

EQUINE PARASITE CONTROL

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Horses are commonly afflicted by parasites, primarily a group of worms known as the strongyles. Adult horses acquire little immunity to most of these parasites and are quite susceptible to infection and disease. Although the most common result of parasitism is ill thrift, parasites are a major cause of colic. In Kentucky, institution of aggressive parasite control on horse farms consistently reduce the incidence of colics by nearly 90%. In Florida we have reduced the annual incidence of colic at one boarding stable from 24 to 4 per year by instituting proper parasite control.

The most important equine parasites are the large strongyles (particularly *Strongylus vulgaris*), small strongyles (bloodworms or cyathostomes), and ascarids (large roundworms). Under most circumstances these are the parasites that must be controlled in Florida horses. The strongyles are seasonally transmitted, so treatment programs will be coordinated with time of the year whereas ascarids are transmitted year-round, with season having very little effect. Less important, but not to be ignored, are bots, pinworms, threadworms, and tapeworms.

Mature horses are susceptible to all of the above except ascarids and threadworms, whereas foals are not likely to harbor large strongyles until they are 6 months old. The large and small strongyles are acquired primarily by grazing and are dependant upon horses having access to grass. Tapeworms are similarly dependant upon the presence of grass to support the tiny mite that helps spread these tapeworms. These parasites are not transmitted in drylots, barns, stalls, etc. where grass is not available. In contrast ascarids and pinworms can be acquired from grassy or non-grassy environments with pinworm transmission is especially rapid in stabled horses where the delicate eggs are concentrated and protected from direct sunlight.

Cyathostomes ("Small Strongyles")

These are by far the most common and abundant of the major parasites of horses, with infections often exceeding 100,000 worms. Damage to the horse's gut by developing larvae of these worms can lead to ill-thrift, diarrhea and colic.

In cool climates, cyathostome transmission is fairly straightforward. A "spring rise" in worm egg output in the manure of horses causes a dramatic rise in the number of worm larvae on pastures in late summer and autumn. Horses become heavily infected by grazing during this time. In Florida the situation is reversed. Although fecal egg counts remain high year round, infective larvae survive poorly on grass during the summer months. The net result is that most parasite transmission takes place from November to April when horses ingest larvae that developed from eggs shed onto pasture from September to March.

Horses shed cyathostome eggs in their manure. The eggs then hatch into larvae that feed on bacteria in the manure for a week or two before migrating onto blades of grass. Horses then acquire the larvae from the pasture as they graze. The larvae then develop in the wall of the gut for about 4-6 weeks before maturing to egg laying adult worms, although some can remain dormant in the gut wall for a year or more without maturing.

Two important features of cyathostomes, (1) their short life cycles as compared to the large strongyles and (2) their propensity to develop resistance to commonly use wormers, must be taken into consideration when designing control programs. In Florida, treatment at 2 month intervals with ivermectin (Eqvalan), 3 month intervals with moxidectin (Quest), or monthly intervals with most other wormers from September through March will control most cyathostomes, as will continuous daily treatment with Strongid-C during this time.

Unfortunately, many horses are infected with cyathostomes resistant to the benzimidazoles (BZDs), the largest class of wormers. Since there is cross resistance throughout the BZD group, this means that wherever resistance occurs, products containing febendazole (Safeguard, Panacur), oxfendazole (Synanthic), and febantel (Rintal) are not effective. One drug of this group, worms are much slower to develop resistance to oxibendazole (Anthelcide), thus it may be effective when worms are resistant to the other BZDs. BZD-resistant worms are fully susceptible to ivermectin, pyrantel, or moxidectin, and these wormers should be used wherever BZD resistance has been identified. In a recent study in Florida cyathostomes on 10 out of 11 farms were highly resistant to fenbendazole. There is evidence that resistance is now emerging to pyrantel (Strongid) as well because in that same study pyrantel failed to adequately control worms on 4 of 11 farms. In contrast, resistance has not been a problem with ivermectin or moxidectin.

***Strongylus* spp. ("Large Strongyles")**

Strongylus vulgaris is by far the most deadly of the equine worms-by obstructing the arteries supplying blood to the gut, migrating larval stages of this worm are a significant cause of colic. The life cycles of *Strongylus* spp. are similar to those of the cyathostomes except that the larvae of these worms migrate in the horses body for some 6 months before maturing to adults. With *S. vulgaris*, larvae prefer to migrate within the arteries supplying blood to the gut before larvae returning to the gut to become egg-laying adults about 6 months after the 3rd stage larvae were ingested from pasture.

Until more is known about the epidemiology of *S. vulgaris* in the southeastern states, year-round treatment for this parasite is probably required. Given the long time required for this worm to mature in horses (6-months) and moxidectin and the high efficiency of ivermectin for this parasite, treatment at a minimum of 6 month intervals with these wormers would theoretically prevent the shedding of eggs onto pasture and greatly suppress transmission. Since the appearance of ivermectin on the US market, this worm has become much less common and indeed has been eradicated from many properties. Resistance to wormers has not been a problem with this worm. What was once a common and deadly parasite of horses has now become a rarity.

