

Updated PEA parasite control guidelines

Summary: Check fecal egg counts 3-4 times per year and deworm based on those results. The benefits include a program targeted toward the individual horse, minimizing unnecessary medication administration and decreasing anthelmintic resistance. It is not necessary to completely remove all internal parasites with each deworming. The goal of deworming is to minimize the risk of future infections by reducing the number of infective stages in the environment.

Why change your deworming protocol?

The overall goal of effective parasite prevention and control is to optimize the health of our equine patients. Health goals range from improved performance under saddle to fewer colic episodes and easy maintenance of ideal body condition. It is not necessary to completely remove all internal parasites with each deworming. The objective of parasite control should be to reduce the level of contamination of the environment with potential infective parasite larvae, thereby reducing the potential of disease within the horse.

When traditional deworming strategies were developed in the 1960s, there were several important differences in the parasite population. At that time, large strongyles were the primary cause of colic and parasitic disease. Today, large strongyles have been practically eradicated from most well-managed herds, and small strongyles (cyathostomes) have emerged as the primary concern. In the 60s, all anthelmintic classes were effective against a variety of parasites, whereas today we see significant resistance to most dewormers available. Of the 3 classes of commercially available and commonly used dewormers, there is significant resistance to 2 of the 3, and there is evidence of emerging resistance to the remaining class. It was previously advised to rotate drug classes at bimonthly intervals to suppress environmental contamination; however we now have learned that this frequent treatment has selected for resistant parasites. In the past it was easy to treat all horses identically, but we now realize the importance of treating horses as individuals.

In the age of anthelmintic resistance, it is imperative to identify those deworming products that are still effective in your horses. Anthelmintic resistance is defined as the development of populations of internal parasites that are not killed following administration of recommended doses of anthelmintic drugs. We are currently seeing evidence of resistance to ALL of the dewormers we have available, therefore routine testing of drug efficacy (using Fecal Egg Counts) is crucial.

Basic parasite life cycle

While different parasites have different life cycles, the basic rule of thumb is that all types progress through similar stages. The life cycle of most internal parasites involves eggs, larvae (immature worms), and adults (mature worms). Eggs or larvae are deposited onto the ground in the manure of an infected horse. They are swallowed while the horse is grazing, and the larvae mature into adults within the horse's digestive tract (stomach or intestines). With some species of parasite, the larvae migrate out of the intestine, into other tissues or organs, before returning to the intestine and maturing into egg-laying adults.

Parasites of primary importance: These are the main disease causing parasites on which current deworming protocols should focus.

Small strongyles: (*cyathostomins*) Larvae invade cecal and colon wall where they molt and grow within fibrous cysts. When emerging from cyst walls, severe inflammation within the gut wall (hemorrhage and edema) results.

Tapeworms: (*Anaplocephala perfoliata*) May cause spasmodic colic, ileal impactions, or ileocecal intussusceptions (telescoping of the ileum into the cecum, typically a surgical colic).

Large strongyles: (bloodworms, *Strongylus vulgaris*) Larvae migrate extensively through liver, peritoneum, and regional arteries, damaging tissues as they migrate.

Ascarids: (roundworms, *Parascaris equorum*) Primary importance is in foals, <1 year of age. May cause ill-thrift, colic, or diarrhea.

Parasites of lesser importance: usually non-pathogenic and less common. These are expected to be controlled by default in a properly designed parasite control program

Bots: (*Gasterophilus*) Fly larvae that attach to the lining of the stomach. Commonly seen yellow eggs on forelimbs in the fall.

Pinworms: (*Oxyuris equi*) Common cause of tail rubbing.

Strongyloides westerii, *Habronema*, *Onchocerca*, *Dictyocaulus arnfieldi*

Signs of parasitism

Weight loss

Diarrhea

Poor growth

Rough hair coat

Recurrent colic

Poor performance

However, most commonly there may be no noticeable signs at all.

Testing and Treatment

The gold standard fecal test is a Fecal Egg Count (FEC). This test differs from a fecal floatation test by quantifying the number and type of parasite eggs per gram of manure, instead of solely identifying type of eggs present.

