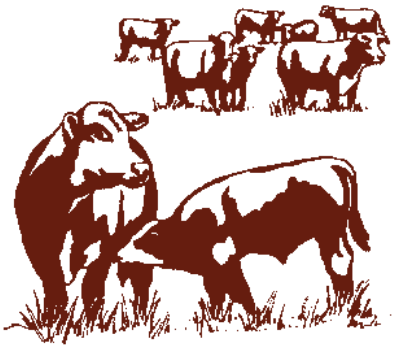
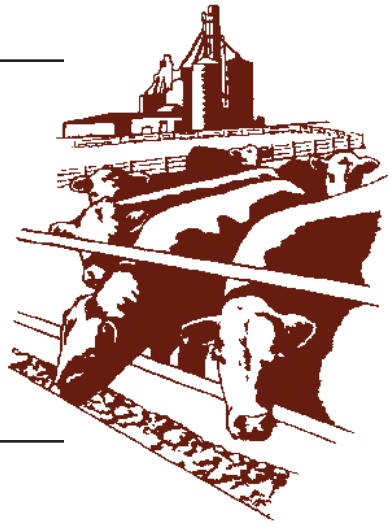


Beef Cattle Handbook



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Internal Parasites in Cattle

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Most cattle harbor some internal parasites (worms). Our varied geography and climate allow for a wide variation in the parasite burden. Levels of infection range from few parasites to large numbers that can cause severe weakness and even death.

Parasites are economically costly at much lower levels than previously thought. For example, subclinical parasitism (the presence of parasites in the absence of disease) may cost the producer significantly in lost weight gains, poor feed conversion, and increased disease. Economic losses in the United States from parasitic infections of livestock have been estimated at more than $3 billion a year.

Cattle may be infected with roundworms, liver flukes, or tapeworms. Young animals are more susceptible to clinical infection than adults, and malnourished animals are more disease prone than well-fed animals.

These internal parasites can be controlled with proper management strategies, which should include a deworming schedule. When using a dewormer, a producer should treat all the cattle in the herd or group.

Roundworms

Several types of roundworms infect cattle. One species lives in the lungs (lungworm), while other species live in the digestive tract. The roundworm burden for many cattle is sufficient to make deworming an economic benefit. In some areas of the U.S., dewormed cattle have achieved increased gains of as much as 60 pounds during the grazing season. Increased gains of up to 28 pounds per animal have been documented in semi-arid regions of Utah and Oregon.

Life Cycle

Adult roundworms deposit their eggs in the cattle intestine. These eggs pass into the environment in the cattle manure. After the eggs hatch and larvae molt, the infective roundworm larvae migrate up the forage and are ingested by grazing cattle. After ingestion, the roundworm matures in about 3 weeks (Fig. 1).

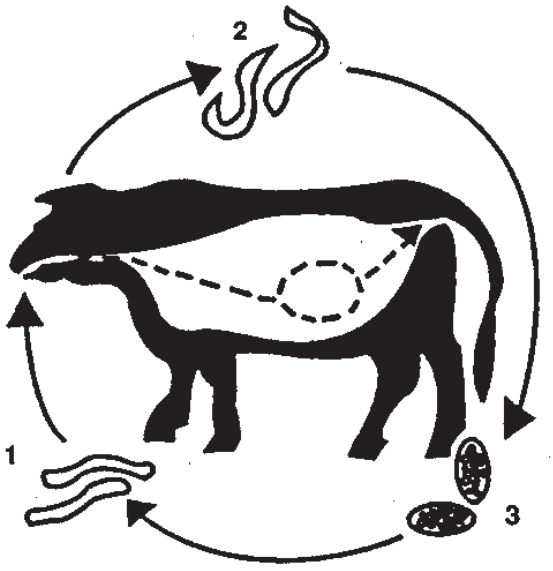

Fig. 1. Roundworm life cycle.

1 **Host ingests infective larvae.** Larvae mature to adult stage.
2 **Adult nematodes in digestive tract.** Eggs are laid in digestive tract.
3 **Eggs in feces.** Eggs hatch and larvae develop to infective third stage in soil and feces.

Sunlight, heat, and drying are lethal to roundworm larvae and aid in their destruction. However, winter does not destroy the larval population on pasture, as was once believed. Roundworm larvae migrate into soil or remain dormant under the snowpack until conditions are favorable for their development. The conditions that favor grass growth also favor parasite larvae growth.

Dung pats protect larvae. If pats are scattered around the pasture with harrowing during a wet season, the larvae will be widely spread. Pastures should be harrowed only during hot, dry periods (midsummer) when no cattle are present. Moisture, no matter what the source, is essential for larval survival and transport. Rain water, irrigation, water holes, springs, seeps, and leaky troughs may provide an ideal environment for survival—even in the middle of a desert.

