

TOO MUCH DEWORMER CAUSING HORSE PARASITES RESISTANCE

Written by Lisa Kemp

Parasitology experts, alarmed by signs of parasite resistance in global equine populations, are now advising a more sustainable approach to deworming, including different strategies in pasture management, fecal testing, and dewormer selection. Deworming is still necessary, but understanding how parasite resistance develops, and the latest guidance on equine parasite management, can guide you in making safe and effective choices for your horse.

THE WORM DOCS

Equine parasitologists are finding that parasite resistance to anthelmintics, drugs that expel parasitic worms (helminths), has increased since the 1950s. They're sounding the alarm now because of the dearth of effective deworming drugs entering the marketplace, meaning we need to make sure what we have access to still works.

The parasitologists are also working to find solutions. Recent parasitology gatherings and conferences have focused on topics such as quantifying parasite resistance and developing sustainable practices. Eight video presentations from a March 2009 gathering at the University of Kentucky Gluck Equine Research Center have been recorded and archived at TheHorse.com, and together provide an overview of the issues and proposed solutions. Other informational resources are available online; simply do a search for 'equine parasite resistance' or related keywords.

The World Association for the Advancement of Veterinary Parasitology (WAAVP) [<http://www.meet-ics.com/waavp2009/pdf/V5WAAVP2009onsite.pdf>] conference, happening now (August 8-13) is titled 'Parasites in a Changing Landscape.' While the topic matter is broader than just equine, a quick scan of the scientific program shows that parasite resistance to anthelmintics, and managing and optimizing deworming protocols using fecal egg counts and sustainable practices, are hot topics in the industry.

IT'S ABOUT TIME

Parasite resistance didn't develop overnight, and our past deworming practices played a role. Since the 1980s, a variety of over-the-counter paste wormers

have made it easy to deworm horses according to the calendar. Squeeze, squirt, swallow -- another worm bites the dust. But that easy approach and sometimes prophylactic use of medication fostered an environment in which the parasites left behind are resistant to deworming medication, and they're the ones passing on genes to future generations of parasites.

One indicator of anthelmintic resistance is the time interval between deworming and the recurrence of parasite eggs in the feces, referred to as an egg reappearance period (ERP). A 2008 study showed a shortened lifespan and maturation cycle in small strongyles (cyathostomes) following ivermectin treatment; the parasites returned more quickly than when ivermectin was first commercially available. The concern is that lower ERPs might indicate a resistant parasite population.

Experts differ in their opinion of just what constitutes a resistant population, whether it's up to 25% of a population showing signs of resistance, or if it's any indication of resistance at all. What they do agree on is that it's irreversible.

LET'S TALK WORMS

"When ivermectin came out about 30 years ago, *Strongylus vulgaris* (large strongyle) was the parasite we were targeting most; it did a large amount of damage to both young and adult horses," says John Byrd, DVM, owner of Mahomet, Illinois-based Horsemen's Laboratory [www.horsemenslab.com] "Ivermectin killed adult *S. vulgaris*, but also 90% of the strongylus *vulgaris* larvae circulating through the horse. We never had a product that effective before," says Dr. Byrd. "Due to ivermectin, we rarely see *S. vulgaris* anymore, yet we're still deworming our horses as if it's the big problem it was."

Historically, large strongyles, also called bloodworms, were the origin of significant health issues in horse populations where they had gained a foothold. With larvae that migrate through a horse's organs as well as its intestinal tract and arterial system, *S. vulgaris* have caused thromboembolism, colic, and death.

As for other parasites, they cause varying amounts of harm. Small strongyles are pesky and can bring about diarrhea and weight loss, but they remain in the gut for their lifecycle and don't seem to

cause the more serious health issues their larger brethren do. Various species of tapeworms (typically *Anoplocephala magna* or *Anoplocephala perfoliata*), long thought not to affect horses since segments dissolve in the large intestine and aren't typically visible in manure, can contribute to a range of problems including ileal impaction or spasmodic (gas) colic.

Hoyt Cheramie, DVM, MS, DACVS, of Veterinary Professional Services at Merial Limited [www.merial.com], says that ascarids (*Parascaris equorum*), also referred to as roundworms, are a serious issue for foals, and it's the eggs that are infective. "After 10 days of being passed, ascarid eggs have infective larvae in them, and they can be picked up from almost any surface. Plus, they survive for an amazingly long time," says Dr. Cheramie. The ascarids travel through a foal's lungs, causing damage that can limit functionality and health. Fortunately, adult horses are generally resistant to ascarids.

Addressing parasites successfully has a proven, direct effect on the health of the horse; the question now is, what's the best methodology to prevent parasite resistance and maintain anthelmintic efficacy?

FINDING REFUGE IN REFUGIA

Enter the concept of refugia, essentially a way of keeping the parasite gene pool sensitive to anthelmintic drugs. If an entire parasite population is killed off, the only worms remaining are those that survived the dose, and are resistant to the medication. If all you have are resistant parasites, their stronger genes are going to be passed on.

However, if sensitive parasites escaped the deworming medication, then you have a better chance of maintaining anthelmintic sensitivity in your parasite population, allowing you to keep it from getting out of hand and harming your horses. "Until recently, if we found any eggs at all, we recommended deworming the horse. Following the Gluck symposium, we now advise the owner that it's better to leave a few strongyles behind, and try to explain why," says Dr. Byrd.

Maintaining refugia in your parasite population is like working with the worms rather than decimating them. Your best chance for success involves a combined methodology of:

- smart pasture management
- selective, customized use of dewormers
- ongoing assessment of parasite numbers (fecal egg counts)
- awareness of each horse's 'shedding' tendency

DON'T PUT ALL YOUR EGGS IN ONE Paddock

If you've not heard of 'shedding' before, it's an important concept in the new strategy for controlling worms. Although it's not clear why, some horses will simply shed more eggs in their manure than others, leading to more opportunities for re-infection for the entire herd.

By deworming high shedders more frequently, you'll minimize the numbers of eggs going into the environment. However, to compensate for that additional deworming and to promote refugia, you

should deworm low-shedding horses less frequently, sometimes as little as once or twice per year.

"We don't see horses that get dewormed less frequently dying from parasite infestations as we did with *S. vulgaris*. The parasites we typically deal with don't intend to kill their host, which would then limit their lifespan. It's not in the best interest of the parasite to damage the host," says Dr. Cheramie. He points out that understanding how parasites operate, and managing them to limit transmission and maintain refugia while preventing clinical disease, are the current strategies being embraced globally.

"One theory in humans is that a baseline level of parasitism helps to modulate the immune system, something that's been suggested due to the lower level of allergies and immune related diseases seen in

undeveloped countries than in the U.S.," says Dr. Cheramie. "Whether or not we can extrapolate that to the horse remains to be seen, but there's now some thinking that the goal of parasite control shouldn't be to have zero parasites, but instead to control and limit the transmission of parasites across equine populations as much as possible."

A NEW PARASITE PARADIGM

This new parasite control strategy means a little more work, and a bit more thought put into the how and the why of deworming practices. It's no longer total annihilation of parasites, but sustainable management of environment and practices. It's a recipe to protect the effectiveness of the deworming drugs we already have, so that we can continue to use them into the future.

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