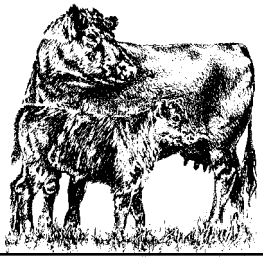

Western Beef Resource Committee *Fourth Edition*

Cattle Producer's Handbook

Animal Health Section 690

Internal Parasites of Cattle

Dr. Bill Kvasnicka, D.V.M., Extension Veterinarian
Ron Torell, Northeast Area Livestock Specialist
Ben Bruce, State Livestock Specialist
University of Nevada

Parasitologists estimate that internal parasites cost American cattle producers more than $200 million each year. If subclinical losses could be measured the total loss would be much greater.

If cattle producers are not controlling internal parasites they are probably losing $10 to $40 per cow each year. Researchers estimate that 85 percent of all cattle are infected with brown stomach worms, and 67 percent are infected with large stomach worms (Table 1). Not surprising then, that research shows using dewormers can be highly profitable.

Cows that were dewormed systematically were 25 pounds heavier coming off summer pasture and bred back 6 to 9 days earlier. Infected calves that were dewormed while nursing weaned from 12 to 38 pounds heavier than controls. Stocker cattle receiving dewormers showed similar weight advantages, and improvements in feed conversion and average daily gain were shown in fed cattle. Achieving these results takes planning.

Most cattle producers recognize that internal parasite infestation can damage their livestock. Treatment with one or several dewormers is commonly applied. Too often deworming occurs when it is convenient or when the cattle are being handled. Producers must realize that such treatment is being applied after the cattle have been infected and the damage caused by internal parasites has occurred.

Internal Parasite Epidemiology

Internal parasite worm eggs are shed on the pasture or range by infected cows and calves. The eggs survive cold weather and drought, subsequently hatching when warm, moist conditions exist. Microscopic larvae are then dispersed, with some trickling deep into the soil and others carried onto surrounding grass. The free-living larvae feed on fungi and other soil and grass microorganisms and represent pasture contamination.

When these larvae have developed to an infective stage, they may be found in dewdrops on blades of grass early in the morning and seasonally in late spring and late summer/early fall. Cattle become infected while grazing. Upon passage of grass to the stomach, infective larvae penetrate into gastric glands. Larvae emerge from the glands as adults and the life cycle is complete.

Infective larvae that are picked up in March and April in southern climates often will remain in arrested development or as inhibited larvae for 4 to 5 months, effectively over summer until late August to October. These larvae then rapidly increase in size, emerge in large numbers, and cause massive destruction to the gastric glands, bringing stomach function to a virtual halt. The host cow or calf becomes clinically ill with anemia, accumulation of body fluid (edema) often seen as "bottle jaw," and loss of appetite.

Some cattle are overwhelmed and die; others are set back for several months before adequate stomach repair can occur. In northern climates overwintering of inhibited larvae occurs with fall pickup of "arrest-prone" infective larvae followed by late winter (February-March) clinical ostertagiosis.

Thus, grazing cattle are infected, or re-infected, with internal parasites by ingestion of larvae that develops from hatching worm eggs. The larvae develop into adult worms in 3 to 6 weeks, and the female worms begin shedding additional eggs onto the pasture. Thus, cattle grazing pastures or rangelands contaminated with parasite eggs are infected and continue to shed eggs during the grazing season.

Pasture contamination levels increase during the grazing season, which exposes cattle to increasing levels of infection. The result is sub-clinical parasitism and, in some cases, clinical parasitism.

Parasitic infections are often more obvious in young animals than in older animals. However, older animals

Table 1. Common internal parasites of cattle.

Common name	Scientific name	Infective stages
Stomach worms		
Brown stomach worm	*Ostertagia ostertagi*	Adults, fourth stage larvae, inhibited fourth stage larvae
Barberpole worm	*Haemonchus contortus, H. placei*	Adults, fourth stage larvae, inhibited fourth stage
Small stomach worm	*Trichostrongylus axei*	Adults, fourth stage larvae
Intestinal worms		
Thread-necked intestinal worm	*Nematodirus spathiger, N. helvetianua*	Adults, fourth stage larvae, inhibited fourth stage
Hookworm	*Bunostomum phlebotomum*	Adults
Bankrupt worm	*Trichostrongylus colubriformis*	Adults
Nodular worm	*Oesophagostomum radiatum*	Adults
Small intestinal worms		
Cooperia	*Cooperia oncophora, C. punctata, C. pectinata*	Adults, fourth stage larvae, inhibited fourth stage
Lungworms	*Dictyocaulus viviparus*	Adults, fourth stage larvae
Tapeworms	*Moniezia benedeni, M. expansa*	Heads, segments
Liver flukes	*Fasciola hepatica*	Larvae after cycle in snail

can be damaged by internal parasites, especially during stress periods, such as lactation, breeding, or during times of the year when nutrition is inadequate. In addition, older animals serve as a source of infection for the younger more susceptible animals. Subclinical production losses are manifested by lower weaning weights, lower conception rates, and by a reduction in weight gain for stocker cattle, replacement heifers, and feedlot cattle.

