

Equine Parasites

Low Shedders- Two treatments per year (approximately after first hard frost and after last hard frost) with ivermectin or moxidectin. Use product with praziquantel in the fall.

Mod Shedders- Three treatments (approximately after first hard frost, mid summer, and after last hard frost) per year with ivermectin or moxidectin. Add praziquantel in the fall.

High Shedders- Four treatments per year (every 3 months) with moxidectin. Use product with praziquantel in the fall.

Deworming Guidelines

The AAEP (American Association of Equine Practitioners) has created new guidelines for parasite control and monitoring. There are now separate guidelines for adults and young horses that are less than 3 years old.

The AAEP Task Force developed these recommendations based on 4 criteria.

1. *Strongylus vulgaris* and other large strongyles are rare, cyathostomins (small strongyles) and *Anoplocephala* (tapeworms) are the major parasite of adult horses, and *Parascaris* spp. are the major concern in foals and weanlings.
2. Dewormer resistance is common in cyathostomins and *Parascaris* spp.(roundworms) and must be considered in treatment of horses.
3. Adult horses vary in their susceptibility to infection and level of shedding and require individualized treatment.
4. Horses less than 3 years old are more susceptible to infection and require special attention.

The traditional rotational deworming which is commonly recommended by veterinarians and online retailers is based on a concept developed 40 years ago. These recommendations were based on the fact that large strongyle was the most common parasite. By rotating the dewormers the worm could be killed before shedding could occur and prevent re-infection and contamination of pastures. Small strongyles were not considered a major pathogen, but they are now considered a primary equine pathogen. Roundworms are now recognized as a major pathogen of foals and weanlings and tapeworms is now a cause of ileal colic in horses. Small strongyles, tapeworms, and roundworms all have a very different life-cycle from large strongyles and the strategy for controlling them is not appropriate for the other parasites.

40 years of frequent deworming has selected for high levels of resistance in the small strongyles and roundworms. Small strongyles are very common and all grazing horses are infected. Fortunately they are a relatively mild pathogen and only cause disease when they reach a very high level of infection. Because of this and the low levels of large strongyles, frequent deworming is not necessary to keep adult horses healthy. It is more important to properly time deworming based on the transmission cycle and parasite burden of the individual horse.

Anthelmintic Resistance- The ability of worms to survive a treatment that is generally effective against the same species.

Parasite Refugia- The population of worms that escape selection with the drug at the time of treatment. These are worms that are in a life stage that is not treated by dewormers or are free living in the pasture.

Fecal Egg Count Reduction Test (FECRT)- This test is used to determine the amount of resistance in a population to a dewormer. A fecal sample is collected before deworming and a second sample is collected 14 days after treatment.

Egg Reappearance Period- This is the time between the last effective treatment and resumption of significant strongyle egg shedding.

1. Fenbendazole/Oxibendazole: 4-5 weeks
2. Pyrantel: 4-5 weeks
3. Ivermectin: 6-8 weeks
4. Moxidectin: 10-12 weeks

Strongyle Egg Shedding/Contamination Potential- Adult horses grazing together share the same risk of infection, but shed very different amounts of eggs into the environment. 15-30% of the horses shed approximately 80% of the eggs. The eggs are passed via fecal oral transmission. They are shed into the environment through the manure and picked up off the grass that is ingested.

1. **Fecal Egg Count-** Horses that have a low FEC will tend to have a low FEC and horses that have a high FEC will tend to have a high FEC. This is due to the fact that some horses immune systems effectively fight parasite infection. FEC should be done after the effects of the previous dewormer are gone. Some worms seem to reduce shedding when environmental factors are not good for transmission. Therefore in cold winter months and hot, dry summer month FEC may be a less reliable measure.
 - a. **Low Shedders** 0-200 Eggs/Gram 50-75% of population
 - b. **Moderate Shedders** 200-500 Eggs/Gram 10-20% of population
 - c. **High Shedders** >500 Eggs/Gram 15-30% of population

The goal of good parasite control is not to eradicate the parasites, this cannot be achieved. Both large and small strongyle cause the most damage in the larval stages which are generally resistant to treatment with dewormers. The goals of effective treatment are:

1. Minimize risk of parasitic disease.
2. Control parasite egg shedding.
3. Maintain effective drugs and avoid further resistance.

FEC should be used to help determine the amount of shedding from individual horses in order to meet these goals. FEC is necessary to develop an effective parasite treatment plan. There are several reasons to perform FEC. First is to determine the effectiveness of deworming using the FERCT. This also allows for the determination of the ERP for the most recently used dewormer. It also gives a way to determine the shedding status of individual horses and can help determine the parasite burden in foals and weanlings. The FEC does have limitations though. It does not always determine the accurate number of total adult worms. It also does not detect immature or migrating larvae, tapeworms, and pinworms.