Ascarids (Large Roundworms)

Parascaris equorum, the large roundworm of horses, can be deadly to foals in their first year of life. After that, acquired immunity provides strong protection. Transmission is direct and non-seasonal infected horses contaminate their environment by shedding large numbers of ascarid eggs which are subsequently ingested by other horses. On most breeding farms, transmission is primarily a result of foals ingesting eggs that were passed by foals on the same farm during the preceding year. Since this parasite requires some 11-15 weeks to mature in foals, worming foals at 2 month intervals throughout their first year of life should provide adequate control and prevent a build-up of eggs in the environment that would infect the next year's foal crop. The BZDs, pyrantel, ivermectin and moxidectin all are effective against this worm and drug resistance has not been a problem with this worm.

Bots

Before the appearance of ivermectin, bots were very common on horses. However they often were overrated in their ability to cause disease. Nevertheless high numbers of bot larvae in a horse's stomach can lead to ill thrift and, on rare occasion, death.

The life cycle begins when the adult fly deposits eggs on the horse's coat, usually on the forelimbs for the most common species of bot seen in Florida. The horse is infected by licking the eggs. After migrating in the gums between the horse's teeth for several weeks, the bots move to the stomach for several months before passing out with the manure. The bot then burrows into the soil and pupates with the adult botfly emerging from the pupa several months later.

Bots are highly seasonal in their activities. Adult botflies have been observed flying every month of the year in Florida, but most egg laying occurs in November and December with a second small period of egg laying occurring in May and June, although egg laying may be continuous from fall until spring in southern Florida.

The most important time to treat for bots in northern Florida is in January, after the first hard freeze of the winter has greatly reduced bot activity. A second treatment is probably needed after the spring peak in egg laying is past. A supplemental treatment in November may be

needed in especially bad years or on farms with heavy bot activity. In southern Florida treatments may need to be continued through the winter. Ivermectin and moxidectin are the preferred treatments. Good grooming with a bot knife will remove many eggs before they hatch, but be careful, hatched bot larvae have been known to infect the eye of humans! The practice of forcing bot eggs to hatch prematurely by wiping them with a warm moist cloth is especially dangerous in this regard.

Miscellaneous Parasites

Tapeworms are common in horses-owners frequently complain of seeing the segments in manure. For the most part these worms are harmless although heavy infestations may cause colic. Infection is acquired when horses accidentally swallow a small mite while grazing. The mites are infected by eating tapeworm eggs shed in the manure of infected horses. Treatment is by a double or triple dose of pyrantel in its single dose formulations (Strongid-T or Strongid-P) or daily treatment with the continuously fed form of that same drug (Strongid-C).

Pinworms are nuisance parasites whose ill effects are generally limited to itching and hair loss around the rump and tail head. Infection is more common and severe in stabled horses than horses at pasture because eggs survive longer out of direct sunlight. Adult pinworms live in the lower bowel of horses. At night female pinworms stick their heads out of the anus of infected horses and glue their eggs to the skin. The glue is irritating and causes horses to itch. Horses are infected by accidentally swallowing pinworm eggs, which survive for several months in the shelter of stalls but are quickly killed if exposed to direct sunlight. Pinworms are easily killed with most wormers and usually are controlled as a side effect of programs designed to control cyathostomes. If necessary, pinworms usually can be eliminated from stables by aggressive sanitation and two anthelmintic treatments 1 month apart. Benzimidazoles, pyrantel, ivermectin and moxidectin all are effective.

Threadworms commonly infect young foals. This parasite appears to be relatively harmless although large numbers of eggs may be shed in a foal's manure. If desired, treatment of the mare with ivermectin on the day of foaling is very effective in preventing transmission of threadworms to the foal, which occurs mainly via the mare's milk. Many other kinds of worms infect horses, and time does not permit me to cover them all. However, if you make an effort to control those worms listed above, you will have controlled 99% of the parasite problems in your horses.

Summary of Minimum Worm Control for Horses

Foals up to 1 year of age

Foals should be treated with drugs effective against ascarids at 2 month intervals beginning at 2 months of age. Depending upon the time of the year, treatments for cyathostomes (see adult horses below) should be included. In Florida, this would generally be in the last half of

a foal's first year of life assuming it was born on January 1 like all good thoroughbreds!
Treatment for *S. vulgaris* should begin after a foal is 6 months of age, again depending on climate and season of the year.

Mature horses

Treat horses at 2 month intervals with ivermectin, 3 month intervals with moxidectin, continuously with Strongid-C or monthly with other wormers beginning in September and continued through March. This will control large and small strongyles. Be sure to use ivermectin or moxidectin with the January treatment to control bots. Treat again for bots in late June. By again using ivermectin or moxidectin at this time, you can insure continued protection from *S. vulgaris* and cyathostomes acquired in late spring. Supplemental bot treatment may be needed in November if heavy bot activity was noticed in September or October. This program was designed for climates similar to that of Gainesville, Florida. A similar treatment schedule should be followed for other warm climate locations although the exact timing may vary by a month or so.

Where pleasure horses owned by many different people are stabled together, it is imperative that all be treated – one horse left untreated can contaminate the environment for all. Where this is not done, owners can treat their horses daily with Strongid-C which kills newly acquired worm larvae in the horse gut, thereby preventing infections from developing in spite of dangerously contaminated pastures.