Understanding that horses of different age groups can require different approaches for dewormer treatments is key to good management

Targeted Dewormers

TREATMENT PROGRAMS BASED ON HORSES' NEEDS HELP PREVENT RESISTANCE

By **AMANDA DUCKWORTH**

INTERNAL PARASITES ARE not a new issue when it comes to horse management, but ideas on how best to deal with worms continue to evolve.

Researchers have been cautioning for years that deworming on a rotational basis has led to widespread resistance to formerly effective treatments. Studies continue to prove this to be true. In 2019 the American Association of Equine Practitioners updated its parasite control guidelines for horses to reflect the results of research in this area.

When it comes to internal parasites, more than 150 species have the ability to infect horses. Of those, the AAEP cautions that small strongyles (cyathostomins), roundworms (ascarids), and tapeworms are the most common. They also are the most likely to cause trouble when it comes to a horse's health.

"Internal parasites, or worms, can be silent thieves and killers," explains the AAEP. "They can cause extensive internal damage without you even realizing your animals are heavily infected. The effects of internal parasites on a horse range from a dull hair coat and unthriftiness to colic and death. Internal parasites lower the horse's resistance to infection, rob the horse of valuable nutrients, and, in some cases, cause permanent damage to the internal organs.

"In terms of management priorities, establishing an effective parasite control program is probably second only to supplying the horse with clean, plentiful water and high-quality feed."

There are three drug classes of dewormer available for horses: benzimidazoles (fenbendazole, oxibendazole), tetrahydropyrimidines (pyrantel), and macrocyclic lactones (ivermectin, moxidectin). Unfortunately, parasitic resistance is a growing problem for all of them.

Traditional rotational practices involve horses' receiving doses of dewormer at multiple, recurring set points on the calendar. The push now is toward determining doses based on fecal egg counts. This approach determines an individual horse's needs and often leads to less frequent dosing. This method helps prevent resistance and provides evidence of which dewormers are working within the herd.

In October 2020, the *Equine Veterinary Journal* published "Monitoring equine ascarid and cyathostomin parasites: Evaluating health parameters under different treatment regimens." It noted the growing concerns about resistance.

"Strongylid and ascarid parasites are omnipresent in equine stud farms, and ever-increasing levels of anthelmintic resistance are challenging the industry with finding more sustainable and yet effective parasite control programs," explained researchers.

During this longitudinal randomized field trial, researchers evaluated egg count levels, body weight, and equine health under defined parasite control protocols in foals and mares at four stud farms; two Standardbred and two Thoroughbred.

In total, 192 horses were evaluated throughout the study. The 93 foals in the study were separated into two treatment groups while the 99 mares

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Following treatment protocols that prevent or reduce instances of resistance to available and approved parasite treatments is a worldwide concern

examined were put into one of three treatment groups. Data on the foals were collected every month for six months while the mares were evaluated bimonthly for 13 months.

For the purposes of the study, group A foals were dewormed at two months and five months with a fenbendazole/ivermectin/praziquantel product while group B foals were dewormed on a monthly basis, alternating between the group A treatment and an oxfendazole/pyrantel embonate product.

For the mares, group A was dewormed twice with fenbendazole/ivermectin/praziquantel; group B was dewormed with the same product, but only when egg counts exceeded 300 strongylid eggs per gram; and group C was dewormed every two months, alternating between the two products.

"There were no significant body weight differences between foal groups, but (group A) mares were significantly lighter than the other two (mare) groups," researchers concluded. "Very few health incidents were recorded. (Group A foals) had significantly higher ascarid and strongylid egg counts, whereas no significant differences were observed among mare groups. Anthelmintic treatment intensity was lowered from the

traditional intensive regimes without measurable negative health consequences for mares and foals."

As this study shows—and as the AAEP recommends—less can be more in the case of parasite control. Additionally, horses of different ages have different needs when it comes to dewormer.

Understanding that different age groups can require different approaches is key to good management. A deworming plan that works for an adult horse is not designed to work for a foal. In April 2019, *Veterinary Parasitology* published "Anthelmintic efficacy of single active and combination products against commonly occurring parasites in foals."

The ever-growing anthelmintic resistance to dewormers is a major concern

"Parasite control in foals is complicated by the concurrent presence of biologically diverse parasites with differing levels of anthelmintic resistance," explained researchers. "Several combination anthelmintic products are available for use in horses, but information on their efficacies against important equine parasites is scarce."

During this study, two trials took place in New Zealand, in 2008 and 2011, on four farms with different parasite treatment histories. The first trial involved 49 foals on three different farms and aimed to evaluate the efficacy of an ivermectin/praziquantel/oxibendazole combination, a single active oxibendazole, and a single-active macrocyclic lactone. The second took place on three different farms and looked at 110 foals. It involved two combination anthelmintic products, three single-active macrocyclic lactone products, and a placebo group.

In both cases, the foals were monitored monthly prior to treatment and fecal egg counts were determined. Researchers used a "rolling enrollment" process to systematically allocate foals to a treatment group following the first appearance of *Parascaris spp.* eggs in the feces.

The researchers found that across both trials, treatment with macrocyclic lactone single active products failed to achieve a 95% or greater reduction in *Parascaris spp.* on two of three farms, while the pyrantel embonate/oxfendazole and ivermectin/ praziquantel/oxibendazole combinations demonstrated full efficacy against *Parascaris spp.*

"This is in contrast to the anti-strongylid efficacies determined," the study noted, "where the pyrantel embonate/oxfendazole combination and single active oxibendazole had reduced efficacy on one farm while the macrocyclic lactones generally had good efficacy.

