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School of Agriculture, Fisheries and Human Sciences
Cooperative Extension Program

Animal Science

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Fecal Egg Counting for Sheep and Goat Producers

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Introduction

A fecal egg count (FEC) is a simple procedure you can perform at home to get an approximation of the parasite load your sheep or goats are carrying. You can also use the FEC to find out if your dewormer is still effective or if the gastrointestinal parasites in your herd or flock have become resistant to it.

How to Conduct a Fecal Egg Count

To conduct a fecal egg count, you will need a few items, most of which you can find around the house. You will need:

- Small disposable cups
- Marker
- Small bowl
- Tea strainer
- Craft (popsicle) sticks
- Sugar
- Pitcher
- 30 cc syringe
- 3 cc syringe
- Gram scale
- Disposable exam gloves
- Obstetrical lubricant
- Eye dropper
- McMaster egg counting slide
- Microscope

The microscope need not be expensive. Microscopes capable of 100x magnification can be purchased for less than $100. You should look for a 10x wide field lens and a bright light source. Dissecting microscopes cannot be used for FEC. McMaster egg counting slides are available for $15 each (www.vetslides.com). Wash the slide well just before you load it with your sample solution, as the damp slide will more easily fill with the sample.

Label each small cup with the number of the animal from which you will collect some feces. You may be able to collect fresh feces if you see the animal defecate. Otherwise, use an exam glove and lubricate the index finger. Insert your finger into the rectum of the goat or sheep and gently remove about 8-10 fecal pellets and place them in the cup. You will only need 2 grams of feces, so this will ensure you have plenty.

Mix 5 parts sugar to 4 parts water to make your sugar solution. An easy measurement is 1¼ cups of sugar in 1 cup of water. It may take some time and a little heating to get the sugar to dissolve completely.

If you have a gram scale, weigh out 2 grams of feces for each animal and discard the rest. If you do not have a gram scale, use a 3 cc syringe and pack 2 cc (2 ml) of feces into the syringe to approximate 2 grams. You can cut the tip of the syringe off to make it easier to get the feces out of the syringe once you have measured the sample. Remember to keep each animal's sample separate. Place the feces in the tea strainer and put the tea strainer in the small bowl. Use the 30 cc syringe to measure 28 cc (or ml) of the sugar water solution and add it to the bowl.

Crush the fecal pellets in the tea strainer with a craft stick so that they begin to dissolve in the sugar water solution. The tea strainer will keep the larger fibrous particles from getting into your sample so you can see the parasite eggs better under the microscope. Make sure the fecal pellets dissolve as completely as possible, without getting too much fiber in the final sample.

Remove the tea strainer and discard the fibrous material that remains in it. Stir the sugar water/fecal solution with your craft stick to thoroughly mix the sample. While the solution is still swirling, use the eye dropper to collect some of the fluid. Gently but quickly squeeze the fluid onto the McMaster egg counting slide. The fluid should move fairly easily and evenly across the chamber of the slide. Repeat the procedure, including stirring the sugar water/fecal sample and load the second chamber.

Determining Parasite Load

The McMaster egg counting slide has two chambers, each of which has a grid etched into the surface of the slide (Figure 1).

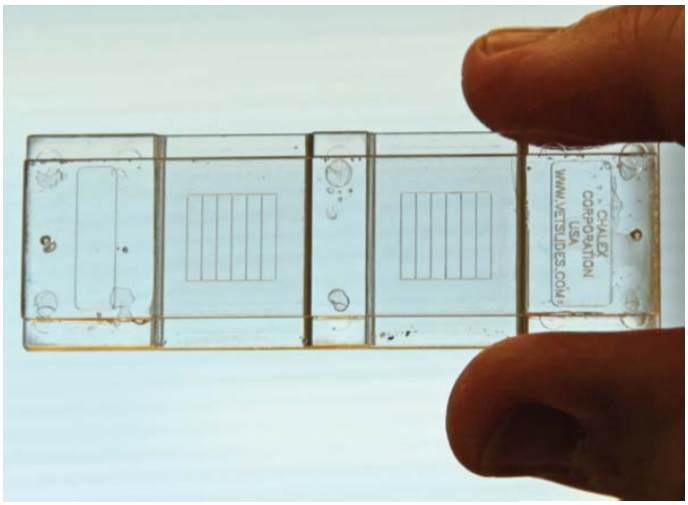

FIGURE 1. McMaster egg counting slide.

