

Internal Parasite Control in Louisiana Beef Cattle



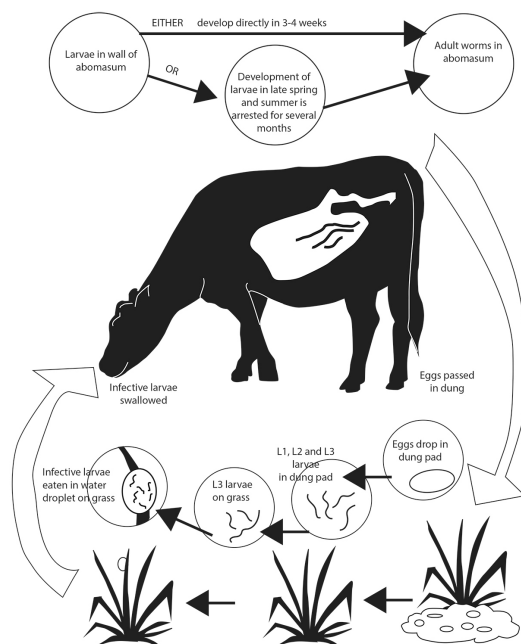
Christine B. Navarre, DVM

Introduction

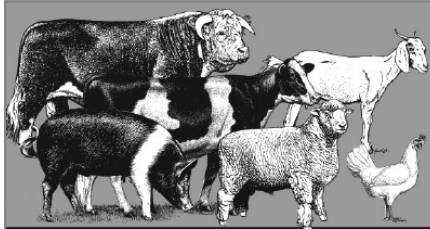
Controlling internal parasites in grazing cattle is important for cattle health and welfare and can have a significant positive return on investment. However, there is increasing concern about resistance of cattle parasites to dewormers (anthelmintic resistance or AR) and the ability of cattlemen to continue to have cost-effective parasite control. Anthelmintic resistance is a very complex and serious issue and the extent of AR varies from ranch to ranch. Cattlemen need a basic understanding of parasite biology and control measures so they can work with their veterinarian to develop parasite control programs that balance the short-term economic benefits of deworming with the long-term impact of anthelmintic use on resistance.

Parasitology Basics

Adult parasites live in the gastrointestinal tract of cattle and lay eggs that are shed in manure. These eggs hatch and develop into infective larvae. These larvae crawl onto the grass and are ingested when cattle graze. The larvae then develop into adults in the gastrointestinal tract and lay more eggs.



Many factors, including rainfall, environmental temperatures, pasture type, grazing management, age and immune status of animals, previous product use and anthelmintic resistance patterns all determine the severity of parasite problems on an individual ranch in a given year. A unique parasite control program must be developed for each ranch. The parasite load in the animal and on the pasture must both be considered.



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Ostertagia ostertagi is an important cattle parasite in Louisiana. It can impact both young and mature animals. *Ostertagia* likes cool weather, and infective larvae do not survive well in the heat of Louisiana summers.

Cooperia spp. and *Haemonchus placei* are common parasites of calves. They are warm-season parasites, so large numbers build up in summer months. Cattle usually develop immunity to these parasites by the time they are yearlings, but adult cattle will continue to have low numbers that will contaminate pastures for calves.

Anthelmintic Resistance

Anthelmintic resistance is an inevitable consequence of the use of anthelmintics over time. Resistant parasites have genes that protect them from the effects of anthelmintics. The parasites may be resistant to one or multiple products at the same time. Ranches can also acquire anthelmintic-resistant parasites with herd additions.

Anthelmintic resistance is usually suspected when a deworming fails to give the expected production responses. But poor performance or clinical signs of parasitism that don't improve following deworming should not immediately be interpreted as a failure of the product. Other factors to check include:

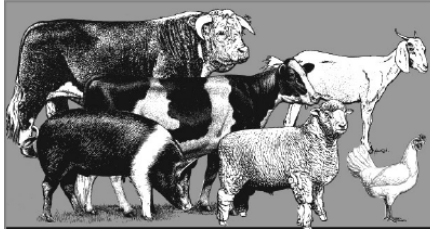
- Proper product storage
- Proper product administration including dose and route

Parasite Control: A Balancing Act

One of the key concepts in slowing down the development of resistance is the maintenance of susceptible parasites in **refugia**. Parasites in refugia are those that are not exposed to the dewormer when the animals are treated. They include the parasites in animals that are not treated (because the cattleman purposefully or accidentally did not treat them) as well as the infective stages on pasture. If we can maintain a large proportion of susceptible parasites in refugia, we can dilute the resistance genes in a population and maintain the effectiveness of the anthelmintics.

When an entire group of cattle is dewormed, we eliminate the susceptible parasites in the animals. The only parasites that survive in the animal following deworming are the few that are resistant. The eggs that result from the mating of these resistant parasites are passed out on pasture and develop into infective larvae. Initially there are enough susceptible larvae on pasture that the cattle ingest a mixture of resistant and susceptible larvae. However, with deworming of all the animals regularly over time, the susceptible parasites are eliminated and the resistant parasites and their larval offspring on pasture are the only ones left. Eventually, there is failure of the dewormer to work as expected.

