

BY AMANDA DUCKWORTH

**WHILE NOT THE MOST** pleasant thought, horses are going to have worms. For decades it was standard procedure to administer dewormer to horses on a regular, rotational basis to combat parasites, but as science and the parasites themselves have changed, so too has the view of this practice in the veterinary community.

“There has been an overreliance on deworming too much, for too long,” said Dr. Martin Nielsen, Schlaikjer Professor of Equine Infectious Disease at the University of Kentucky’s Maxwell H. Gluck

Equine Research Center. “Too many have viewed deworming almost as just another form of vaccination. If people have an Excel file with their deworming schedule, it is usually in the same document as their vaccination schedule. I think that’s where it goes wrong from the get-go.

### Resistance becoming an issue to parasite control

“We are not supposed to prevent parasite infections. They are always going to be there. It’s not like vaccinating your horse. It is completely normal for horses

to have worms, and they very rarely cause any disease. There is a fundamental attitude that we are working on changing.”

The American Association of Equine Practitioners’ Parasite Control Guidelines addresses this change in practice in its mission statement, which states: “Commonly used strategies for parasite control in adult horses are based largely on knowledge and concepts that are more than 40 years old. However, much has changed over this time, necessitating a re-examination of recommendations for parasite control.”

The key differences between then and now are the fact parasites that were an issue in the past aren’t presently, and the parasites that are an issue are growing more and more resistant to available dewormers.

Specifically, *Strongylus vulgaris* and other large strongyles have become rare while cyathostomins, or small strongyles, and tapeworms have risen to prominence in adult horses. Of the three drug classes of dewormers used for horses—benzimidazoles (fenbendazole, oxi-bendazole); tetrahydropyrimidines (pyrantel); and macrocyclic lactones (ivermectin, moxidectin)—parasites have grown resistant to two of them and are growing resistant to the third.

The roundworm *Parascaris spp.* is resistant to ivermectin while cyathostomins are resistant to fenbendazole and pyrantel and are starting to show resistance to ivermectin and moxidectin.

“It is a global phenomenon, and it’s been found in many kinds of equine industries and different breeds,” said Nielsen. “Two out of three drug classes are not working anymore in a large majority of locations, so we often only have one left, and to that one, we are also beginning to see signs of emerging resistance. So, we are getting really close to the edge of that cliff.”



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Dr. Martin Nielsen of the Maxwell H. Gluck Equine Research Center



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There has not been a new drug class of dewormer on the equine market since 1981, and, according to Nielsen, it does not look like there will be a new one anytime soon.

“It gets crazier by the year,” he said. “I started my journey as a vet student about 20 years ago and did my first project on horse parasites, and we were saying the same things back then that we are saying now: There are no bulletins; there is nothing in the pipelines. If they have something going on, it is very secretive. We haven’t seen or heard anything from the big pharmaceutical players.”

The problem with resistance is two-fold. Once it happens, it is extremely unlikely that the drug will ever revert to working again, which means if a horse does have a parasitic issue, it may be left without a working treatment.

“Some have experienced an individual horse that had some kind of parasitic disease,” said Nielsen. “That can happen,



Rood & Riddle Equine Hospital's Dr. Lillian Haywood

scenario is that we easily could end up in a situation where we no longer have that.

“Once you have resistance, it’s not going away. Ever. My predecessor, Dr. Eugene Lyons, did a very interesting study. Back in the 1970s he had been deworming this group of horses, and he documented how the strongyles became

parasites later. It tells a lot about how once resistance develops there is no turning back.”

This recognition of the changing tides means that veterinarians today approach the idea of parasite control differently than they would have even a decade ago.

“I am a somewhat recent graduate, 2013, so, thankfully, our veterinary school lectures on deworming were already covering the resistance issue and the fact that rotational deworming schedules are no longer recommended,” said Dr. Lillian Haywood of Rood & Riddle Equine Hospital. “However, as a horse owner in the late ’90s and early 2000s, I do remember our veterinarian recommending blanket rotational deworming and even a daily deworming product containing pyrantel pamoate.”

Instead of rotational deworming, veterinarians are now endorsing fecal egg counts to help determine an individual adult horse’s needs as well as figure out which dewormers are still working in a given area.

“We now recommend performing fecal egg counts on adult horses and categorizing them into low, moderate, and high shedders based on their strongyle fecal egg counts,” said Haywood. “Moderate and high shedders are dewormed more frequently to prevent increasing the parasite contamination of our fields. Low shedders, which are most horses, only need to be dewormed once or twice a year with a product containing praziquantel in order to kill tapeworms, whose eggs often do not show up on fecal egg counts.