"Strongyloides egg counts were sporadic in both trials and allowed limited insight into anthelmintic efficacy. The study illustrated the importance of keeping an untreated or placebo-treated control group in studies evaluating anti-Parascaris efficacy and it demonstrated the utility of a rolling enrollment procedure, where foals are enrolled over the course of a defined period of time. Furthermore, the study demonstrated the value of a farm specific monitoring program and the complexity of parasite control in foals, where combination anthelmintic products can be employed to target multiple species of parasites."

Changing perceptions about deworming programs is an ongoing effort. In October 2021, *Veterinary Parasitology* published "Three-year study to evaluate an anthelmintic treatment regi-

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men with reduced treatment frequency in horses on two study sites in Belgium."

Prior to the study, horses on both properties were treated up to six times a year with ivermectin or up to four times a year with moxidectin. For the study, all of the horses were treated with ivermectin or moxidectin in the spring and in the fall.

"Fecal egg counts were conducted every two weeks during the summer pasture season. Whenever the individual (count) exceeded 250 eggs per gram of feces, the specific horse was treated with pyrantel embonate," explained the researchers. "No increase in parasitic disease over the three-year period of the study was observed."

Taking it a step further, the researchers then imported the fecal egg count data collected in the study, as well as the age of the horses and the local weather data, into a cyathostomin life-cycle model in order to evaluate long-term effects of the newly applied treatment regimen.

"The model simulations indicated that the whole-herd treatment regimen with at least four macrocyclic lactone treatments annually led to signifcantly faster resistance development than any of the alternative treatment regimens evaluated under the specific conditions of these two study sites," researchers concluded. "Further lowering the treatment frequency or applying even more selective treatments enhanced the delay in resistance development, but to a lesser extent."

Delaying resistance to available and approved parasite treatments is a worldwide concern. In July 2020, the *Equine Veterinary Journal* published "A questionnaire study of parasite control in Thoroughbred and Standardbred horses in Australia," while *Parasitology* published "Questionnaire survey on helminth control practices in horse farms in Ireland" in June 2019, and "A survey on parasite control in sport horses of Argentina and other regional countries" was published in August 2018 by *Veterinary Parasitology*, Regional Studies and Reports.

In Australia the study was designed to identify parasite control practices currently used on horse stud farms and investigate the frequency of use of management factors that have been associated with the likelihood of promoting or delaying anthelmintic resistance. The questionnaire was sent to 300 stud farms, and it received a 25% response rate.

"Macrocyclic lactones were the most commonly administered anthelmintics in mares and foals and less than 5% of respondents used targeted treatment

Deworming plans that work for adult horses are not designed to work for foals

regimens," researchers concluded. "The implementation of pasture hygiene practices was variable. The majority of respondents (97%) considered anthelmintic resistance to be important; however, few respondents were aware of the use of fecal egg count reduction tests for monitoring of drug efficacy.

"Parasite control strategies on Australian stud farms remain over-reliant on anthelmintic use. The frequent use of macrocyclic lactones is of concern for the increased selection pressure for anthelmintic resistance. There is a lack of awareness of the importance of non-chemotherapeutic strategies in integrated approaches to parasite control aimed at delaying the development of anthelmintic resistance. This study highlights the need for greater veterinary involvement in the implementation of more sustainable parasite control practices with greater emphasis placed on surveillance through fecal egg count testing."

In the Irish study, researchers concluded that more education on how best to combat internal parasites is needed.

"Knowledge regarding helminth control strategies and nematode infection of horses in Ireland is limited and only one study has been published recently," explained researchers.

> **"STRATEGIES FOR PARASITE CONTROL HAVE UNDERGONE MAJOR CHANGES IN RECENT YEARS ..."**
>
> —RESEARCHERS IN A STUDY PUBLISHED IN *VETERINARY PARASITOLOGY*

More than 700 questionnaires were sent out to members of the Irish Thoroughbred Breeders Association and Horse Sport Ireland inquiring about general grazing, pasture management, and deworming strategies including the use of fecal egg counts. Only 78 were completed.

"The majority of farms (81%) treated horses four or five times per year and 74% estimated the weight of the horses visually," researchers concluded. "The findings of this study illustrates that many stud managers/owners do not follow best practices with regard to helminth control and more education is needed."

In Argentina, 100 surveys were sent out, and researchers received 69 responses. Veterinarians answered 53% of the returned surveys while 47% were handled by managers. The majority of responders—81%—worked with Thoroughbreds.

"Strategies for parasite control have undergone major changes in recent years, especially in Europe and the United States, replacing traditional approaches by schemes based on surveillance and selective therapy," explained researchers. "A first step in helminth control planning is to understand and demonstrate how horse owners or trainers currently control nematodes."

In this study most respondents (48%) treated horses at a fixed time every three months; 22% at a fixed time every six months, and 16% at a fixed time every four months. When asked about the timing of such treatments, 41% said they did so based on the time elapsed since the previous treatment, 22% on time of year, 15% based on the age of the animal, and 12% according to previous diagnosis.

When it came to answering questions about the newer deworming guidelines being adopted in other parts of the world, the numbers were not encouraging.

"Regarding making a diagnosis prior to treatment, 76% of the respondents answered negatively while 24% did so," researchers concluded. "Only 20% of respondents performed the anthelmintic efficacy test. It can be concluded that there is little participation and planning of the veterinary professional regarding the control of internal parasites in horses of Argentina. Performing coprologic (fecal egg count) tests are practices not usual in our region. Practices of parasite management seem to be reduced almost exclusively to the administration of anthelmintic drugs at fixed times, often indiscriminately."

The ever-growing anthelmintic resistance to dewormers affects Thoroughbreds all over the world. Continuing education and research is an important part of updating best practices when it comes to equine management in order for horse health to flourish. BH

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