Deworming Strategies

Treat cattle at the optimum time.

by ***Heather Smith Thomas***

Grazing cattle pick up internal parasites called nematodes, or stomach and intestinal worms. These tiny opportunists depend on their host to complete their life cycle. They evolved with cattle, and all cattle carry some of these parasites. These worms rob cattle of important nutrients, reduce growth rate and weight gains in young animals and hinder production in cattle of all ages.

Heavy parasitic infections create health problems. Clinical disease caused by gastrointestinal (GI) nematodes is referred to as parasitic gastroenteritis. Symptoms include weight loss, diarrhea, edema beneath the jaw and anemia. Worms add stress to their host and make cattle more susceptible to disease.

Calves are most susceptible

Age and immunity both affect the parasitic pressure cattle face. Most cows have fewer parasites as they get older, due to immunity they develop to some of these worms.

Ray M. Kaplan, DVM, Ph.D., DACVM, DEVPC, pathobiology professor with the School of Medicine at St. George's University in Grenada, has studied parasites for years. He notes healthy, mature cows in good condition cannot only withstand GI nematodes effects but also build a fairly strong immunity against them.

"In this class of cattle, when otherwise healthy, clinical disease from GI parasites will almost never be seen," he says. "On the other hand, young, recently weaned calves in their first year on grass are highly susceptible to parasitism. The potential for high fecal egg counts makes this group of animals at greatest risk for production loss and clinical disease," he says.

Calves are vulnerable to damaging effects, since they haven't developed much immunity to worms, and they tend to have heavy parasite loads. This is especially true for Cooperia, a type of roundworm, which can have a significant impact on young cattle.

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>
> **— Thomas Craig, DVM, Ph.D., Texas A&M**

Deworming Feedlot Calves

Cattle are usually dewormed within a few days after arrival at a feedlot. One treatment is usually all that's needed since they have minimal exposure to worms in the feedlot environment. Studies during the 1960s and 1970s showed that unexposed or uninfected calves gained weight more rapidly than infected or infected-and-medicated calves. The same research demonstrated that infected-and-medicated calves (dewormed at feedlot entrance) gained 4% faster than their untreated counterparts. So, it became standard practice to deworm incoming calves.

Later studies showed that of all the pharmaceutical technologies, deworming had the greatest effect on production efficiency and cost of production. It was well known that cattle perform better in the feedlot after being treated for internal parasites, but there were very few reports looking at how parasite load at feedlot entrance might impact performance, carcass characteristics and subsequent health in the feedlot.

However, an Iowa State University (ISU) study suggests cow-calf producers who retain ownership through the feedlot could benefit from deworming the calves during the grazing period, before sending them to the feedlot. Likewise, producers who routinely sell to repeat customers may find that dewormed calves are desired by the cattle feeder who benefits from lower treatment costs and higher grading carcasses.

The study looked at 36 southeastern calves that were individually assessed for fecal egg counts (from fecal samples) upon arrival at the feedlot. The calves were divided into "High" and "Low" groups based on initial fecal egg counts, which varied significantly from 0 to 463 eggs per gram of feces. Calves in the "High" group had fecal egg counts of more than 100 per gram of feces; the "Low" group had less than 100.

All calves were dewormed after initial evaluation, implanted, fed in a single pen, and harvested after 179 days on feed when the average 12th rib fat cover was estimated to be about 1.15 centimeters. Final weight was measured individually before shipment to the harvest facility. After harvest, hot carcass weight and carcass characteristics (quality grade, marbling, fat thickness, etc.) were measured and recorded by USDA personnel.

The "High" group tended to have lower weight gain than the "Low" group. More "High" calves were treated for illness and received more frequent re-treatment than the "Low" group. The treatment costs were four times higher for calves with "High" initial fecal egg counts than the "Low" calves.

A small study in 1969 stated parasites had their greatest influence on performance in the early part of the feeding period and that infected groups experienced enough compensatory gain to catch up later. No such compensatory gain was evident in the ISU study. Compared with the "Low" group, the "High" group tended to have reduced average daily gain (ADG) during the first 24 days on feed, but the overall ADG between groups did not differ much. Thus, with no compensatory gain, the "High" cattle were unable to make up for their poor start.

Back fat and marbling scores were lower for the "High" calves than the "Low" calves. The tendency for less back fat, ultrasound loin muscle (LM) area and marbling scores support the idea that cattle with heavy parasite loads at feedlot entrance may take longer to reach market-ready carcass composition. The trend for a lesser LM area among the "High" group suggests a lesser amount of muscle production. It is possible that reduced feed intake at critical points during the grazing period hindered overall muscle production in the highly parasitized calves.

Overall, the "High" cattle brought less total income per steer than did the "Low" group. Increased marbling scores often translate to higher quality grades and higher carcass values when sold on a grid.

Many producers have believed that deworming upon feedlot arrival effectively rids cattle of parasites and reverses the detrimental effects of high worm burdens during the earlier grazing period (on their dams and/or as stockers). Data from this study suggests that detrimental effects on growth and performance from parasite burdens when the cattle were younger may be long-lasting, despite effective deworming at feedlot arrival. **BA**

"Cows usually have very good immunity to Cooperia and are predominantly infected with Ostertagia, whereas calves are infected with both Cooperia and Ostertagia," Kaplan says.

Since mature cows are more susceptible to Ostertagia than Cooperia, this parasite has more clinical significance in adult cattle.

"I think Ostertagia (brown stomach worm) is the most important parasite in cattle in most of North America," says Thomas Craig, DVM, Ph.D., professor emeritus, Department of Veterinary Pathobiology at Texas A&M. "It's the only one very important in adult cattle (because it continues to do well in the host even as the animal gets older) and can be devastating to young animals, as well. Most of the other internal parasites in cattle are not an issue in adults. By the time cows are 2 years old, they have developed some resistance to most worms and have low numbers. When a cow is 4 or 5, she's either developed enough immunity to keep parasites at a reasonable level, or she's been removed from the herd because she's not doing well."