Adult roundworms do not multiply in the cattle host; the eggs must pass into the environment to continue the parasite life cycle. Adult life span is only a few months. If larval infection from the environment is prevented, cattle will rid themselves of the adult parasites.

Some species of roundworms are capable of forming a dormant (inhibited) larval stage in the stomach or intestine of cattle. When environmental conditions are unsuitable for roundworm egg and larval development, the newly ingested larvae migrate into the stomach or intestinal wall and encyst. Later, when the ingested forage is lush and environmental conditions are favorable, these encysted larvae emerge from the gut wall, and male and female roundworms mate and begin contaminating grazing areas with their eggs. The maturation of encysted larvae may correlate with heavy pasture contamination, resulting in high levels of roundworm infection in grazing cattle.

Diagnosis

Analyzing fecal samples for roundworms by counting roundworm eggs per gram (EPG) of feces has been used to estimate the level of parasitism. However, the number of roundworm eggs shed in feces varies greatly at any given time. The number of eggs shed is usually much higher in spring and fall than in winter and summer. There is also great variation in the egg flotation technique. The use of a double centrifuge procedure with a saturated sugar solution is preferred. Other fecal flotation techniques are less desirable because they detect a smaller percentage of eggs. Although the EPG counts are not reliable as an accurate indicator of the parasite burden, they can help in monitoring egg excretion patterns and telling livestock owners that an infection is present or not.

Even a low EPG count can contribute greatly to pasture contamination. For example, a count of 30 EPG will result in 13,000 eggs per pound of manure, or 408,000 eggs per animal daily. For a herd of 100, that amounts to more than 40 million eggs per day.

Principles of Management

1. Deworm cattle based on positive signs of infection (i.e., parasite eggs in fecal samples), or on previous history (i.e., knowing that during fall through winter parasites living in northern states inhibit their growth and are not detectable by fecal analysis).
2. In certain areas of the country, pasture rotation favors reinfection, since year-round weather and climate allow significant numbers of larvae to survive in pastures. This must be taken into account when developing a parasite control program.
3. Depending on weather and climate, pastures grazed in spring and then again in the fall may have less risk for heavy to moderate infection than pastures grazed in the reverse order.
4. Where possible, allow cattle to graze the pasture for only one period during the year.
5. Pastures should be harrowed to break up manure pats only in the summer when it is hot and dry. Otherwise, harrowing simply scatters roundworm larvae and increases infection levels for grazing cattle. Roundworms may survive in manure pats up to 15 months if no moisture is present to stimulate larval growth.
6. In northern climates, the encysted (inhibited) larval stages are most likely to occur in the fall and early winter whereas in southern climates, the encysted (inhibited) larval stages are most likely to occur in the late spring and summer. Not all dewormers are effective against inhibited larvae.
7. Treating clinical parasitism at mid-season is a waste of time and money unless cattle are moved to a clean pasture right after treatment.
8. In the feedlot, evaluate the source of new cattle and decide whether to deworm at entry based on that information. There is usually a benefit to deworming during the first 90 days. Cattle kept beyond 90 days will gain little benefit from deworming at entry. Do not overlook the possibility that some cattle may carry encysted roundworm larvae; it takes special products to remove these encysted larvae.

What to Use and When

Products effective against internal parasites are listed in Table 1. Consult with a veterinarian about your operation to determine when to deworm and what products to use. The following can be used as a general guide and adapted to each specific situation.

1. Subclinical infections (less than 30 eggs per gram of feces).
   a. In several trials conducted in Montana, Oregon, and Utah, deworming cows with a broad spectrum product that kills inhibited larvae as well as immature and adult parasites has been shown to be cost effective. Cows dewormed in the late fall carry more weight through winter, wean heavier calves, and in some cases, breed back faster than nontreated controls within the same herds.
   b. Individual producers in consultation with their veterinarians need to decide whether deworm-

Table 1. Dewormers for Cattle.

Generic name	Brand names	Route*	Cmments
Thiabendazole	TBZ	B, D, F, P	Parasite resistance is a problem.
Levamisole	Tramisol	B, D,I, S	
	Ripercol		
	Levasol		
	Totalon		
Ivermectin	Ivomec	I, S	Very effective against roundworm larval and encysted stages and external parasites.
Morantel	Rumatel		
Nematel	B, F		
Fenbendazole	Panacur		Effective against tapeworms.
Safe-Guard	D, P, Salt		Some effect on encysted roundworm larvae.
Albendazole	Valbazen	D	Effective against roundworms, liver fluke, and tapeworms.

**Route administration: B-bollet, D-drench, F-feed, I-injectable, P-paste, S-skin, Salt-salt block.*

ing cows with subclinical infections will be profitable for their operations.