Allow the sugar water/fecal sample to settle briefly (about 5 minutes). You may use this time to prepare the next sample for counting. Use the 4x or 10x objective (lens) and count the parasite eggs you see that are in the grid area. Start by focusing the microscope on the air bubbles (Figure 2). Air bubbles

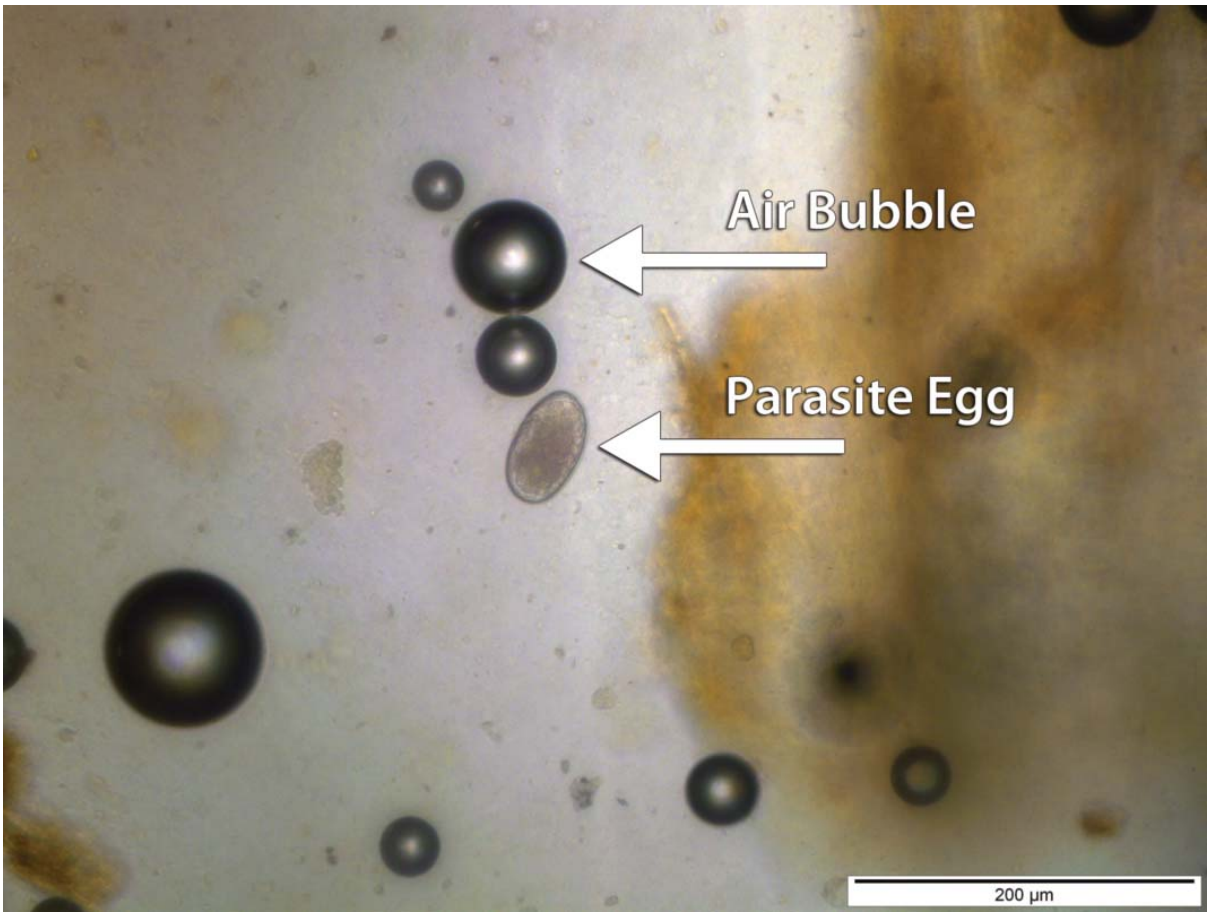

FIGURE 2. Air bubbles are round, bright in the middle and dark around the edges. Parasite eggs are oval, dark in the middle and lighter around the edges.

