DEWORMER ADJUNCTS

Control Without— or Along With— Chemicals

PARASITE PRIMER—PART 10

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Our horses are lucky to live in an age when modern deworming drugs can pretty much rid them of parasites. They're living longer and healthier lives than ever before as a result of the easy availability of these drugs. But as we discussed last month, drug resistance is a looming problem, and questions still exist as to the most effective deworming program. Are there other things you could be doing, not instead of, but in addition to using anthelmintics, to help keep your horse's parasite load at a minimum?

Yes, there are several strategies you can implement to reduce the risk of parasite transmission in your own herd. Not all of them might be practical for your operation or circumstances, but at least some could have a place in your management routine.

To understand how these ancillary measures work, let's review the basic cycle of parasite infection, so we can identify the opportunities for intervention.

The Parasite Life Cycle Reviewed

1. Female parasites living inside the horse's gut lay eggs that are passed into the environment with manure.
2. Under conditions of favorable temperature and humidity, worm eggs hatch and develop into infective larvae.
3. Infective larvae survive in the environment for varying intervals, depending on climatic conditions.
4. Pastured horses swallow infective larvae as they graze.
5. Larvae mature within the horse, develop into reproductive adults, and the cycle starts again with the next worm generation.

ANNE EBERHARDT

One strategy for minimizing equine parasite loads on pastures is to allow non-equid species to graze the pasture for a while. Equine strongyle larvae are quite host-specific; they cannot infect cattle, sheep, goats, camellids (llamas or alpacas), or humans. When pasture contamination becomes dangerous for one bunch of residents, it's time to move them off into another area and bring in the substitutes, and the original parasites will die off because their hosts aren't around.

Let's examine some control options designed to interfere with various elements of this basic life cycle.

Fecal Contamination

Because each individual parasite began life as an egg in a manure pile, we could win the battle against equine parasites if it were feasible to keep horses from contaminating their environment with manure. How could we do that? Although carriage horses must be "diapered" in some urban areas, this isn't considered practical for horses in more usual habitats. But as a point of illustration, diapering would be a highly effective, non-chemical method of parasite control that would greatly reduce the risk of re-infection with most equine parasites (as long as you properly disposed of the manure).

In lieu of preventing primary fecal contamination, prompt and thorough removal of manure from the environment can be very beneficial. In a bygone era, the most elite stables employed pasture grooms, who followed grazing horses with a scoop shovel and a broom. Their job was to remove manure as quickly as it was dropped. But apart from it being very labor-intensive, this practice was probably not completely effective. After falling a distance of four or more vertical feet, some manure balls disintegrate on landing, so it isn't possible to recover every bit of manure nor the worm eggs contained therein.

In the 1980s, a similar approach was evaluated using updated technology. Studies at Newmarket in Great Britain examined the efficacy of cleaning horse pastures with a large commercial vacuum unit that was originally designed for golf course maintenance. Twice-weekly vacuuming was demonstrated to control pasture infectivity more effectively than routine deworming. However, the cost of the vacuum units was prohibitively expensive for the average horse owner, and the process only worked well on level pastures.

Even if one could afford to do it, the best intentions of removing manure at regular intervals can be totally confounded by a heavy rainfall. Precipitation in excess of one inch is the single most important agent for disseminating infective larvae away from a manure pile and onto forage.

Finally, because most stall habitats do not support the development of infective strongyle larvae, regular stall hygiene does little to reduce the risk of strongyle infection for confined horses. It's true, however, that stabled horses can acquire ascarids and pinworms when confined to an infected stall.

Larval Development

Eggs hatch and develop into infective larvae under conditions of moderate temperature and moisture. Cold slows the rate of development or stops it altogether, and excessive heat kills eggs and larvae. Could we capitalize on these weaknesses? Is it possible to heat manure sufficiently to kill the parasites contained therein?

Yes, it is, and it doesn't even require a fancy autoclave or a steam generator. Proper composting of manure and soiled bedding will generate relatively high internal temperatures, and strongyle larvae in manure are virtually eradicated by exposure to temperatures over 90°F for a minimum of two weeks. Composting is a practice that should already be in place at any stable. (For more on composting, please see "Living on the Edge" in our March 2004 issue, www.TheHorse.com/emag.aspx?id=5045.)

A composting corollary is that fresh or non-composted horse manure should never be spread on pastures. Spreading fresh manure can deposit as many potential worms as would result from weeks of grazing.

Larval Survival

Leaving pastures unoccupied for several months of the year might reduce the risk of infection, but remember the seasonal patterns we discussed in "Development and Persistence of Parasites" (in the July 2004 issue, www.TheHorse.com/emag.aspx?id=1523). Strongyle larvae can survive for only a few weeks during summer, but for as many as six to nine months during colder weather—and few horse owners can afford to leave a contaminated pasture ungrazed long enough for the worm larvae to die of attrition.