2. Moderate infections
   a. Cows: Deworm in fall to provide maximum benefit.
   b. Calves: Deworm at weaning if you are keeping them or are getting paid by the buyer to do so.
   c. Stockers: Deworm at weaning (or acquisition) and thereafter as required or indicated by finding parasite eggs in fecal samples.
3. Heavy infections
   a. Cows: Deworm in fall same as above, then again 3 to 4 weeks after turnout in the spring. The third deworming should be given 3 to 4 weeks later. Third treatment may be delayed depending on product used and/or negative egg count after 4 weeks.
   b. Calves and stockers: Deworm in the same pattern as cows in addition to deworming at weaning or acquisition.

Note: For improved results, move cattle to a clean pasture (free of parasites) immediately after deworming.

Liver Flukes

It takes only a few liver flukes to reduce cattle gains, so if they are present in the herd, deworming is of economic benefit. An aquatic snail is the intermediate host in the fluke cycle. Wherever the environment is moist enough to support snails, liver flukes are likely to be present. Fig. 2 shows the liver fluke life cycle.

In areas where the soil temperature falls below freezing for 30 days or longer and the perma-frost extends below 30 inches, most liver fluke larvae may be killed. In other areas where this does not occur, large numbers of larvae survive to continue the cycle in the late spring. Most new liver fluke infections do not occur until August or September. Larval migration and maturation in cattle requires another 8 to 12 weeks, so fluke eggs may not be found in cattle feces until December or January.

The most reliable method for diagnosing fluke infection is to examine the liver of cattle from pastures suspected of harboring flukes. If adult liver flukes are present, a deworming and control program is required. Livers can be examined when cattle are sent for processing or at necropsy when they die. A liver fluke egg sedimentation technique can be used to look for eggs in the feces of living cattle, but the egg flotation technique used to check for roundworms will not detect fluke eggs.

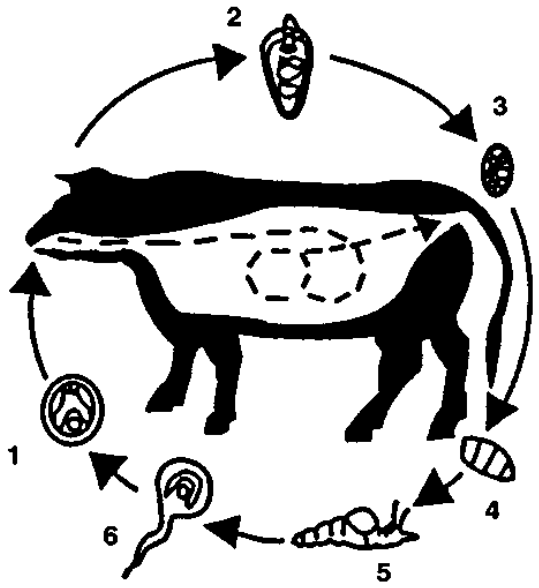

Fig. 2. Liver fluke life cycle.

1 **Host ingests metacercarial cyst.** Metacercariae, which are freed during digestion, become young flukes, migrate to bile ducts, and mature to adult stage.
2 **Adult trematodes in billary system.** Eggs are laid in bile ducts.
3 **Eggs in feces.** Miracidia develop in eggs.
4 **Free-swimming miracidia hatch from eggs in water.** Miracidia penetrate snail.
5 **Sporocysts and then rediae develop in snail.** Cercariae develop in rediae.
6 **Free-swimming cercariae emerge from snail.** Cercariae encyst on vegetation in water and become metacercariae.

Simple management efforts will control the liver fluke in small areas of swamps, seeps, ditches, and ponds. Consider fencing cattle away, draining the area, or using copper sulfate to kill the snails. These methods are not effective for large areas.

Producers can buy two products to fight liver fluke infection in cattle: clorsulon (CURATREM-MSD Agvet) and albendazole (Valbazen-Norden Labs). Clorsulon works better against migrating larval stages of liver flukes and should be used in November or December. It acts only against liver flukes. Albendazole is not as effective as clorsulon against the early larval stages and will work best after January 1. It could also be used earlier in the year, then repeated in January to March. Albendazole is also effective against tapeworms and roundworms.

Tapeworm

The effect of adult tapeworm infection on cattle is considered to be minimal. Individual tapeworm segments can often be seen in the feces of infected cattle. An intermediate host is required for development of the adult intestinal tapeworm. For cattle tapeworms, this intermediate host is a forage mite that lives in pastures. The mites become infected with tapeworm larvae, and cattle become infected with adult tapeworms by ingesting the mites while grazing. If tapeworms are a problem, two drugs, albendazole and fenbendazole, are effective and one of these products should be included periodically in the deworming program.

Adapted from CATTLE PRODUCER'S LIBRARY CL690

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