



Small Strongyles: An Ongoing Battle

by HEATHER SMITH
THOMAS

A few decades ago, veterinarians estimated that about 90 percent of all colic cases in horses were caused by damage due to migration of large strongyle (bloodworm) larvae in the mesenteric arteries that supply the intestines with blood circulation. Now, however, many horsemen conscientiously deworm at regular intervals, and bloodworm damage is not as common—except on farms where worm populations have developed resistance to the drugs being used. Bloodworms can usually be controlled by changing to a different class of wormer, such as ivermectin.

But a worm that has held its own for a long time in the deworming battle is the small strongyle. All horses are infested to some degree with these tiny parasites, many of which have developed resistance to the commonly used dewormers. Worm populations constantly adapt and change—a parasite control program that worked a couple decades ago may not be very effective today, and the horse owner has to periodically change strategy.

The small strongyles are bloodsuckers that infest the large intestine, sometimes causing debility and anemia. They are smaller than bloodworms (large strongyles), less than a quarter inch long. There are several kinds of small strongyles, including *Trichonema* and *Triodontophorus*. There are more than 40 species of the latter. They don't migrate through tissues and arteries like bloodworms, but do their chief damage in the large intestine—mainly the cecum—ulcerating the mucous lining. In heavy infestations there may be little normal area left in the intestinal lining. The ulcers made by these small worms are deeper than those made by bloodworms and can occasionally cause fatal hemorrhage.

But it is the seasonal mass emergence of the small strongyle larvae from the intestinal wall that causes the most problems. This results in a clinical syndrome called larval cyathostomiasis, and most horses affected show a subtle decrease in performance and general unthriftiness. If a horse is heavily infested with these worms he may be slow in shedding the winter coat, and may have rapid weight loss, diarrhea, mild colic and severe enteritis (inflammation of the intestine), which can be fatal.

The presence of these immature worms can be hard to detect since they are not yet laying eggs that would show up in a fecal egg count. The larvae embedded in the gut wall are also beyond the reach of most deworming drugs. Once the larvae emerge from the gut wall, however, traditional dewormers can kill them.

SEASONAL EMERGENCE OF LARVAE

This seasonal emergence from the intestinal lining takes

place in late winter and early spring in northern parts of the country, and fall and winter in the south. The best control of these worms depends on timing a deworming program to coincide with certain stages of the parasites' life cycle, hitting them when they are most vulnerable. Most veterinarians recommend hitting the small strongyles diligently from April to August if you live in the north where winters are cold.

Ivermectin is effective if given in three treatments at eight-week intervals. This kills large strongyles at the same time, as well as many roundworms—and also kills any bot larvae still in the stomach that might have been missed in the previous fall deworming for bots.

Pyrantel pamoate, oxibendazole and dichlorvos are also effective against the small strongyle larvae after they have emerged from the gut lining, but these work best if given more frequently than ivermectin. Most veterinarians recommend five treatments with these drugs, given once every four weeks. For horses in the southern part of the U.S. it may be necessary to maintain this deworming schedule (every four to eight weeks, depending on the drug used) for a much longer period.

NEW DEWORMING DRUGS

The next generation of dewormers is now adding new weapons to the horseman's arsenal against parasites. Part of the avermectin family, moxidectin (available as gel paste) and doramectin (to be available as an injectable), are cousins to ivermectin. All three are structurally related compounds and kill internal parasites in the same manner—by paralyzing them (the worms cannot move or eat, so they eventually die).

Moxidectin seems to have some advantages over ivermectin in ability to control small strongyles when they are encysted cyathostomes in the gut lining. There is some evidence that it takes less treatments with this new drug to get rid of these tiny parasites. Joseph A. DiPietro DVM, MS, Professor of Veterinary Pathology and Dean of the College of Veterinary Medicine at the University of Florida, is a researcher who has taken part in many clinical trials of various deworming compounds. He says that "the major difference between moxidectin and ivermectin is in the efficacy against mucosal stages of cyathostomes and in ability to prolong strongyle egg suppression post treatment." This means that small strongyles may be adequately controlled with less treatments, and other parasites might be kept at bay with treatments as infrequently as every three months.

Moxidectin seems to be effective for control of late third and fourth stage small strongyle larvae, while ivermectin is effective against only the fourth stage larvae. Fenbendazole is the only dewormer that is recognized to be truly effective for early third stage larvae (the only stage that has the abili-

ty to go into arrested development—dormancy—and become encysted in the gut wall), but it must be given at twice the dosage rate used for regular deworming.

Craig Reinemeyer, DVM, PhD, University of Tennessee, has also participated in many drug trials for pharmaceutical companies, and says that moxidectin is not 100 percent effective against the encysted small strongyles, but is more effective than ivermectin. He also says that the “encysted cyathostomes are different from other parasites in that they are relatively unaffected by any of the standard dewormers.” Traditional deworming products could only kill these parasites after they emerge from the intestinal wall.

Moxidectin offers promise in providing more control against small strongyles, but may not be as efficient against bots as ivermectin. It does give the horse owner another good way to fight worms.

TOTAL MANAGEMENT PROGRAM

Weanlings and yearlings need more frequent and continual deworming because they are more adversely affected by the parasites. They have not yet developed much resistance to the worms. Horses develop immunity against some parasites, much like they do against bacteria and other invaders, though their defenses against worms generally inhibit the worms' damaging effects more than eliminating the worms themselves.

The invading worms release antigens, triggering the horse to produce a specific immune response. Later, when more of the same worms come along, the horse's immune system rec-

ognizes them and sets up a counter-attack, reducing the egg-laying capacity of the female worms and reducing the fertility of the males. Young horses eventually build a fairly good resistance to roundworms (ascarids) after exposure (this is why you rarely see an adult horse with heavy infestations of roundworms) but are not able to build as effective immunity against strongyles. The horse can still be heavily parasitized by these tiny robbers unless helped out with deworming and good management.

On farms where benzimidazole drugs (cambendazole, fenbendazole, mebendazole, oxfendazole and thiabendazole), febantel and phenothiazine have been used a lot, the large and small strongyles may have developed resistance. The horses may carry a heavy load of parasites in spite of regular deworming.

There can also be a problem if horses with resistant worms have been added to a herd. If a worm population has become resistant to one benzimidazole drug, it is also resistant to all the other drugs in that same class. If there is a chance that worm populations are resistant to these, it is wise to change to ivermectin, pyrantel pamoate, dichlorvos, oxibendazole, or the new avermectins that are now available.

Another strategy that can help turn the tables in the worming battle is reducing the worm eggs in pen and pasture. Usually only one to five percent of the actual worm population is inside the horses—the majority of the eggs and larvae are in the pasture. In small areas where horses are confined, cleaning up manure at least twice a week can greatly reduce the chances of reinfestation.