



Squelching Drug Resistance in Parasites

by: Marie Rosenthal, MS • June 01 2011 • Article # 19009

Intensive use of anthelmintics has fueled parasite resistance to these drugs; here's how to deworm intelligently to combat this resistance.

With the growing number of parasite populations resistant to anthelmintics, today's parasite control programs require more thought and planning than simply deworming all horses in a herd every other month. Fecal egg count testing, selective deworming, and environmental controls can help you create an individualized--and effective--program for your farm and your horses.

Putting this type of deworming program in place takes some upfront effort and cost, but it can save horse owners money in the long run, and more important, it might help delay the emergence of parasites that are resistant to the available anthelmintics.

"Most common equine parasites are resistant to at least one class of dewormer," says Craig R. Reinemeyer, DVM, PhD, president of East Tennessee Clinical Research Inc., in Rockwood, Tenn. "And it has to do with how intensely various products have been used. We need to deworm less, and we need to deworm more intelligently."

For a long time horse owners and farm managers thought the best way to control parasites was with drugs, drugs, and more drugs, but many parasites have consequently developed resistance to the dewormers we use, explains Ray M. Kaplan, DVM, PhD, Dipl. EVPC, professor of parasitology at the University of Georgia College of Veterinary Medicine in Athens. "The more often you deworm, the more drug resistance you will have," he says.

Gathering Evidence

The first step in designing an effective deworming program is to determine which drugs work within a herd. "We need to get away from the calendar method that says, 'It is January; I am using this

product, and in another eight weeks I will be using that product,'" says Mary G. Rossano, PhD, assistant professor of equine epidemiology and parasitology at the University of Kentucky College of Agriculture. "Instead, we need to use a method that is more evidenced-based. We need to get fecal egg count test results and follow up to see how effective the drugs are on the parasites."

Horses shed worm eggs or larvae in their manure, introducing parasites into the environment that are then picked up by horses while grazing. A parasite control program should take this cycle into consideration. To plan deworming treatments, an owner needs to know how long a drug suppresses egg production, which is why the first step in deworming is fecal egg count reduction testing. A fecal egg count exam is a simple, inexpensive test to estimate farms' and horses' worm burdens by measuring the number of parasite eggs present per gram in each horse's manure.

"Remember the 20-80 rule," says Kaplan. "About 20% of the horses have about 80% of the parasites." To determine which horses fall within this 20%, run fecal egg counts on all animals. Then work with your veterinarian and base treatment frequency on the fecal egg count results. Horses that are low or moderate shedders (<200 to 500 eggs/gram) only require deworming once or twice a year. High shedders (>500 eggs/gram) could be dewormed more often.

Treat the high shedders with an appropriate class of dewormer as recommended by your veterinarian, and then run another fecal egg count two weeks later to see if that product is effective. If the egg counts don't decrease by at least 80%, then the parasites on your farm are resistant to that dewormer and you need to try a different product. If the egg counts do decrease, wait a bit and test again so you know how long between treatments it takes for the egg counts to rise; this is called the "egg reappearance period." Once egg counts start to increase, you should re-treat the high shedders.

Low and medium shedders should still be treated once or twice a year to help control large strongyles, bots, and tapeworms. "My current thoughts are that all horses probably could use two (deworming) treatments a year at six-month intervals," Reinemeyer says. "I use what I call the equinox schedule--autumn and spring. If one uses a product that is larvicidal for large strongyles, it will eradicate these dangerous worms from your herd."

In addition, there is no need to deworm even high shedders during certain seasons when there is no threat. In northern climates where it freezes in the winter, for example, there is little need to deworm any horse during that time of year. In southern regions, on the other hand, where summers are too hot and occasionally too dry for worms to thrive, there is little need to deworm in the summer.

"In a very cold climate, moderate temperature climate, or the Deep South, the timing of deworming will be different," says Kaplan. "It doesn't make much sense to deworm your horse in January if you live in New Jersey any more than it makes sense to get out your lawn mower and start mowing your lawn."

