are born worm-free. They get infected with worms when they ingest infective third stage larvae (L3) from their environment. They develop immunity (resistance) to parasites with continuous exposure to low levels of infective larvae. If the level of exposure is too high, their immune systems get overwhelmed and they develop clinical symptoms, sometimes even die. Called

the "periparturient egg rise," females suffer a temporary loss of immunity around the time of parturition.

The ability of a sheep/goat to develop immunity to parasites varies. As close grazers, it is inevitable that sheep/lambs continuously ingest worm larvae from their environment. Their evolutionary response is to rely on their immunity to reduce the impact of the worms. However, it takes time (and continuous exposure) to develop immunity. Goats tend to be more susceptible to worms (than sheep) because as browsers, their natural strategy is to avoid ingestion of infective worm larvae by grazing higher up in the canopy. It is when they are "forced" to graze that they usually develop parasite problems. Their immunity kicks in, but their response is poorer than sheep.

Genetics

Immunity (resistance) varies by breed and individual. One way to reduce the risk of internal parasitism is to raise a more resistant breed or cross. Breeds of Caribbean origin (St. Croix and Barbados Blackbelly) are the sheep

breeds most resistant to parasitic infection. The Katahdin is a composite breed, whose parasite resistance lies somewhere between hair sheep and wool-type sheep. While the only wool-type (medium) sheep with documented resistance to internal parasites is the Gulf Coast Native (and similar strains), there is some evidence that Texel-sired lambs may have less problems with parasites than lambs sired by other terminal sire breeds, such as the Suffolk. On the goat side, Tennessee State University researchers determined Myotonic, Kiko, and Spanish goats to be more resistant than Boers.

If raising or crossing with a more resistant breed is not an option, individual differences in parasite resistance can be exploited. It is often said that there is as much difference within breeds as between breeds. Fecal egg counts are not evenly dispersed in a flock/herd. Twenty to 30 percent of the flock/herd is usually responsible for depositing 70 to 80 percent of the worm eggs. If the low or high egg shedders can be identified, they can be favored for breeding or removed from the

Why Katahdins?

- Natural parasite resistance
- Medium frame and mild tasting
- Strong maternal traits
- Adaptable to any climate
- No wool, no shearing

katahdins.org

A Breed Whose Time Has Come



Katahdin Hair Sheep International

Annual EXPO and SALE

Online Membership and Breeder Directories

Online Registration

PO Box 739

Fowlerville, MI 48836

717-335-8280

info@katahdins.org

flock/herd. Parasite resistance (fecal egg count) is a moderately heritable trait. Some breeds of sheep (e.g. Katahdin) have EBVs (estimated breeding values) for parasite resistance.

It goes without saying that animals that require frequent deworming should be culled. Culling standards should be more stringent for stud males, as they contribute the majority of genetics to the flock/herd. Higher producing females are more likely to need deworming and should not be penalized for their superior performance. The same would be true of lambs/kids from larger litters and first-time moms. Parasite resilience, the ability to maintain health and productivity despite a worm burden, is also a heritable trait. However, resilient animals may still shed a lot of eggs onto the pasture, so greater genetic progress will be made if animals with low (or high) fecal egg counts can be identified.

Pasture and grazing management

Since sheep/goats become infected with internal parasites when they graze, effective parasite control obviously starts with good pasture and grazing management. It is generally accepted that a well-designed rotational grazing program will significantly reduce parasite burdens in grazing animals. Because it takes as few as 3 to 4 days for worm eggs (deposited in feces) to develop into infective third stage larvae (L3), it is often recommended that sheep/goats not be allowed to graze a paddock for more than 4 days. Longer grazing periods can be justified, if weather conditions are less conducive to larval development.

Short-term grazing coupled with sufficiently long rest periods (2 to 3 months) should ensure that most infective worm larvae will have died off by the time the animals return to the same paddock. The downside to long rest periods is that pasture plants may become overly mature. In this situation, another species could be allowed to graze or a hay crop could be removed. Haying also allows sunlight and heat to penetrate the soil, causing larvae to dry out and die. One of the challenges to short-duration grazing is the need for many paddocks (15 under the described scenario), each with the need for water and shelter.