Veterinarians can examine fecal samples for eggs of these worm parasites and can quantify them on a per gram of feces basis. By examining pre- and post-treatment samples from 10 to 20 percent of the herd, the dewormer's effectiveness can be judged and the potential for pasture contamination can be evaluated. Few or no eggs does not mean that there is no infection; instead an immature, non egg-producing population of worms could be present, and clinical or subclinical problems might still occur.

Prevention of Internal Parasites

A basic beef cattle production program should be designed to prevent diseases by strategic administration of vaccines and medications. Internal parasitism can be prevented by timely administration of modern dewormers. The key to preventing internal parasites in cattle is to prevent pasture contamination.

Prevention of Pasture Contamination

1. Deworm cattle in late fall or before placing cattle on a grazing area. Select a dewormer (Type II Dewormer, see Table 2) that effectively kills the adult worms and the developing larvae.
2. The cattle will become re-infected by ingestion of larvae hatching from the eggs that contaminated the pasture during the previous season. As previously mentioned, within 4 to 6 weeks the grazing cattle start shedding eggs and re-contaminate the pasture.
3. Deworming stocker cattle 4 weeks after grazing commences prevents resultant pasture re-contamination. Deworm beef cows and calves 4 to 6 weeks after grazing is initiated. Some newer dewormers claim persistent activity. If the claim is accurate, timing for the second deworming could be extended. Read the label and consult with an animal health adviser to determine the proper timing.

Because deworming has required gathering and handling the herd, producers have been hesitant to administer a second deworming. An effective dewormer, formulated in free choice mineral or in a block, is available that can be self fed. The second treatment can be administered without gathering the cattle.

Strategic Deworming

The term in common use for preventing nematodes in beef cattle by stopping pasture contamination is "strategic deworming." A strategic deworming program must be outlined specifically for each ranch and for each cattle management plan. To design a plan a rancher or consultant should consider the following questions:

- When does the grazing season (grass growth) start and end?
- Will pasture rotation occur or will the cattle be moved from private land to a grazing allotment?
- What is the stocking rate?

Table 2. Cattle parasiticides.

Dewormer	Internal parasite	Treatment
Levamisole Type I (Levasole®, Tramisol®, Totalon®)	Stomach worms[1], lung worms[1]	Drench, injection[5], pour-on, bolus, feed, block
Fenbendazole Type II (Safe-Guard®)	Stomach worms[1], lung worms[1]	Drench, paste, feed, block, mineral, topdress, mix in feed
Fenbendazole Type II (Panacur®) Type II	Stomach worms[2], lung worms[1], tapeworms	Drench, paste
Oxfendazole Type II (Synathic®)	Stomach worms[2], lung worms[1], tapeworms	Drench, paste, injection[6]
Albendazole Type II (Valbazen®)	Stomach worms[2], lung worms[1], tapeworms, adult flukes	Drench, paste
Moxidectin Type II (Cydectin®)	Stomach worms[2], lung worms[1], grubs, sucking lice, manage mites, biting lice, horn flies	Pour-on
Eprinmectin Type II (Ivomec® Eprinex®)	Stomach worms[2], lung worms[1], grubs, sucking lice, manage mites, biting lice, horn flies	Pour-on
Doramectin Type II (Dectomax®)	Stomach worms[2], lung worms[1], grubs, sucking lice, manage mites, biting lice[3]	Injection[5], pour-on
Ivermectin Type II (Ivomec®[3-4]) (Double Impact™[4]) (Top Line™[3]) (Unimectrin™[3]) (Ultramectrin™[3-4])	Stomach worms[2], lung worms[1], grubs, sucking lice, manage mites, biting lice, horn flies[3]	Injection[5], pour-on
Ivermectin + Clorsulon Type II (Ivomec Plus®)	Stomach worms[2], lung worms[1], grubs, sucking lice, manage mites, adult flukes	Injection[5]
Clorsulon (Curatrem®)	Immature and adult flukes	Drench

[1]Adults, developing larvae.
[2]Adults, developing larvae, inhibited larvae.
[3]Pour-on.
[4]Injectable.
[5]Subcutaneous.
[6]Intraruminal.