The overall level of infective larval contamination of pasture is influenced by pasture management practices and environmental pressures. These influences will impact larvae from both resistant and susceptible parasites.



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Examples of differing levels of pasture contamination:

- Permanent pastures
 - Likely contaminated with parasite eggs and larva
 - Pastures used continuously for grazing
 - Overseeded pastures that have recently been grazed
- Non-permanent pastures
 - Tilled and planted between grazing periods (ex. wheat pasture grazed in winter then harvested for grain)

The quickest way to get widespread anthelmintic resistance is to deworm an entire group of cattle and then put them on a clean pasture. In this way we have no susceptible parasites on pasture, and we have eliminated the susceptible parasites in the animals by deworming them. The only parasites left in the animals are resistant. When they reproduce, they will contaminate the pasture with an almost pure population of resistant parasites and there will be no susceptible larvae on pasture to dilute the resistant worms.

Another common scenario for development of resistance is grazing cattle on permanent pastures combined with frequent use of dewormers. This is especially true of products that have a residual effect for weeks. Initially there is a mix of susceptible and resistant parasite larvae on the pasture, but as the cattle graze day after day, the larvae themselves or the mature worms that develop from the susceptible larvae are killed by the residual product, and only resistant parasites survive. Egg shedding is then only by resistant parasites, which eventually shifts the population to mostly resistant parasites both in the animals and on the pastures.

The above situation can be avoided by trying not to eliminate *all* parasites on a ranch. Cattlemen should work with their veterinarian to find a balance between keeping overall parasite levels low enough to prevent economic losses while at the same time retaining enough susceptible worms in refugia to slow the progression of anthelmintic resistance.

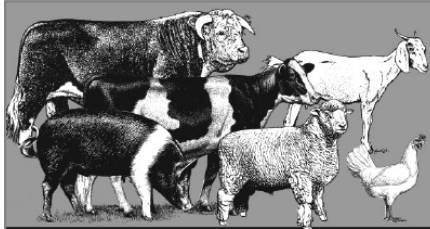
Diagnostics

With the emergence of AR a “deworming schedule” is no longer appropriate. Designing a parasite control program must be done on each individual ranch based on diagnostic testing results. There are two types of tests that should be performed:

- Anthelmintic efficacy
 - Fecal egg count reduction test (FECRT)
- Routine surveillance
 - Quantitative fecal egg counts
 - Modified Wisconsin sugar float or Mini-FLOTAC for cattle > 1 year of age
 - McMaster for cattle < 1 year of age
 - Multiple age groups and multiple seasons

The herd veterinarian should be consulted about exact testing procedures and timing of sample collection.

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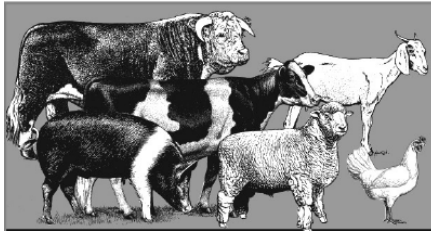


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Principles of Control

- Increase overall herd immunity
 - Proper nutrition will help cattle fight the effects of parasites
 - Decrease other stressors (heat, weaning, handling, etc.)
- Develop a refugia program with a veterinarian based on diagnostics and knowledge of overall management
 - For cow-calf operations
 - For young cattle (weaned calves, replacement heifers, young cows with first calf) that usually benefit from anthelmintic treatment and are going on permanent pasture utilize selective nontreatment (not treating a small part of the group)
 - Treat 70-90% of the group and leave 10-30% to preserve refugia
 - Base percentage on results of FECRT
 - Leave the heaviest untreated
 - For adult cattle utilize targeted selective treatment (select which *groups* of animals to treat)
 - Bulls are more susceptible to parasites and generally benefit from treatment
 - Avoid treating cows >3-4 years-of-age
 - They serve as a source of refugia for the herd
 - Allows for long term selection of cows that thrive without the assistance of dewormers
 - Exceptions
 - In stressful years (ex. drought) then use selective nontreatment and treat based on body condition score
 - If liver flukes are present (see LSU AgCenter Fact Sheet on liver flukes)
 - For stocker cattle
 - If on permanent pasture utilize selective nontreatment
 - If on non-permanent pasture treat the entire group (only appropriate for cattle destined for the feedlot not those returning to a cow-calf operation)
 - Avoid deworming all animals in a group before turnout onto clean pastures
 - This is especially critical with long-acting products
 - Avoid using the same pastures for young stock year after year
 - Don't bring resistant worms to the farm with herd additions
- Use and store products properly
 - Always use at least two classes of dewormer at the same time but only if using a refugia-preserving program
 - Dose based on actual weights if possible
 - Don't store products at the processing area
 - Follow label directions for storage temperature
 - Seek advice from the herd veterinarian to select the right product for right time of year and right age of animal

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