“Because of resistance, recommendations from farm to farm vary. Fecal egg count reduction tests are very useful—a fecal egg count is performed, the product is administered, and two weeks later the count is repeated. If the dewormer is still effective, you’ll see a 90-100% reduction in fecal egg counts. In cases where you don’t have that reduction, you know that dewormer is no longer effective on your farm, and you need to switch to another product.”

With science showing that former



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Of the three drug classes of dewormers used for horses, parasites have grown resistant to two of them and are growing resistant to the third

which is why we have dewormers, why we developed diagnostic tests, and why we issue guidelines for parasite control—to minimize the risk of that happening. However, when it happens, we want to make sure we have effective and safe treatments for the horses. The fear

resistant to the benzimidazoles. Then he left that herd of horses undewormed for 22 years. When he went back and tested again, the worms were still resistant. I think that tells the whole story, given this was so many generations of horses and certainly a lot more generations of



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# HEALTH ZONE

Deworming

protocols for deworming are no longer the best course of action for any given herd, veterinarians are finding their clients willing to adapt with the times.

"I do see quite a shift in attitude and approaches to parasite control," said Nielsen. "People are realizing that reliance on deworming every two months doesn't make any sense. The number one question I ask people, who are a little skeptical of fecal egg counts, is 'Tell me what you are doing now?' They then talk about the program they have used for many years, and I say, 'How do you know it works, if you don't do any testing?'"

"I am not telling you to change what you are doing, but I am urging you to check whether it actually works. That's where everything starts."

Nielsen has found that switching to a fecal egg count approach can be met with some resistance even by those who begin to deworm less, which comes down to the cumbersome nature of collection.

"Some people are willing to cut down on the deworming, but they are not willing to adopt more testing," he said. "Why is that? I think it is fairly simple. I think cutting down on treatment saves you cost; however, to adopt more testing comes with a cost. The cost is not just the dollars you pay per test but the time and effort you spend getting the samples. That's probably the



ANNE M. EBERHARDT

Foals and younger horses are more susceptible to parasitic issues

psychology that's at play there."

The practicalities of having to collect samples to do fecal egg counts are more complicated than a rotational deworming schedule, but veterinarians are working with clients to show its long-term value.

"The new recommendations do require some organization," said Haywood. "It is much easier for an operation to say, 'Every mare on the farm gets pyrantel June 1,' than it is to say, 'Mare X is a low shedder and gets dewormed twice a year, mare Y is a moderate shedder and gets dewormed three times a year, and mare Z is a high shedder and gets dewormed four times a year.' It can be a lot to keep track of, but the farms that seem to do the best with it have an organizational chart in the office with a list of each category of mares."

With an increased interest in fecal egg counts, there have also been efforts to modernize and improve testing.

"We are working to make egg counts easier and more streamlined," said Nielsen. "The fundamental method of the egg count is a 100-year-old technique, and it's nice to make an advancement into a more modern era. We have developed an automated egg counting system. That's something we worked on for six years."

"It is image-based, so a camera unit takes a picture of the sample, which has been stained so the eggs will stand out. It does the counting on the picture, and everything is completed in the matter of three minutes. We have validated it to be more accurate and precise than any manual counting method."

Another area of research for Nielsen and his team concerns a bacterial dewormer, and they recently submitted a grant to the United States Department of Agriculture to continue the work.

"One of the projects we are currently working on is a bacterial dewormer," he said. "This has some promise, especially against ascarid parasites, the large roundworms in the foals. We found in collaboration with a group at the University of Massachusetts that at least one or a couple of these proteins

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are potent against parasites. We are working on various ways of delivering that to the intestinal tract where the worms are. This would be a nice biological alternative to current dewormers.”

That could be especially impactful as foals and younger horses are more susceptible to parasitic issues and regular deworming is still recommended as part of their routine care.

“We still recommend rotational deworming for young horses as their immune systems aren’t yet fully developed,” said Haywood. “Roundworms are a serious concern in foals and short yearlings, but not in immunocompetent adults, and we are seeing a lot of resistance to our common products on



ANNE M. EBERHARDT

There has been an increase in interest in the use of fecal egg counts

many farms.”

Dewormers remain a valuable part of equine care, but as the science behind them changes, how and when they are utilized is shifting within the equine

community and seems likely to continue to do so. Like with other equine health issues, testing and working with veterinarians are important steps to achieving the best outcomes.

“I think that most of my clients understand the seriousness of the problem we are facing and have been very receptive to the new recommendations,” said Haywood. “Additionally, since the majority of broodmares are being dewormed less frequently than they were under the rotational deworming guidelines, doing

annual fecal egg counts actually saves clients money.” BH

Amanda Duckworth is a freelance writer based in Lexington.

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