Samples- Samples should be stored in a leak proof container and should be as fresh as possible. Samples over 12 hours old should be refrigerated as soon as possible. Samples should be tested within 7 days of collection but eggs can remain intact longer if properly refrigerated. Samples should never be frozen because this damages eggs and lowers the recovery rate. Finally, diarrhea samples are not acceptable for FEC. They can be qualitatively tested but does not provide a reliable quantitative measurement.

What Does The Fecal Egg Count Mean?

In managed horse populations 99% of the strongyle eggs seen are cyathostomins. In neglect cases the number is about 90%, with the remaining being the more pathogenic large strongyle species. It is not possible to distinguish the two types of eggs without culturing the feces and recovering the larvae.

The “Others”

Tapeworms (*Anoplocephala perfoliata*)- Prior to the widespread use of dewormers the prevalence of tapeworms in necropsied horses in Kentucky was approximately 50%. The prevalence in other regions is not known but tapeworms are common in the U.S. The Oribatid mite serves as the intermediate host and is common in grass pastures where moist environmental conditions occur. They are less common in arid areas and this leads to lower incidence of tapeworm infection. Tapeworm infections are difficult to diagnose due to the fact that eggs are only shed intermittently. Unless a horse is infected with a large amount of worms the likelihood of seeing eggs in feces is a chance event. It appears that a single treatment with praziquantel in the late fall or early winter should be given after transmission ends due to cold weather.

Parascaris spp.- Roundworms are the most important cause of poor growth in foals. Migrating larvae can cause intestinal impaction, airway inflammation, cough, and nasal discharge. The parasite is ubiquitous in breeding operations, resistant to environmental influences, and can remain viable for years in organic material and soil. High levels of resistance have been noted for ivermectins and moxidectin. Given this resistance, fenbendazole at 10 mg/kg for five consecutive days may be the only option for treatment.

Bots (*Gasterophilus spp.*)- Bots are rarely associated with clinical disease. It is recommended to treat with a boticide at least once a year in the late fall or early winter to decrease the transmission next year. Currently only ivermectin or moxidectin are effective against bots.

Methods of Control

Environmental Approaches- Eggs hatch under moderate temperature and moisture. Cold slows or stops the development and excessive heat kills larvae and eggs. Manure can be heated and composting of bedding will generate enough internal heat to eradicate parasites. Non composted manure should never be spread on pastures. Leaving pastures fallow may or may not reduce transmission due to the wide variability of survival times being temperature dependant. The optimal temperature range for development of larvae and eggs is between 77-91 degrees F.

Considerations for Mature Horses- Focus should be placed on control of cyathostomins. One or two yearly treatments are sufficient to prevent occurrence of large strongyle. Consider a treatment for encysted cyathostomins, typically toward the end of the grazing period which is in the fall. A cestocide for tapeworms should also be included annually.

1. Evaluate dewormers with a Fecal Egg Count Reduction Test at least every 3 years.
2. All horses should be treated one to two times a year for large strongyles, tapeworms, bots, and summer sores.
3. Further treatments should be targeted for high shedding horses.
4. Focus treatment during the seasons of peak transmission, usually spring and fall.

Considerations for Foals, Weanlings, and Yearlings.

1. During the first year foals should receive a minimum of 4 treatments starting at 2-3 months.
2. FEC at weaning
3. Perform a yearly FERCT to evaluate efficacy of dewormers
4. Deworm mares around foaling to prevent transmission of worms through the milk.
5. Recently weaned foals should be turned out on the cleanest pastures.
6. Yearlings and two year olds should be considered high shedders.

General Points

1. Do not underdose horses and foals, use a weight tape for accurate measurements.
2. Use FEC to determine the shedding status of new arrivals.
3. Concentrate drug treatment when local conditions favor transmission and decrease use when conditions are adverse.
4. Consider the following:
 - a. Stocking density- high density increases parasites and parasite load.
 - b. Limited access to pasture or grass will contribute to low FEC.
 - c. Treat youngsters as high shedders.
 - d. Biosecurity, treat with a dewormer before introducing a new animal onto a pasture
 - e. Clean up the environment.

Summary of Parasite Control

There is no such thing as a one size fits all program. All adult horses would benefit from one or two treatments per year. Low shedders have an increased natural immunity and this should cover the other parasites as well. Moderate shedders should receive a third treatment and high shedders should receive a fourth treatment. Moxidectin should be used to suppress shedding in moderate and high shedder.

Adapted from the 2016 AAEP Parasite Control Guidelines

Please call with any questions. We are happy to help you with a deworming plan.