PARASITE CONTROL UPDATE

Ricardo Videla, DVM, MS, DACVIM
The University of Tennessee
Knoxville, TN, United States

Gastrointestinal parasite control in small ruminants and camelids is a very controversial topic. The current recommendations differ significantly from what we used to recommend a few years ago. Previous recommendations such as deworm on a schedule, deworm the whole herd, and rotate dewormers are opposite from what we recommend today since many of those practices could have contributed to an increase in the prevalence of resistance to dewormers. The current recommendations rely on a holistic approach and not so heavily in the use of dewormers in an attempt to decrease or delay the emergence of anthelmintic resistance[1]. The small ruminant parasite consortium (www.wormx.info) offers a lot of updated information on this subject.

Fecal Exam

It is recommended to do a fecal exam when faced with clinical disease or production losses that could be associated with gastrointestinal parasites. When dealing with large herds or flocks one could perform FAMACHA and body condition scores to determine which animals to sample. A fecal egg count may be sufficient if anemia (possibly associated with Haemonchus) is the main problem. Fecal egg counts are targeted to trichostrongyle type eggs (Haemonchus, Ostertagia/Teladorsagia, and Trichostrongylus). A fecal egg count and a fecal float should be performed when other clinical signs (diarrhea, weight loss, etc.) are detected since those could be associated with GI parasites that may not be reported in a fecal egg count. Both tests share some limitations (only accounts for mature female worms, early infestations can be missed, host and environmental variations are not taken into account, etc.) and they both offer different advantages and have specific limitations as listed below:

Fecal egg count

<table>
<thead>
<tr>
<th>ADVANTAGES</th>
<th>LIMITATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Identify high shedders</td>
<td>• Targeted to Trichostrongyle type eggs</td>
</tr>
<tr>
<td>• Assess pasture contamination</td>
<td>• Unable to ID Trichostrong. Type eggs</td>
</tr>
<tr>
<td>• Assess dewormer efficacy</td>
<td></td>
</tr>
</tbody>
</table>

Fecal Float

<table>
<thead>
<tr>
<th>ADVANTAGES</th>
<th>LIMITATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Less targeted</td>
<td>• Not able to assess dewormer efficacy</td>
</tr>
<tr>
<td>• May be better for individual cases</td>
<td>• Unable to ID Trichostrong. type eggs</td>
</tr>
</tbody>
</table>
Fecal Egg Count Interpretation

It is difficult to find clear guidelines for fecal egg count interpretation. The inability to distinguish between Tricostrongyle type species can make it hard to predict worm burden. *Haemonchus contortus* is a very prolific parasite compared to Ostertagia or Tricostrongylus. Therefore, 1000 EPG may not be terribly high for *Haemonchus* but it can be very concerning for Ostertagia. When looking at fecal egg count results it is important to also gather information about the flock or herd, the clinical signs, and the time of the year when the sample was collected as this information may support infestation with one specific parasite over another one.

Holistic Approach

A good parasite control program should not rely solely on anthelmintic drugs. There are many other ways to control gastrointestinal parasites. Some of these include:

PASTURE ROTATION: This is commonly done by many producers but often times it is not done properly. Depending on the area of the country and on whether conditions it is advisable to let the pasture rest for 3 to 6 months before it is used again for animals of the same species. It is a good practice to mow the pasture short after the animals are removed since exposure to sunlight can decrease pasture contamination.

GRASS LENGTH: The infective L3 prefers a humid environment and therefore it is more commonly found in the lower 3 inches of grass. When the pastures are overgrazed, the animals will be ingesting a higher load of larvae.

GENETICS: certain breeds and even genetic lines within breeds show different degrees of resistance to certain parasites. Some sheep breeds that have greater resistance to nematodes include: Florida native, St. Croix, Katahdin, and Gulf Coast Native. The heritability of resistance is about 0.25 so it will take some years to see the benefit of this selection process.

ELIMINATE HIGH SHEDDERS: it is estimated that about 20% of the animals in a herd harbor 80% of the parasites. It is very important to identify and eliminate these high shedders from the flock or herd to decrease pasture contamination and to eliminate those genes.

NUTRITION: it is known that diets deficient in protein and trace minerals can have a negative effect on the immune system. Animals that are overall healthy and have a proper nutrition and body condition score will be less likely to succumb to parasite infestation[2].

TANINES: grazing small ruminants on tannin-rich plants such as *Sericea lespedeza* have been associated with reduced nematode burdens and can also help prevent bloat. Tanines are known to bind to proteins and prevent their degradation in the rumen but the exact mechanism for reduced parasite burden is not fully understood.

COOPER SUPPLEMENT: supplementation with copper oxide wire particles has been found to reduce parasite (*Haemonchus contortus* in particular) load in small ruminants. The mechanism is not fully understood. It is believed that copper may have a direct effect on internal parasites and
it may also help boost the immune system. The easiest way to dose sheep and goats with copper is to use copper boluses (Copasure). To decrease chances for toxicity problems animals should only be bloused once or twice in a worm season. The recommendation is to only dose the animals that need it in order to reduce risk of resistance. A chart with recommended dosages can be found in the American Consortium for Small Ruminant Parasite Control website.

VACCINE: a vaccine against *Haemonchus* has been developed and it is commercially available in Australia (BarebervaxTM)[3]. This vaccine targets an intestinal cell of the parasite (hidden antigen) and it shows promise. Five doses at 4-5 week intervals are recommended which can be a challenge for many producers.

MAINTAIN REFUGIA: it is important to maintain a population of worms that are susceptible to dewormers in order to “dilute” resistant worms. If the susceptible worms are eliminated, the resistant worms will thrive and reproduce more due to lack of competition. One way to accomplish this is to decrease exposure to dewormers by only deworming the animals that need to be dewormed. It is recommended to do targeted deworming instead. Ideally, fecal exams should be performed on the animals with high FAMACHA and/or low body condition score and a treatment plan should be implemented.

INCREASE EFFICACY OF DEWORMERS: it very important to avoid underdosing animals when using dewormers. Parasites with partial resistance (heterozygous) will be more likely to survive and carry on those resistance genes to future generations and possibly generating some fully resistant parasites. Goats have a higher metabolism than goats and therefore should be dosed with higher doses when using anthelmentics that are labeled for sheep or cattle. Another practice that can be implemented is to fast animals before deworming orally. Fasting is likely to decrease gastrointestinal transit and therefore increase dewormer efficacy. Oral dewormers should be dosed in the back of the mouth

ISOLATE AND TEST NEW ADDITIONS: many years of proper parasite control can be put at risk when animals from other herds are incorporated. New additions should be isolated from the rest and a fecal exam should be run to assess parasite burden. If the FEC cannot be effectively reduced after deworming it is recommended to not incorporate the animal to the herd. Animals with no significant parasite burden should be placed in a contaminated pasture to populate their intestines with the local worms.