At the same time, nematodes are building increased resistance to the products used to defend against them; worms are becoming harder to kill. There is now widespread resistance in Cooperia to ivermectin and moxidectin. In some situations, producers will have the best success using one type of dewormer for cows and a different product for the calves, which will kill Cooperia. Producers should discuss potential solutions to growing parasitic resistance to dewormers with their veterinarian. For example, not treating cows with dewormer will not affect the resistance levels in Cooperia but could help slow the development of resistance in Ostertagia, which is of growing concern.

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One way to know if a dewormer is working is to take fecal samples when cattle are treated, and another sample 14 days later, to see if egg counts have dropped (see Handle on Health, Page 70).

Perfect timing

Deworming cattle at the proper times helps reduce the parasitic load and the risk of reinfection. It's important to plan deworming treatments to interrupt the life cycle of the targeted parasite. Timing the deworming treatment correctly during the nematode's life cycle eliminates egg-laying adults and minimizes re-contamination of the pasture with worm eggs.

Most producers deworm in spring and fall, but actual timing should match the parasite's life cycle, which varies depending on climate, according to Craig.

"Here in Texas, winter is when the worms are thriving on pastures because it's cool and moist but not too cold, whereas in northern parts of the U.S. the worms can't survive outside the cow so they go dormant in the GI tract during winter and aren't laying very many eggs," he says. "Summer is the best time here to deworm — when it's dry and hot. In the north, by contrast, winter is a good time to deworm."

You can slow down transmission of worms (and future contamination of pastures) if you hit them when they are dormant, killing any that would otherwise "wake up" to start laying eggs when weather improves. Ostertagia goes into dormant stage, embedded in the abomasum wall, when environmental conditions are poor for larval survival in pastures. Dormant worms emerge later — to mature and lay eggs — when conditions improve. If you deworm in late fall or winter when these worms are in the stomach wall, using a drug that can get to them in that location, you reduce future worm problems on spring pastures.

Research has shown that it probably pays to deworm calves after they are older than 2 months of age. Even though they may be doing well because they are nursing their dams and on good feed, they generally have a few worms. "Most studies indicate that if we treat calves above 200 pounds or 2 months of age, they gain more by weaning time than untreated calves, even though the untreated animals may not show clinical signs of worms. It made a difference that would more than pay for the drug," Craig says

Deworming calves at least a couple weeks before their fall vaccination also enables them to mount a better immune response to vaccinations. If a rancher is working cattle when calves are 2 to 3 months old, it's generally a good practice to deworm them, especially if they summer on irrigated pastures rather than dry rangeland.

Stockers and replacement heifers are at greatest risk for production loss from parasites, according to Kaplan. Use of anthelmintics will be important to their health and production. "However, optimal strategies for applying anthelmintic treatments will vary greatly, depending on the management and grazing system. Thus, it is impossible to provide a general recommendation," he says.

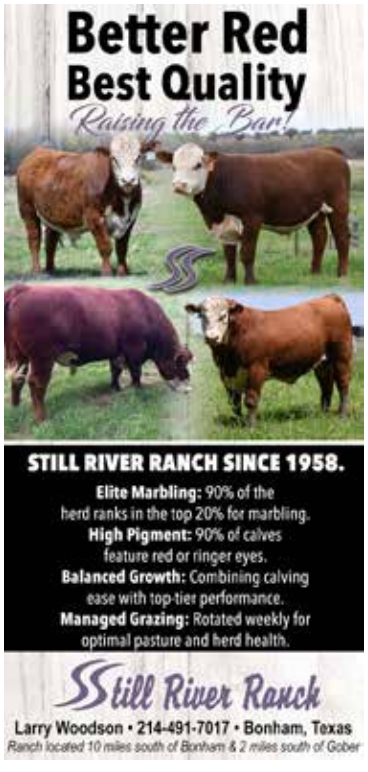
Keeping pastures clear

The worm load in a group of cattle depends partly on how heavily contaminated the pasture is, because hatching larvae migrate onto grass the cattle eat. The environment can also affect the number of parasites.

It may make a difference whether or not the pasture is used as hay first, before being grazed, since this gives a longer time interval and cutting mature grass leaves a shorter stubble, opening the remaining plant to heat and drying. The worms won't survive as long on pasture in hot weather, unless they are protected by a fecal pat.

Cattle on rangeland, for example, won't pick up many worms because conditions are drier (inhibiting worm transmission) and the stocking rate is low; the animals have less opportunity to be exposed to worms. By contrast, cattle in lush green pastures face higher numbers of worms since the larvae thrive in wet conditions and cattle density is usually higher. If a pasture is used season-long for grazing in a rotational system, everything tips in favor of the worms.

"Intensive grazing on irrigated pastures creates ideal situations for worm transmission. Many short duration, high-density grazing systems are modeled on how long it takes to get high-quality forage regrown again so the animals can come back to it. The time interval for that is often the same time it takes worms to develop — for the eggs to hatch and become infective again," Craig says.

While cattle density and timing make transmission conditions ideal in some intensively grazed pastures, with more worm eggs in a smaller area, he notes that the quality forage and nutrition these systems provide offset a few more worms before the parasite load begins to take its toll.

If calves are grazing pastures heavily contaminated with worms, they may develop large worm burdens. "The young calf may not pick up worms as readily as an older calf. If you have a lot of older calves running together on a pasture, shedding worm eggs, this can be a recipe for problems," Craig says. **BA**