Fecal Egg Counts

Collect, Process, and Analyze FEC Samples

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Introduction

Small ruminant animals are susceptible to infection by a number of internal parasites. One of the most problematic parasites is the barber pole worm (*Haemonchus contortus*) belonging to the suborder Strongylida. This microscopic roundworm, or nematode, is a prolific reproducer and a single female can produce around 250,000 eggs during its lifespan of 25-50 days. The barber pole worm is a blood sucker that resides in the intestines (Figure 1.). Infected animals will appear anemic (pale eye and gum membranes), lethargic, and may have reduced milk production. "Bottle jaw" is another symptom that occurs from fluid build-up under the animal's jaw. Although all ages of animals can become infected, those that are 6 months or younger are more susceptible. Death may result in severely infected animals or in animals with underlying health conditions.

The process by which we evaluate the number of parasites in an infected animal involves evaluation of their fecal material. Parasite eggs can be separated from fecal debris using a flotation fluid (saline solution). The buoyant nature of parasite eggs allows them to float to the surface and be viewed at the top of a specialized microscope slide (Figure 2). Fecal egg counts can be used to identify and measure the amount of strongylid eggs per gram of manure. Samples must be viewed through a compound microscope with magnification from 100 to 400x. The following is a summary of the Modified McMaster Fecal Egg counting procedure developed by the USDA Sustainable Agriculture Research and Education Program in collaboration with The University of Rhode Island and Virginia Tech.

Conducting Fecal Egg Counts

Sample Collection. To accurately assess the levels of parasitic worms in each animal, fresh fecal samples need to be collected and analyzed for each individual animal. Samples should be taken directly from the animal and not collected from the ground. Steps for collecting a proper rectal fecal sample can be found on page 2 of the McMaster Fecal Egg County Procedure. After samples have been collected, make sure that they are labeled and stored in the refrigerator. If many samples need to be collected at one time have a cooler with ice handy to store samples until they can be put into the refrigerator.
Alternatively, samples can be collected from animals IMMEDIATELY after depositing; however, feces that sit on the ground can become contaminated by many other organisms. Samples are more readily collected from animals that have been at rest. If necessary, pen the animals for a while before collecting. Never collect samples from young animals.

Sample Processing. Samples are macerated, mixed with flotation solution and strained through mesh fabric like cheesecloth. This liquid solution is then loaded into specialized McMaster slides for viewing with a compound microscope. It is important to load the two chambers of the McMaster slide without allowing air bubbles. Air bubbles reduce the amount of solution in each well and alter the true egg count. To reduce the likelihood of air bubbles, use a transfer pipette to load the wells from the top by holding the slide at a 45° angle.

Sample Analysis. The saline solution added to the sample allows strogylid eggs to float to the surface. Eggs can be viewed with a compound microscope and counted. Count only the eggs inside of the blue lined wells (Figure 2). Focus the microscope on the bule lines to ensure that you are viewing the top of plane of the microscope slide. Count the eggs in both chambers, add them together and then multiply the sum by 50. This gives the number of eggs per gram of fecal material. Treatment thresholds have been established based on parasite populations. Consult your veterinarian for decisions on whether to treat your animals.

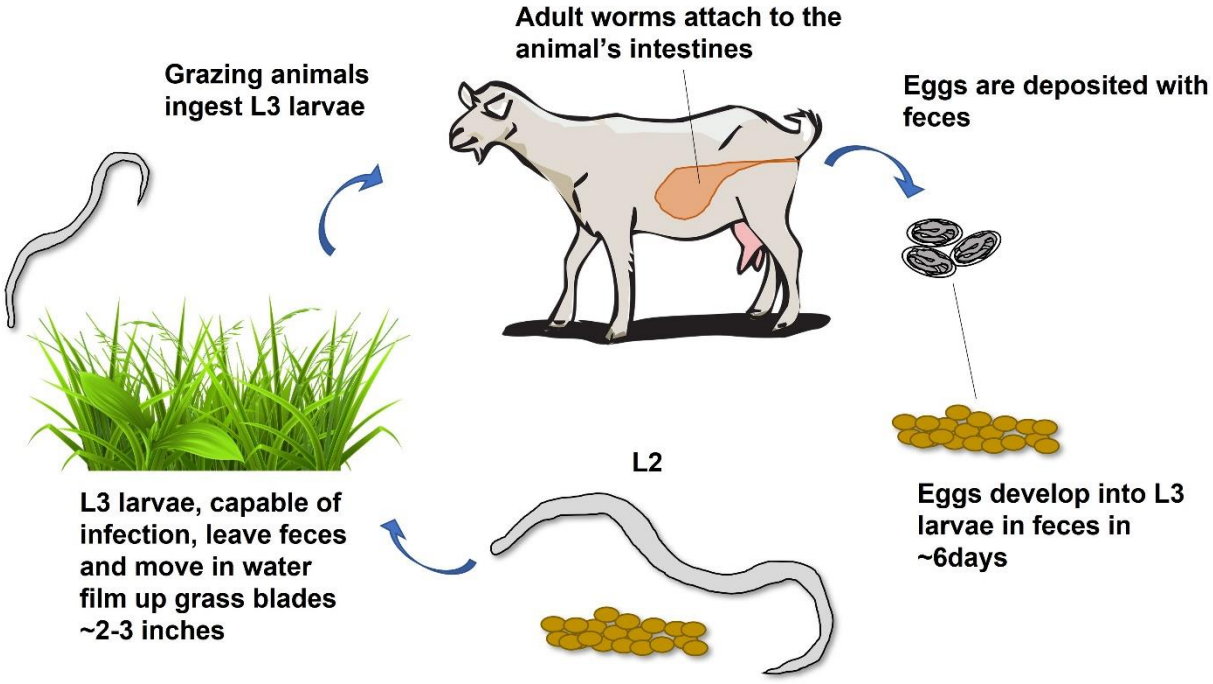

Figure 1. Life cycle of the barber pole worm.

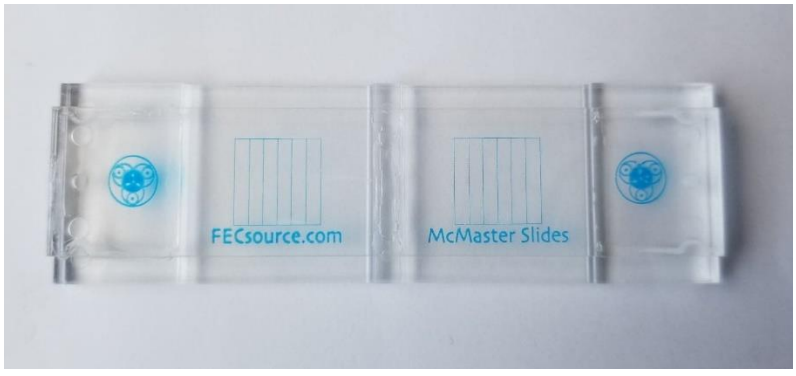

Figure 2. McMaster microscope slide.

References

Zajac, A., Petersson, K., and Burdett, H. 2014. How To Do The Modified McMaster Fecal Egg Counting Procedure. Virginia-Maryland Regional College of Veterinary Medicine. Virginia Tech. University of Rhode Island. https://web.uri.edu/sheepngoat/files/McMaster-Test_Final3.pdf