Annual forages can help to reduce parasite burdens by providing nutritious forage and clean grazing. Any time the soil is disturbed (with tillage or herbicide application), worm larvae will be killed off. Warm season annuals (e.g. dwarf pearl millet) can provide nutritious, palatable forage when cool season plants are less active. A winter annual (e.g. cereal rye)



can provide larvae-free pasture for spring grazing. Brassicas (e.g. turnips) are another good annual crop that can fill forage gaps and provide clean grazing.

Browsing is an important strategy for controlling internal parasites in goats. If goats are allowed to browse, they are less likely to ingest infective larvae. Ideally, all goat farms have woodlot vegetation that they can incorporate into their rotational grazing programs. Browsing will give other pastures a rest, while allowing goats to forage cleanly.

Grazing height itself is an important aspect of parasite control. Though it varies by environmental conditions, larvae are only capable of migrating a short distance up the plant. In fact, most studies show that worm larvae stay near the base of the sward. For this reason, sheep/goats should not be allowed to graze pastures that are too short, generally less than 3 to 4 inches (ideally, 4 to 6 inches; taller for some plant species). If pastures are shorter than this, animals should be moved to a sacrifice lot or zero grazing area.

Mixed or multi-species grazing is another grazing strategy that has the potential to reduce worm burdens in sheep/goats. Because adult cattle and horses are not affected by the same parasites as sheep/goats they can be grazed alongside sheep/goats or in rotation, with cattle/horses grazing second. When other animals ingest the larvae of sheep/goat parasites, they kill the parasites, essentially vacuuming the pastures of infective larvae. There is added benefit in that cattle and sheep/goats usually have complementary grazing behavior. If the animals stay together in the field, there can be some added protection from predators.

It is important to avoid “hot spots” on pasture. Ideally, low-lying areas of pasture should be fenced off. The concentration of feces is likely to be higher around water troughs, mineral feeders, and shelter/shade.

Leaky waterers should be repaired. If possible, feeders, shelters, and shade structures should be moved around to prevent animals from always congregating in the same area(s). Grazing systems that utilize central laneways or watering areas need to be aware of the risks that these common areas pose with regards to parasites, including coccidia.

Bioactive forages

Bioactive forages are another option for parasite control. These are forages with secondary compounds that have anti-parasitic effects. In particular, forages containing condensed tannins have been shown to reduce barber pole worm infections in sheep/goats. *Sericea lespedeza* (*Lespedeza cuneata*; AU Grazer) has been studied extensively by members of the American Consortium for Small Ruminant Parasite Control (ACSRPC). *Sericea lespedeza* is a perennial, warm-season legume that grows under some-optimal fertility. It is sometimes called “poor man’s alfalfa.” It is classified as a noxious weed in some states.

Animals consuming *sericea lespedeza* have been shown to have reduced fecal egg counts and (coccidia) oocysts counts. The anti-parasitic effects of *sericea* have been demonstrated in fresh pasture, hay, silage, and leaf meal pellets. To have an effect on worms, it is recommended that diets include at least 25 percent *sericea*. *Sericea* is best grazed in rotation, as long term consumption may have negative effects on growth. To help control coccidia, *Sericea* needs to be fed several weeks before the anticipated period of risk, similar to other coccidiostats. Plants with similar effects as *sericea lespedeza* include birdsfoot trefoil, chicory, and sainfoin.

Biological control

Biological control of parasites is now possible with BioWorma®, a new product that contains a fungus (*Duddingtonia flagrans*) that traps and kills roundworm larvae. BioWorma® is a feed-through product that has no effect in the animal, but prevents reinfection of pastures by destroying worm larvae in the feces. In research trials, BioWorma® has reduced pasture infectivity (larvae) by 86 and 68 percent, respectively, on goat and sheep farms.

Since BioWorma® is regulated by the EPA, its distribution is limited to veterinarians, feed mills, and premixers. A second product called, Livamol® with BioWorma® is available for purchase by producers. Livamol® is a nutritional supplement. BioWorma® must be fed daily to livestock as

Parasite Problems?

University Researchers have discovered a natural remedy for the most common intestinal parasites in sheep and goats

AU Grazer® Sericea Lespedeza

A perennial legume proven to reduce and control barber pole worms (*Haemonchus Contortus*) and coccidia in small ruminants while providing cost-effective forage protein.