However, it might be possible to temporarily turn a grazing pasture into a hay field and recover the forage in a baled format. Or you might want to allow non-equid species to graze the pasture for a while. Equine strongyle larvae are quite host-specific; they cannot infect cattle, sheep, goats, camellids (llamas or alpacas), or humans. Given a herd or flock of "alternative livestock" that consumes about the same amount of pasture as your horses, effective parasite control could be achieved by routinely alternating the use of pastures between horses and other species. This is a complex solution, but one that could work extremely well if the species were rotated at intervals that were appropriate for the local climate, i.e., when pasture contamination becomes dangerous for one bunch of residents, it's time to move them off into another area and bring in the substitutes.

A deposit of horse manure in a pasture can serve as a protective reservoir for parasitic larvae if the manure dries gradually over a period of several weeks. Larvae within fecal masses can be evicted from this protected habitat and exposed to desiccation and ultraviolet light by "dragging" or chain-harrowing pastures to break up the manure. However, dragging should only be performed on unoccupied pastures, and only during hot weather. Horses can be put back on dragged pastures to graze within two to three weeks after dragging during summer conditions, but the risk of infection will not decrease until the following spring if pastures are dragged in autumn or winter.

Ingestion of Infective Larvae

Probably the single most effective recommendation for preventing parasitism in horses is to limit their pasture exposure. This is easy to say, but hard to do. Pasture is an important source of exercise and provides cheap nutrients for most horses, and pastured animals are far less labor-intensive than confined horses. Grazing muzzles can be used on some horses to minimize ingestion of forage while they are turned out—a good solution if you have easy keepers on lush pasture or any horse with a previous founder issue.

Although the parasite control impact of this management practice has not been formally evaluated, anything that reduces ingestion of forage and infective larvae should theoretically decrease the risk of transmission.

KIM AND KARI BAKER

One can reduce the level of parasite challenge in a horse pasture by removing manure at regular intervals, but this practice can be totally confounded by a heavy rainfall. Precipitation in excess of one inch is the single most important agent for disseminating infective larvae away from a manure pile and onto forage.

Customized Control Program

Previous articles in this series have explained that individual horses vary considerably in their susceptibility to parasitism, as evidenced by differences in the magnitude of fecal egg counts. If we were to monitor those fecal egg counts on a regular basis, we might be able to identify horses that are naturally more resistant to strongyle infection. These gifted animals could be dewormed less frequently than the typical hayburner, and the most intensive efforts could be reserved for horses that consistently have higher egg counts than the norm.

The differences in parasite susceptibility among individual horses are likely to have a genetic basis, as has been demonstrated unequivocally in ruminants. Certain breeds of hair sheep (the Barbados Black Belly, Florida Native, and St. Croix) are extremely resistant to parasitism, as are certain individuals within most of the classic meat or wool breeds. In fact, Merino rams with a high degree of genetic parasite resistance are highly prized in wool-producing countries because their first-generation offspring are 50% more resistant to worms than their dams. Admittedly, Thoroughbred Triple Crown aspirants are a long way from selecting sires and dams based on their genetic parasite-resistance properties, but nevertheless, it is entirely possible that one could breed a horse herd that had few parasitic problems and could remain healthy without the use of anthelmintics.

"Alternative" Dewormers

Various compounds, including chewing tobacco and garlic, have been purported to have activity against intestinal parasites of horses. In recent years, the most common subject of such claims has been a naturally occurring substance known as diatomaceous earth (DE). Diatomaceous earth is a whitish powder made up primarily of the exoskeletons of fossilized algae (diatoms). It's almost pure silicon dioxide, the same chemical formula as quartz, and its microscopic sharp edges make it useful as a filtering agent and an abrasive for industrial uses.

Theoretically, the abrasive nature of DE particles damages the integument (outer skin layer) of nematodes as they pass through a horse's gastrointestinal tract. Unfortunately, DE's reputation does not bear up under scrutiny. It has been the subject of only limited formal evaluation in sheep and horses (American Association of Veterinary Parasitology Proceedings), but those researchers failed to detect any anthelmintic effect associated with feeding DE, as measured by fecal egg count reduction in treated horses compared to untreated control animals.

One must also wonder about the effect of such an abrasive silica product on the horse's intestinal tract!

Along similar lines are the increasing number of so-called organic or herbal dewormers appearing in tack shops. To the best of our knowledge, the efficacy of these products has never been demonstrated in formal, controlled evaluations. These products exist primarily because they exploit differences in the labeling requirements for drugs vs. non-drug items. Before a drug can earn label claims for activity against parasites, this fact must be proven unequivocally to the Food and Drug Administration by extensive efficacy and safety testing. And once a dewormer is approved by the FDA, the claims that can be used in advertising that drug are regulated by the FDA.

Curiously, products that are not drugs per se do not require FDA approval for marketing, so advertisers of non-FDA approved products can say just about anything they want, and their products don't have to be effective. Caveat emptor, buyer beware.

Next month, we'll offer you some specific recommendations for controlling parasites in your young horses.

"NATURAL" DEWORMING OPTIONS?

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Pumpkin seeds have been used as an herbal remedy for treating parasite infections in horses because the seeds contain the amino acid cucurbitin, which many herbalists consider to be a natural anthelmintic. However, the efficacy of organic/herbal dewormers has never been demonstrated in formal, controlled studies.