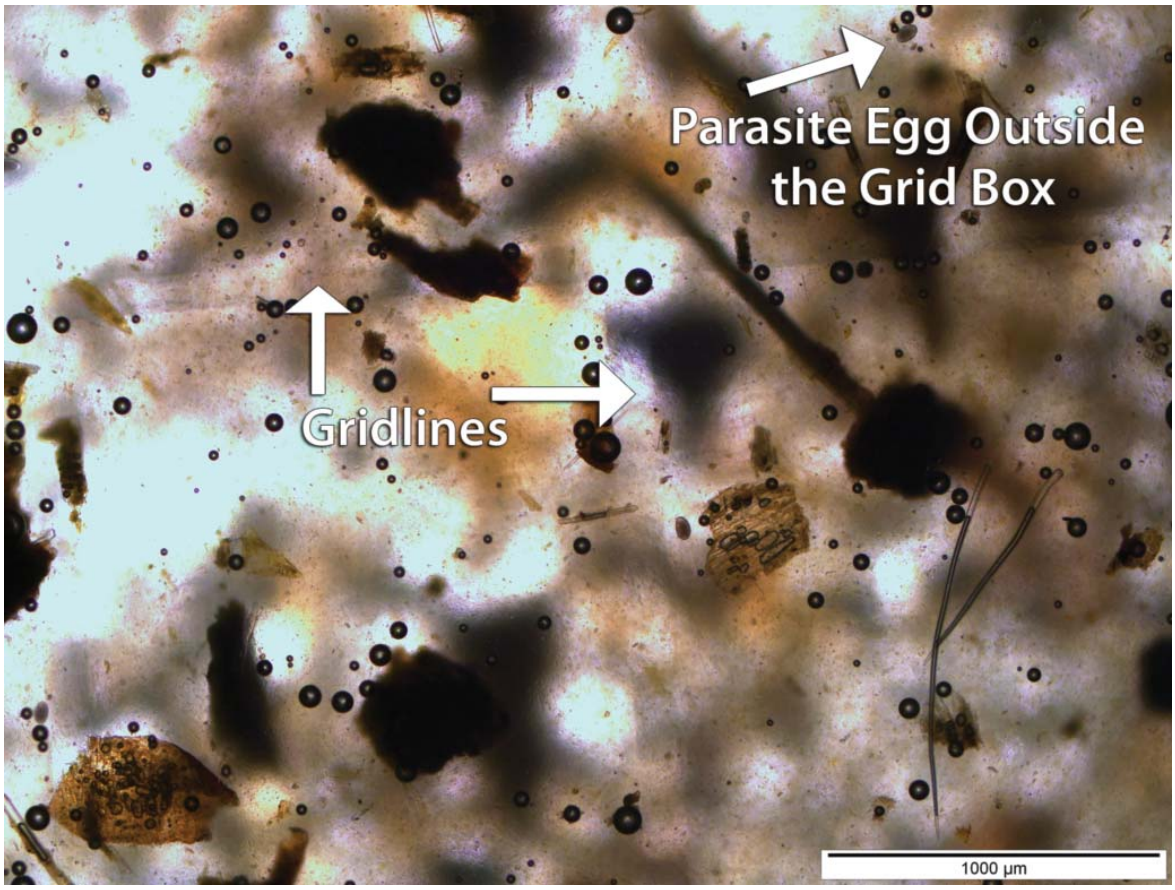

FIGURE 3. Notice the gridlines marked by the arrows in the photo. Too much fibrous material or a dim light source can make finding the gridlines difficult. Notice also the parasite egg that falls outside the grid box. This egg should not be counted to determine your fecal egg count total.

will float at the same level as the parasite eggs, but they are easier to find. Air bubbles are round and will be dark around the edges and bright in the middle. Parasite eggs will be oval and lighter around the edges and darker in the middle. You may want to use a clicker counter (available for under $20) to keep track of your count.

Do not include eggs that are outside the gridlines of the slide or you will over-count the number of eggs. There are usually two knobs beneath the stage where the slide rests. These knobs allow you to move the slide up and down and from side to side slowly so you can get an accurate count. The gridlines on the slide can often be difficult to see in samples that contain too much fibrous material or if the microscope's light bulb needs to be replaced (Figure 3).

