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# "Guide for Interpretation of Fecal Worm Egg Counts in Horses Using "The Modified Wisconsin Sugar Flotation Technique"

Understanding the meaning of worm egg counts will provide the necessary insight needed to help equine owners build a seasonal deworming strategy for their animals. Factors that affect fecal worm egg shedding are numerous so a number of these factors need to be considered every time an analysis is made and a fair assessment of the worm egg counts generated. The age of the animal, the season of the year, the amount of exposure to pasture, the stocking rate of the animals on pasture all affect worm egg counts. The amount of rainfall or moisture on the pasture, the number of degree days with temperatures sufficient to promote parasite develop on pasture is also very important to future infections. Furthermore, the health of the animals, the stage of gestation, stage of lactation, and the numbers and type of parasites present at each examination must be considered. Post-foaling worm egg counts in a mare, for example, are almost always higher than pre-foaling worm egg counts. These factors all directly affect worm egg count interpretations.

Horses have five major types of internal parasites that are commonly diagnosed present in routine fecal exams: threadworms (*Strongyloides sp.*), pinworms (*Oxyuris sp.*), roundworms (*Parascarus sp.*), strongyles (30+ different species of large and small strongyles) and tapeworms (*Anaplocephia sp.*). All eggs are counted and included in the worm egg count total except for tapeworms. Tapeworms are listed simply as positive at a low level (+) 1 to 10 eggs, medium level (++) 11-50 eggs or high level (+++) 50 eggs or greater.

One egg/3gram equals 150 eggs/lb. of manure. A worm egg count of 10 means 1,500 egg/lb. of manure. A worm egg of 300 means 45,000 eggs/lb. of manure or 2,250,000 eggs (in 50 lbs. of manure) excreted daily per horse back into their environment.

**1). Quick Assessment for Equine Based on Fecal Worm Egg Counts:**

| | **Eggs/3 grams** | **Estimated Parasite Level** |
|---|---|---|
| **Strongyle Egg Count:** | **1-10** | **low** |
| | **11-50** | **Moderate** |
| | **50+** | **High** |
| | **300+** | **Very High*** |

- **At this level, it appears that parasites begin to begin to undergo inhibition in tissues.**

A unique feature about horses is that some horses are consistently "low" or "none" shedders. This means that if an animal continually has a low (1-10 eggs) or zero worm egg count, it is impossible to relate this count to worm burden. We find on average 10% of the horses are "low or none shedders" even though they are comingled with heavy shedding horses.

**Inhibited small strongyles cause problems with worm egg count interpretations**: Another confounding issue with equine is that once a small strongyle infection grows in numbers and reaches a certain point within the horse (it appears that every horse is different), the physiology of the gut changes negatively which, in turn, tells the parasites that they are operating in a danger zone such that if the horse dies so will the parasites. The solution for the parasite is to stop development and remain in the tissues until conditions within the gut improves at which time development can begin again. In many cases, a large percentage of newly ingested larvae must undergo an arrested development period or they will, in turn, kill the horse. The most common time for inhibited larvae to begin development is 60-90 days into the grazing in mid-summer or in parts of the country where horses are on pasture all year, inhibition usually occurs about 60-90 days after continual grass growth or during the raining season, along as temperatures range from 70-95° F. This is usually the period when pasture contamination is at its highest level.

The worm egg count for horses, therefore, only indicates the presence of adult parasites within a particular horse. It is impossible to know how many parasites are inhibited at any given time although high egg counts (>300 eggs/3g) indicate a high worm burden which in turn means inhibited larvae are probably present. Most often, when a horse is dewormed, the dewormer kills the adult and late developing larvae but leave the inhibited larvae in the tissues. Following treatment some of these larvae come out the tissues and quickly develop into egg laying adult parasites. In many parts of the country, winter is the most common time for the larvae to come out of the tissues. The reason for this is, as the horse goes into winter, grazing stops, the old worms are either killed by deworming or a natural process where the old worms die off and new worms come out of the tissues. It is not common for a heavily infected horse to have their highest counts in late winter or early spring before grazing begins.

**The most typical seasonal life cycle for (small) strongyles in a horse is as follows:**

1). An infected horse is put out to graze in the spring. This horse begins to ingest infective larvae that has survived from the previous grazing season, while at the same time, this horse is excreting worm eggs from an existing infection (1st generation acquired from the previous grazing season), re-contaminating the pasture for the new year.
2). Depending upon temperature and moisture these new eggs hatch, develop into infective larvae and move away from the manure pats onto the vegetation where the re-infection process begins. In the meantime, (approximately 30-days after turnout), the newly ingested larvae mature into 2nd generation egg-laying adult parasites which begin laying eggs back on the pasture (causing an ever increasingly build-up of larvae on the pasture).
4). As the contamination of the pasture builds for the season, so does the infection within the horse. So now as the season progress millions of eggs are shed daily on the pasture, which means the grazing horse is also exposed to millions of larvae. This is when the physiological trouble starts internally, incoming larvae begin to undergo inhibition or arrested development, worm egg counts lose their meaning and, of course, treatment is no longer effective.