- Are the pastures or meadows irrigated?
- What class of cattle will be grazing the pasture or range?
- What type of dewormer will be used and when should it be administered?
- What is the efficacy of the dewormer against the common nematodes?
- What is the dose, method of administration, and duration of action of the dewormer chosen?
- When is the best time to treat for internal parasites and for external parasites?
- What is the cost of the dewormer and the cost of administering the medication?

Available Dewormers

Dewormers are manufactured as pour-ons, injectables, drenches, pastes, boluses, blocks, feed for topdressing, mineral mixes, and as feed additives for mixing in feed or mineral (Table 2).

Effective Use of Dewormers

Type I dewormers are effective only on adult parasites. Type II dewormers control adults and the developing larva. In addition, Type II dewormers also control the inhibited stages of internal parasites. If a Type II dewormer is strategically applied harmful levels of internal parasites will be prevented. **When internal parasitism has been reduced to a safe level producers need not be concerned about treating for inhibited forms of nematodes**.

Timing of treatments is critical if a strategic deworming program is to be successful. Review the section about "Prevention of Pasture Contamination" to determine when the cows, calves, or stocker cattle should be treated.

If all animals grazing a pasture are free of worms at the start of grass growth (either through fall or winter deworming), they will not need to be dewormed again until the developing larva have matured into egg laying female worms. The life cycle takes 3 weeks in calves, 4 weeks in yearling cattle, and 6 weeks in adult cattle.

The number of mid-summer treatments depends on the length of the grazing season and the duration of action claimed by the manufacturer of the dewormer being used.

Remember that incoming stocker calves to be backgrounded or cattle to be finished in the feedlot may originate from many places and should be dewormed upon arrival with an adulticide-larvicide dewormer.

Should Beef Cows Be Dewormed?

Healthy adult cows usually harbor small numbers of parasites. They develop an immunity to prevent a heavy parasite infection level. Cows may not appear to be infested, but in most trials, cows treated with dewormers will wean heavier calves than untreated cows.

Beef cattle producers should deworm their cow herd. Prevalence studies show that most cows harbor GI nematodes. Visual appraisal would indicate that the cows did not need treatment, but calf-weaning weights indicate otherwise. Cows produce large quantities of worm egg laden manure resulting in pasture contamination.

Failure to treat the cows means that the calves pick up and harbor production-limiting levels of nematodes. This accounts for the differences in weaning weights. Split pasture trials attest to the cost benefit of deworming beef cows.

Summary

Most cattle harbor internal parasites. Prevention of internal parasites rather than treatment should be a rancher's goal. The objective of an internal parasite preventive program is to reduce parasite challenge by lowering parasite numbers on the pasture and inside the animal.

References

Bliss, D. 1991. Preventive strategy for parasite control in pasture cattle. Hoechst Roussel, A640149, C/FA11452.

Bliss, D., W. Kvasnicka, J. Campbell, R. Corwin, and L. Laurence. 1993. Strategic deworming of cattle. Agri-Practice. 14:5, 6, and 7, May, June, and July/August.

Kvasnicka, W. G., D. H. Bliss, and G. H. Myers. 1989. Gastrointestinal nematode surveillance in Nevada by corprological examination. Proceedings of 10th Annual Western Food Animal Disease Research Conference, Fort Collins, CO.

Kvasnicka, W., D. Bliss, and R. Torell. 1997. Evaluation of anthelmintic treatment in cattle grazing Great Basin Rangeland in Nevada and California. Proceedings: American Association of Veterinary Parasitologists, 42nd Annual Meeting. pp. 56.

Kvasnicka, W., D. Bliss, and R. Torell. 1997. Prevalence of parasite contamination on Great Basin pastures and ranges from cow/calf herds as determined by fecal worm egg counts. Proceedings: American Association of Veterinary Parasitologists, 42nd Annual Meeting. pp. 76.

Kvasnicka, W., L. Krysl, S. Lewis, R. Torell, and G. Veserat. 1993. Strategic deworming program to control parasitism in a cow/calf herd in the Great Basin Region. Proceedings of American Association of Bovine Practitioners.

Kvasnicka, W., L. Krysl, R. Torell, and D. Bliss. 1996. Fenbendazole in a strategic deworming program. Compendium on Continuing Education, Food Animal Medicine & Management, A Supplement to Compendium. 18:4, S113-S117.

Myers, G. H. 1988. Strategies to control internal parasites in cattle and swine. J. of Animal Science. 66(6):1555.

Torell, R., W. Fahsholtz, B. Kvasnicka, and L. Krysl. 1991. Parasite prevalence and control in stocker calves grazing irrigated meadows in northeastern Nevada. Cattleman's Update. SP-91-01:11-17.

Fourth edition; December 2016 Reprint