



Internal Parasites, Fecal Egg Counts, and Deworming Protocols

What types of parasites are there?

The most common types of parasites seen in **adult** horses are as follows:

- | | |
|-------------------------------------|----------------------------------|
| 1. Small Strongyles (Cyathostomins) | i.e. - <i>Cyathostomin spp.</i> |
| 2. Large Strongyles (Blood worms) | i.e. - <i>Strongylus spp.</i> |
| 3. Tapeworms | i.e. - <i>Anoplocephala spp.</i> |
| 4. Pinworms | i.e. - <i>Oxyuris equi</i> |
| 5. Botflies | i.e. - <i>Gasterophilus spp.</i> |

Parasite Facts:

- Changes in parasite fauna of horses have evolved over the years.
 - Large strongyles now are considered rare in horses.
 - Small strongyles and tapeworms are more common concerns in adult horses.
- Small strongyles are ubiquitous and **all** grazing horses are infected. They are rarely a cause of clinical disease in horses.
- Dewormer (anthelmintic) resistance
 - Over time equine parasites have developed resistance to many of our commonly used dewormers. Once resistance has been documented, these products often become ineffective. There is now well documented *resistance of small strongyles to benzimidazole and pyrimidine dewormers* (i.e. Panacur, Strongid, Safe-guard, Pyrantel, Anthelcide EQ) in the United States
 - Tapeworms, when present in high numbers, can be a cause for colic in both adults and foals
- Tapeworm and pinworm infections are often missed using a routine fecal egg count.
 - Tapeworm eggs are difficult to find in manure, and infection is most commonly diagnosed by the presence of long flat “ribbon-shaped” adult worms in the manure.
 - Pinworm eggs tend to adhere to the anus and are not shed in the manure.
- Botflies are a common parasite, with their larvae often found in the stomachs of adult horses. They are rarely a cause of disease.



What is a Strategic/Targeted Deworming protocol using fecal egg counts?

Strategic deworming is the practice of deworming horses based on their individual needs and parasite burdens. Fecal Egg Counts (FEC's) are used to identify the types of parasites present and determine whether a horse is a high, moderate, or low shedder of parasitic eggs.

Rotational deworming; the practice of administering alternating dewormers throughout the year, is no longer considered the best practice for equine parasite control. Due to the overuse of deworming products with rotational deworming strategies, parasites have developed alarming rates of resistance to dewormers.

We recommend performing fecal egg counts (FEC) on all horses every 6 months. Many horses exhibit fluctuations in their parasite burden as they age or undergo changes to their environment (changing farms, pasturemates, etc).

****The goal of a successful deworming program is to keep horses healthy, prevent clinical disease, and minimize parasite levels on the farm. Complete eradication of parasites is NOT the goal.**

Comprehensive Management Program of Parasites

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

Some of the procedures listed below can be helpful in reducing parasite burdens:

- 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 during the warmer seasons).
- Do not spread manure on fields to be grazed by horses. Instead, compost it in a pile away from the pasture.
- Mow pastures periodically to break up manure piles and expose parasite larvae to the elements (larvae can survive freezing, but they cannot tolerate extreme heat (>100F) and drying for very long).
- Consider allowing sheep or cattle to graze pastures, thereby interrupting the life cycles of equine parasites.
- Use a feeder for hay and grain rather than feeding on the ground.

Collection Procedure of Manure for FEC:

Step 1: Collect fresh, warm feces (2-3 fecal balls) in a zip-lock bag or fecal container (<12hrs old).

Step 2: Remove all air from the zip-lock bag. Label the bag with the horse and owner's name.

Step 3: Place the bag in the refrigerator until it is delivered to the office. **DO NOT FREEZE** sample.



Targeted/Strategic Deworming Schedule

Low Shedders (less than 200 epg):

	Deworm once yearly during March-October
Option 1	Moxidectin + Praziquantel (Quest Plus)
Option 2	Ivermectin + Praziquantel (Equimax, Zimecterin Gold)

Moderate Shedders (200-500 epg):

	March	September
Option 1	Ivermectin	Moxidectin + Praziquantel (Quest Plus)
Option 2	Moxidectin (Quest)	Ivermectin + Praziquantel (Equimax, Zimecterin Gold)

High Shedders (500 epg and higher):

	March	June	September
Option 1	Moxidectin OR Ivermectin	Moxidectin OR Ivermectin	Ivermectin + Praziquantel (Equimax, Zimecterin Gold) OR Moxidectin + Praziquantel (Quest Plus)



Equine Deworming Chart

Chemical Class	Active Drug	Brands	Mfr.	Large Strongyles	Small Strongyles	Encysted Sm. Strongyles	Roundworms	Pinworms	Lungworms	Bots	Tapeworms	Summer Sores
Macrocyclic Lactones: Avermectin or Milbimycin	1.87% Ivermectin	Eqvalan	Boehringer Ingelheim	X	X				X	X		X
	1.87% Ivermectin	Ivermectin Paste	Generic	X	X				X	X		X
	1.87% Ivermectin	ProMectin E. Paste	Vedco	X	X				X	X		X
	1.87% Ivermectin	Zimecterin	Boehringer Ingelheim	X	X				X	X		X
	1.87% Ivermectin	Bimectin	Bimeda	X	X				X	X		X
	1.87% Ivermectin	IverCare Paste	Farnam	X	X				X	X		X
	2% Moxidectin	Quest Gel	Zoetis	X	X	X					X	
Combined Macrocyclic Lactones: Avermectin or Milbimycin + Isoquinoline	1.87% Ivermectin + 14.03% Praziquantel	Equimax	Bimeda	X	X		X	X	X	X	X	X
	1.55% Ivermectin + 7.75% Praziquantel	Zimecterin Gold	Boehringer Ingelheim	X	X		X	X	X	X	X	X
	2% Moxidectin + 12.5% Praziquantel	Quest Plus Gel	Zoetis	X	X	X	X	X	X	X	X	X
Benzimidazoles	22.7% Oxibendazole	Anthelcide EQ	Zoetis				X	X				
	10% Fenbendazole	Panacur Paste	Merck				X	X				
	10% Fenbendazole	Panacur POWERPAC	Merck				X	X				
	0.05% Fenbendazole	Safe-Guard Equi-bits	Merck				X	X				
	10% Fenbendazole	Safe-Guard Paste	Merck				X	X				
Pyrimidines	43.9% Pyrantel Pamoate	Exodus	Bimeda				X	X				
	43.9% Pyrantel Pamoate	Pyrantel Paste	Durvet				X	X				
	43.9% Pyrantel Pamoate	Strongid Paste	Zoetis				X	X				
	2.11% Pyrantel Tartrate	Strongid C 2X	Zoetis				X	X				