Sims Brothers, Inc.
is the exclusive source for certified AU Grazer® seed
For more information visit:
www.simsbrothers.com

Contact us at:
Sims Brothers, Inc.
3924 County Road 87
Union Springs, AL 36089
Phone: 334-738-2619
Email:
service@simsbrothers.com

All seed sold in 50 lb. Bags
Visa, Mastercard, American Express
and Discover Accepted.



a top-dress or mixed in the feed, however it cannot get wet or be incorporated into a pellet. BioWorma® should be fed during periods of peak worm transmission (<40°F) and to animals at greatest risk for parasite infection: periparturient females and lambs/kids. The American Consortium for Small Ruminant Parasite Control recommends that it be fed for at least 60 days. The cost-effectiveness of BioWorma® will vary by farm.

Zero grazing

On farms with limited acreage, confinement or zero grazing should not be overlooked as a parasite control strategy. Even on large acreage farms, confinement is a good strategy for the animals that are most susceptible to parasitic infection. In fact, in the sheep industry, it is common to wean lambs early and put them in a dry lot for finishing.

Because worm larvae does not survive well in hay or silage, sheep/goats raised in confinement or a dry lot generally do not get infected with worms. However, it is important that all sources of vegetation be removed, as it only takes a small amount of vegetation to support larvae survival. Also, coccidia is more likely to be a problem since animals are more densely stocked and the oocysts can survive easily in the bedding and be picked up from

various surfaces. Management

The season of lambing/kidding can have a marked effect on parasite risk. Parasite problems are usually maximized with spring lambing/kidding and summer grazing, while less problems are usually encountered when lambing/kidding occurs in the winter or fall months. Lambing/kidding indoors also reduces the risk of worm transmission. Weaning impacts worm burdens. If lambs/kids will be put to pasture for growing/finishing, later weaning (e.g. 120 days) is preferable to early weaning (e.g. 60 days). Early weaned lambs/kids should probably be marketed early or put into a dry lot for finishing.

Nutrition

There is a nutritional cost to internal parasitism, especially protein. When nutrients are allocated to immune system response, there is less available for pregnancy, growth, and lactation. Parasites reduce feed intake and can affect nutrient absorption. Low body condition scores (≤ 2) are indicative of a nutrition problem and these animals are more prone to parasitic infection. Animals with low body condition and on a poor plane of nutrition are less able to cope with the effects of a parasite burden.

It is well-known that supplemental protein can help to negate the effects of internal parasitism, as well as boost the immune system to prevent infection. Feedstuffs higher in rumen by-pass protein have been shown to be especially beneficial. Energy supplementation tends to improve body condition and resilience to parasites. Supplementation should always be aimed at the animals that are most susceptible to parasitic infection. While less is known about the role of minerals and vitamins, it is important that animals consume adequate amounts of these essential nutrients.

Copper oxide wire particles

While there are many claims of “natural dewormers,” only copper oxide wire particles (COWP) have been proven to have consistent efficacy against worms and only adult barber pole worms (*Haemonchus contortus*). Copper oxide wire particles are tiny metal rods of copper, put in a capsule. They are available as copper supplements for cattle and goats. These larger capsules can be repackaged into smaller doses for deworming sheep/goats. It is recommended that the smallest effective dose be given. Dose is based on age, not weight: 0.5 to 1 gram for lamb/kids and 1 to 2 grams for mature animals. Only animals showing clinical signs of barber pole worm infection should be dewormed with COWP.

Before incorporating COWP into a control program, it is recommended that farms (especially sheep) determine their copper status by submitting livers (or kidneys) to a diagnostic lab for a mineral profile. Fortunately, COWP poses a low risk of copper toxicity, since the copper is slow release and poorly absorbed, in contrast with copper sulfate, a historical dewormer that poses greater risk of copper toxicity.

More on Parasite Management

For more information about internal parasite control in small ruminants, visit the web site of the American Consortium for Small Ruminant Parasite Control (ACSRPC) at www.wormx.info.

Susan Schoenian. Susan is a Sheep and Goat Specialist at the University of Maryland's Western Maryland Research & Education Center. She maintains several web sites, including the Maryland Small Ruminant Page, Sheep 101/201, and the web site of the American Consortium for Small Ruminant Parasite Control.