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Using Fecal Egg Counts On Your Farm

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What are Fecal Egg Counts (FEC)?

Analysis of parasite/worm eggs in a fecal sample can be qualitative (eggs present or not) or quantitative (a count). Fecal egg counts are a quantitative measure of the specific number of eggs present per gram of feces (epg; using a known quantity of feces and flotation solution). The worms of concern that we look for/or count are strongylid eggs, including the bloodsucking barber pole worm (*Haemonchus contortus*).

What do FEC tell us?

Quantitative egg counts are important in any parasite control program and can aid producers in monitoring the rate of pasture contamination. In addition, FEC can be used to determine drug resistance and in selecting or culling particular animals. It is important to note that most of the time, FEC should not be used as the only indicator of when to deworm individual animals. It should be used in conjunction with FAMACHA© (anemia) eye scores and other components of the Five Point Check© (body condition scores, presence of diarrhea, bottle jaw (fig. 1), and coat condition) (www.slideshare.net/schoenian/the-five-point-check), possibly along with weight gain or loss, to determine treatment. However, if an animal has an extremely high FEC and no other indicator of parasitism, it is still advisable to deworm. This will limit pasture infestation and exposure of more susceptible animals (young, sick, old) to worm larvae.

FEC to Monitor Pasture Contamination

Monitoring FEC during the parasite season can provide valuable information on whether or not worm numbers are increasing on a pasture. Sheep and goat producers can use this information to determine when to move animals off of a particular pasture to prevent them from developing high levels of worm infection. So, how many samples do you need to take? This will depend on the number of animals you have in your flock or herd. For instance, if you have 40 females, then a good number for testing to get a reliable estimate of the group average would be around 12 to 15 random samples.

Figure 1. Bottle jaw in crossbred doe.

FEC to Determine Drug Resistance

Another use of FEC is in determining drug (dewormer) resistance by conducting a fecal egg count reduction test (FECRT). This method can also be used to determine the effectiveness of natural or alternative treatments as well. A FECRT is an on-farm test that can be conducted by trained producers, veterinarians or extension personnel. To conduct a FECRT, FEC are conducted prior to treatment and 10 to 14 days later on

the same animals. It is recommended that at least 10 to 15 animals with FEC of more than 250 epg be used to determine the effectiveness of a treatment. If you have a small flock or herd, fewer animals can be used, but care must be taken in interpreting these results. A benefit of the FECRT is that it provides a level of parasite resistance, with FECR of more than 95% generally indicating that the drug is effective. Below 95% reduction in FEC, a dewormer will become increasingly less effective as the sole treatment option.

The following formula is used to calculate % of FECR:
% of FECR = [100 x (1 - Post-deworming FEC)]/Pre-deworming FEC

For instance, if pre-deworming FEC are 2,000 epg and post-deworming FEC are 500 eggs/g then:
% of FECR = [100 x (1-500/2000) = 75 % FECR.

Remember, it is very important to know which dewormers work on your farm. Even if a treatment is not more than 95% effective, the information is still helpful in determining which drugs to include in a combination treatment if you have multiple drug resistance. The cost and labor of conducting FEC can be a hindrance to many farmers wanting to do a FECRT on their farm. A possible way of reducing this cost is the use of pooled composite samples instead of individual samples for FEC in treatment groups. To learn more about this approach please visit the following site: www.wormx.info/single-post/2017/05/25/Composite-Fecal-Samples.

FEC for Selection/Culling

Parasite resistance and resilience when dealing with a parasite challenge are both heritable traits. Animals with consistently low FEC, low FAMACHA© scores and that rarely require deworming demonstrate signs of parasite resistance. On the other hand, if an animal consistently has little to no indicators of parasitism (based on FAMACHA© /Five Point Check©), but has high FEC, it is considered to be resilient and contributes to pasture infestation. Even though both of these animals are productive, a resistant animal is most desired. Conducting routine FEC allows the identification of resistance or resilient animals to select for breeding.

Limitations of FEC

When submitting samples for FEC, you should remember that methods differ by lab and technician. The most common quantitative (epg) method for conducting a FEC is the Modified McMaster Technique (for more information: https://docs.wixstatic.com/ugd/aded98_7d682cccd0ea4f01a43c0fcd46bb8e7f.pdf). When conducting a FEC, the eggs from strongyles all look the same and cannot be differentiated by species. To determine species, a larval identification (for all species) or a Peanut-agglutination test (barber pole worm identification only) must be conducted. In addition, FEC varies from day to day due to variability in egg producing capacity of worms, so eggs are not evenly distributed in fecal matter. Also, loose stools/diarrhea underestimate FEC, and dormant larvae present in the animal do not lay eggs. Even though these limitations exist, a high FEC still suggests that an animal's worm load is high. When used in conjunction with other sustainable integrated parasite management techniques, such as FAMACHA© scoring and pasture management, FEC are an integral tool in combating internal parasites on your farm.

Additional Resources

Zajac, A., K. Petersson, and H. Burdett, 2014. "Why Do Sheep and Goat Fecal Egg Counts." https://web.uri.edu/sheepngoat/files/Using-FEC_-Final2.pdf

Cole, G.C., C. Bauer, F.H.M Borgsteede, S. Geerts, T.R. Klei, M.A. Taylor, P.J. Waller, 1992. "World Association for the Advancement of Veterinary Parasitology (W.A.A.V.P.) methods for the detection of anthelmintic resistance in nematodes of veterinary importance." Vet. Parasitol. 44:35-44.

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