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Fecal Egg Counts in Arkansas Livestock

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What is a Fecal Egg Count?

Monitoring the internal parasite (re: "worm") populations that occur inside livestock can be accomplished by conducting fecal egg counts (FEC). A qualitative FEC is used to indicate the presence or absence of parasite eggs in a fecal sample. A quantitative FEC consists of taking a fecal sample from an individual animal and identifying the number of parasite eggs found in one gram of feces.

What Fecal Egg Counts Protocols are Commonly Used?

There are different FEC protocols that can be conducted: direct fecal flotation (DFF), passive fecal flotation (PFF), and McMaster FEC technique (MFEC). DFF uses centrifugation to separate the parasite eggs from the fecal debris using a flotation media and can be applied to all livestock fecal samples. PFF uses a flotation media to allow parasite eggs to separate from the fecal debris in the absence of centrifugation, however, only the heaviest debris will settle, making it difficult to get an accurate count. PFF can be applied to all livestock fecal samples. MEFC is a technique that can be utilized by producers to conduct fecal egg counts on their own livestock operation.

What Do Fecal Egg Counts Measure?

Nematode parasites are the most important parasitic worm class found in livestock. There are many different species that are found in the gastrointestinal tract that have visually similar eggs; these are grouped together and called 'strongyles' or 'trichostrongyles' (e.g. *Haemonchus, Cooperia, Ostertagia, Trichostrongylus, Oesophagostomum*, etc.). Strongyle species cannot be differentiated based on egg identification. The eggs of these parasites are passed in the feces onto pasture where they become infective larvae and are then consumed by herbivore livestock. Strongyle eggs can be enumerated by conducting a DFF and MFEC; however, strongyle eggs cannot be differentiated simply based on a FEC. Other common parasites of interest include the genera *Nematodirus*, *Strongyloides*, and *Trichuris*. It is important to note that only the mature, reproducing, egg-laying female strongyle population can be assumed by conducting a fecal egg count; immature and male populations cannot be assessed as they are not producing eggs.

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When and How Often Should Fecal Egg Counts be Conducted?

Ideally, FEC would be conducted before administering an anthelmintic ("dewormer") due to the increasing prevalence of anthelmintic resistance (AR) displayed by strongyle nematodes in livestock. These targeted, selective treatments will help to slow anthelmintic resistance by eliminating the guess work of when to give a dewormer and should be used in place of blanket treatments, which is giving a dewormer based on convenience rather than diagnosis. Livestock producers should also utilize FEC throughout the year to surveil and monitor internal parasite populations occurring in their animals.

How can Fecal Egg Counts Results be Applied?

Fecal egg counts will give producers a good, working understanding of what is going on inside of their animals. The FEC results can be used to determine when to administer a dewormer, confirm when to make a culling decision, and establish the resistance status of an operation (i.e. how well a dewormer is working). These decisions are based on species specific treatment thresholds. These thresholds, put simply, are differing levels of FEC, dependent on species, that have been established in order to warrant the application of deworming treatments. Treating based on these thresholds will help slow the progression of anthelmintic resistance on a given operation. If an animal consistently has FEC results that are above the treatment thresholds, a producer should consider culling the animal; parasite tolerances and susceptibilities are passed from parents to offspring. A producer can also abide by the "20/80 Rule" when making culling decisions. This rule states that 20 percent of animals are going to carry 80 percent of the parasite population on a given operation, so determining the 20 percent, and culling them will help to remove 80 percent of the parasite problem. If fecal egg counts are conducted before giving a deworming treatment, and again two weeks later (conducted on the same animal), a producer can determine the resistance status of their operation.

What are the Limitations of Fecal Egg Counts?

Though they are the best option available for determining internal parasite burdens in live animals, fecal egg counts do have limitations. First and foremost, a fecal egg count offers a snapshot estimate of what is occurring in a single point in time inside their animals; only a small portion of feces is assessed. Different parasite species have different egg outputs and not all parasites produce eggs at a consistent rate, so there is always a chance that something might be missed with a single FEC. Another shortfall is the fact that only mature, egg-producing female populations can be assessed; this leaves immature, male, and inactive/arrested populations unmeasured. Also mentioned above is the fact that strongyle eggs cannot be differentiated by looking at the eggs, so determining the genus and species of the eggs has to be determined by larval identification or DNA analysis. Loose stools can also affect FEC by underestimating the egg output. In addition to these limitations, different labs can deliver differing FEC results, so in order to have comparable results from assessment to assessment, a producer should use the same lab for every submission to help standardize the FEC for their operation.

Where are Fecal Egg Counts Conducted?

A producer can get FEC conducted at their local veterinary office, a veterinary school, or the state veterinary laboratory. If you live in Arkansas and have a personal farming operation (small or large), the University of Arkansas Fayetteville parasitology laboratory will conduct FEC for you. Your local Cooperative Extension Service office and the UADA small ruminant specialist can help you collect and ship samples to the lab in Fayetteville. For more information, please contact your local extension office or the parasitology lab at 479-575-5846 or email Dr. Chris Tucker at ctucke@uark.edu or Dr. Eva Wray at emcclint@uark.edu.

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