Write down the animal number and number of eggs in the fecal sample. Add the number of eggs counted in each chamber together and multiply the total by 50. This will give you the number of eggs per gram of feces in your sheep or goat. For example:

Animal ID	Eggs in Chamber 1	Eggs in Chamber 2	Calculation	Total
101	20	23	(20 + 23) x 50	2150 eggs per gram
103	18	15	(18 + 15) x 50	1650 eggs per gram

Fecal Egg Count Reduction Test

The Fecal Egg Count Reduction Test (FECRT) is a way to measure how effective your dewormer is. Gather a sample of sheep or goats from your herd or flock. Six animals are enough, but 10-12 are better because animals react differently to the dewormer. Collect a fecal sample from each animal, then treat the animals with your dewormer as you normally would. Count the number of parasite eggs in the fecal samples and record the numbers where you will not lose them. Two weeks after you have dewormed your sample animals, collect a fecal sample from the same animals and count the eggs again. Subtract the number of eggs in the second sample from each animal

from the number of eggs in the first sample from each animal and divide the number by the number of eggs in the first sample. Multiply the result by 100 to get the percent of worms killed. For example,

Animal ID	Sample 1	Sample 2	Difference	Percent kill
101	2500	250	2250	2250 ÷ 2500 x 100 = 90%
203	1900	300	1600	1600 ÷ 1900 x 100 = 84%
155	2450	450	2000	2000 ÷ 2450 x 100 = 82%

The average percent kill would be (90 + 84 + 82) ÷ 3 = 85%.

What to Do With Your Results

Fecal egg counts alone will give you some idea of the level of parasite infection your animals are carrying. But some internal parasitic worms produce many more eggs than others. In sheep and goats the gastrointestinal parasite of primary concern is the Barber Pole worm (*Haemonchus contortus*). During the warmer parts of the year, and if the Barber Pole worm is prevalent on your farm, you should deworm your dry does, dry ewes, bucks and rams when the fecal egg count goes above 2,000 eggs per gram. Lactating females and young stock (yearlings or younger) are more susceptible to the Barber Pole worm and should be dewormed if the count exceeds 1,000 eggs per gram. Lactating dairy does should be dewormed if there are more than 750 eggs per gram.

During the cooler part of the year when the Barber Pole worm becomes less predominant, you may be seeing eggs from the Brown Stomach worm (*Ostertagia ostertagi*) or Bankrupt worm (*Trichostrongylus colubriformis*). They produce fewer eggs than the Barber Pole worm. Sheep and goats with half the fecal egg counts of those listed above should be dewormed if either the Brown Stomach worm or Bankrupt worm is suspected or confirmed.

Fecal egg counts should not be the only tool you use to decide whether to deworm your livestock. FAMACHA scoring is better for deciding when you need to deworm for the Barber Pole worm. The Barber Pole worm, Brown Stomach worm and Bankrupt worm will all cause loose feces or diarrhea, rough hair coats, poor weight gains or loss of condition. If you see any of these signs in your sheep or goats, especially if you also have high fecal egg counts, you should consider deworming your animals.

The FECRT can be used to decide whether your dewormer is still effective. If your current dewormer is still effective, the number of parasite eggs per gram of feces should drop by at least 50 percent. If your dewormer is losing its effectiveness, you may consider combining it with a new class of dewormer to increase the useful life of both dewormers. Remember to give the *full dose of both dewormers* when you combine your less effective dewormer with a new class of dewormer. Once the FECRT shows your first dewormer is no longer appreciably reducing the number of eggs per gram, you should switch to a new class of dewormers.

Summary

A fecal egg count is a simple procedure you can perform at home to determine the parasite load your sheep or goats are carrying or to find out if your dewormer is still effective against the worms on your farm. Creating a home fecal egg count kit is relatively inexpensive, and the procedure is easy. Deworm your sheep and goats when the fecal egg count becomes too high, but use FAMACHA scores and other signs of parasite infection to decide which animals to deworm and when to deworm them. The fecal egg count reduction test can be used to tell you when your dewormer is no longer effective and it is time to change to a new class of dewormer.

Reference

The Southern Consortium for Small Ruminant Parasite Control. Parasite Control for Goats: Doing Your Own Research and Fecal Egg Counts. 2006. http://www.scsrpc.org/SCSRPC/Publications/part6.htm accessed on April 18, 2012.

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