Early spring (March-April), just prior to turning out on pasture is an ideal time to check a FEC and determine environmental contamination potential. Samples should be collected a minimum of 12 weeks after deworming with ivermectin; 16 weeks after deworming with moxidectin; and 6-8 weeks after deworming with fenbendazole or pyrantel. Checking a FEC before and then 10-14 days after administering a dewormer helps us assess the efficacy of the drug used and identify the possibility of

parasite resistance on your farm. If the second egg count has not decreased by at least 90% as compared to the first, it is likely that some resistance is present.

The FEC test classifies individual horses according to their potential to contaminate the environment with parasite larvae. Horses with a FEC of <200 eggs/gram are “low contaminators”, 200-500 eggs/gram are “moderate contaminators”, and >500 eggs/gram are “high contaminators.” By identifying individuals in this way, we are able to recommend a more specific deworming program. Low contaminators may only need to be dewormed twice per year, whereas high contaminators will require more frequent monitoring and deworming.

It is important to note that a negative fecal examination does not mean the horse is free of internal parasites. Some types of parasites produce eggs only intermittently. Larvae do not produce eggs at all, and may be present in large numbers in a horse with a fecal egg count of zero. Checking a FEC several times in a given year can help to more completely characterize their parasite load and potential for contaminating their environment.

Tapeworms may not be identified in a FEC, as tapeworm eggs are shed only sporadically. There is currently a tapeworm antibody test available at the University of Tennessee, and we do send out samples for evaluation upon request.

Foals up to 1 year of age require a slightly different testing and deworming plan than adults because their immune system and parasite loads are different. FEC should be evaluated at 60 days of age to determine the type and amount of parasites present, and then 10-14 days following the first deworming to assess drug efficacy. An individual plan can be determined at that time.

Deworming Drugs Available

There are 3 drug classes available to kill parasites in horses, and we are currently seeing parasite resistance to ALL classes. There are no new drugs on the horizon, so if these fail, we are left without treatment and prevention options.

Benzimidazoles

Fenbendazole (Panacur): at high dose, larvicidal for migrating large strongyle larvae, some encysted small strongyles. Widespread small strongyle resistance at low dose.

Pyrimidines

Pyrantel pamoate (Strongid): effective against adult parasites only; some small strongyle resistance seen. Double dose effective for tapeworms.

Pyrantel tartrate (Strongid C or C2x daily dewormer): some strongyle resistance seen, FEC >100 eggs/gram during a regimen suggests resistance.

Macrocyclic lactones

Ivermectin: larvicidal for migrating large strongyle larvae. Some ascarid resistance seen.

Moxidectin (Quest): larvicidal for migrating large strongyle larvae and some encysted small strongyles. Some ascarid resistance seen.

Praziquantal (combination product in Zimectrin Gold, Equimax, Quest Plus): effective tapeworm dewormer.

Adequately dosing each horse is key to maintaining drug success. A weight tape is the most readily available means to estimate body weight, and should be done at the time of deworming. It is also important to ensure that your horse swallows the entire dose without spitting it out.

Environmental Management

Chemical control using dewormers is just one part of a complete parasite control plan. As parasites are primarily transferred through manure, good management is essential:

Keep the number of horses per acre to a minimum to prevent overgrazing and reduce pasture contamination with parasite eggs and larvae

Pick up and dispose of manure regularly (at least twice a week, even in dirt or sand yards)

Do not spread manure on fields to be grazed by horses; instead, compost it in a pile away from the pasture

Mow and harrow pastures periodically to break up manure piles and expose parasite larvae to the elements (larvae can survive freezing, but they cannot tolerate extreme heat and drying for very long)

Consider rotating pastures by allowing sheep or cattle to graze them, thereby interrupting the life cycles of equine parasites

Keep foals and weanlings separate from yearlings and older horses to minimize the foals' exposure to roundworms and other parasites

Use a feeder for hay and grain rather than feeding on the ground

Remove bot eggs regularly from the horse's haircoat (flea combs work well in some instances)

Keep new horses separate from the herd for 14 days, check a Fecal Egg Count, and deworm according to veterinary recommendations prior to introducing him to the existing herd

Please do not hesitate to contact Dr. Parrott, Dr. Graboys, or Dr. Limone for an individual plan and with additional questions or concerns regarding the current recommendations.