"Think of worm control as a yearly cycle that starts when the weather changes to make parasite transmission more likely," Kaplan continues. "Therefore, in the North you want to start your cycle in the spring just before it starts to warm up. In the South we consider the cycle to start in early fall."

One traditional method that veterinarians have discovered is not as effective as once thought is rotational deworming, in which drug classes are alternated with each treatment. "I don't recommend rotation programs at all," says Kaplan. "It makes no sense to rotate from a drug that works to a drug that doesn't work. For a number of reasons a blind rotation will not achieve the efficacy that is desired. You want to use drugs that are effective and use them at appropriate times of year to kill the various species of parasites that need to be killed."

Tradition is sacred in horsemanship, and changing the way things are done, especially if it costs more, is difficult, admits Reinemeyer and Rossano.

"Change is hard and the drugs are cheap enough that it can be difficult to justify the cost of testing up front to see where you stand. But down the line, as you decrease the frequency of deworming it starts to pay you back," Rossano adds.

"We are not saying don't take care of your horse, we are saying deworm your horse if he needs it, and use the drug that is most appropriate for the parasite you are trying to control," she adds. For more information on dewormer classes and efficacy, download a Deworming Fact Sheet at TheHorse.com/Free-Reports/view.aspx?id=45.

Grandpa's Farm Manual

An important part of any parasite control program is managing the environment that affects the farm's worm burden.

"We need to go back and do some of the things our grandparents used to do and use a common sense and holistic approach to deworming, which considers the environment," Kaplan says.

If they have enough room, horses will segregate their pasture into lawns (uncontaminated areas) and roughs (areas containing piles of manure)--defecating in certain spaces and grazing in others. They naturally avoid the roughs that house the majority of the pasture's parasite burden. To maintain this natural practice, don't overstock pastures and crowd horses onto a small area of land.

"There is a huge difference in the amount of manure in different areas of a pasture," says Kaplan. "If the horse has enough pasture, he will avoid grazing where he defecates. If they are overstocked, and there is not enough pasture, he will be forced to graze closer to the manure and he will acquire more parasites. Pasture management is a very important piece of the parasite control puzzle."

"You can do a lot with a broom and a scoop shovel or a pasture vacuum if you can afford it," says Reinemeyer. "Picking up the manure would probably control parasitism more effectively than using dewormers."

Manure that is gathered from pastures and stalls should be placed in an active compost pile. "Composting manure is very helpful. The heat that comes from composting is lethal to strongyle larvae and ascarid eggs," says Rossano. "A true active compost pile (that is, one maintained with turning, not just piled behind the barn) gets steaming hot. By the time the compost is ready to be applied to pastures or gardens, the parasites are dead."

"If you are doing strategic deworming that targets the high shedders and cleaning up the manure and composting it you can bring down the larval contamination of your pasture very effectively," she concludes.

A Few Worms Can't Hurt

Contrary to some people's beliefs, horses that are dewormed less frequently are not at higher risk for disease, according to veterinarians. Horses have evolved with parasites, and small worm burdens will not hurt them. "If you feed a decent diet and maintain a reasonable stocking rate, you're not going to have horses dropping dead from parasites," Reinemeyer says. "If you have parasitic disease in a population of horses, you don't have a worm problem--you have a management problem. Either you have too many horses on too few acres, their diet is poor, or they are experiencing excessive stress."

Take-Home Message

Parasite resistance to anthelmintics clearly is a growing problem on horse farms. Kaplan's best advice to prevent resistance from developing on your farm is to test a dewormer, determine that it's effective, and limit its use. Give horses the baseline treatment as needed, one or two treatments a year to all the horses, and only treat the high-shedding horses frequently.

"We need to view the horse as an individual and then consider the climate, the environment, and the epidemiologic cycle of transmission to reduce the exposure of the horses to the parasites," Kaplan says. Remember, however, that parasites are controlled at the population (i.e., herd) level; individual treatments must be part of a coordinated effort to be effective.

Seek the advice of a qualified veterinarian before proceeding with any diagnosis, treatment, or therapy.

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