BCRC
BEEF CATTLE RESEARCH COUNCIL

Fact Sheet

RESEARCH & TECHNOLOGY DEVELOPMENT FOR THE CANADIAN BEEF INDUSTRY

UNIVERSITY OF CALGARY VETERINARY MEDICINE

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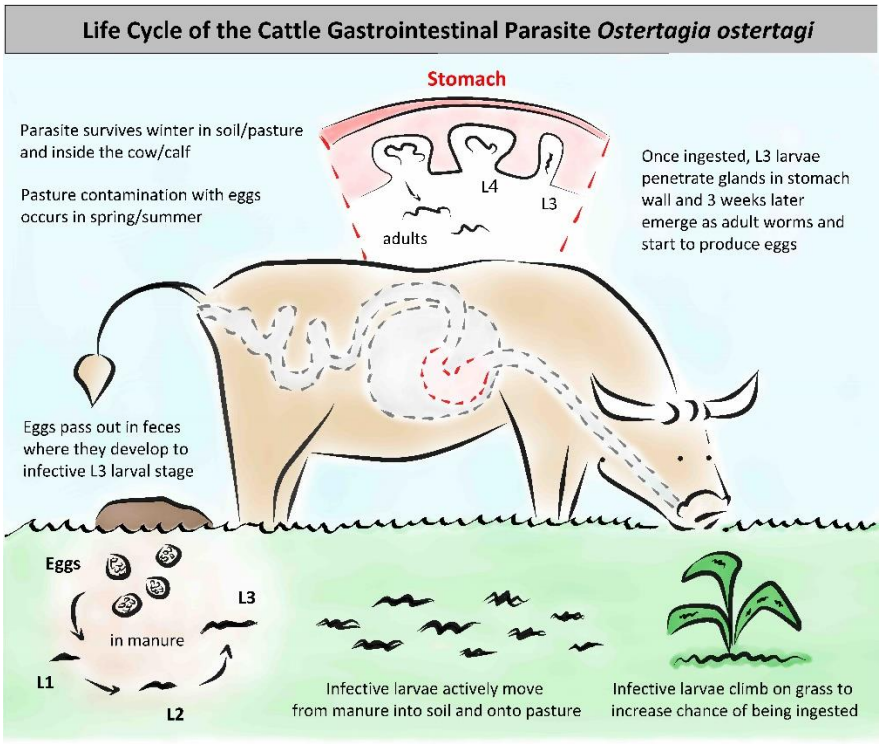
Internal Roundworm Parasite Management in Beef Cattle in Canada

There are many different parasites that cause production impacts and disease in Canadian beef cattle. Their control is an important part of maintaining health, welfare and production. It is important to be aware that different parasites each require specific control measures. **Internal parasites,** such as roundworms and coccidia, live inside the gastro-intestinal tract whereas **external parasites**, such as lice and flies live on, or around, the animal. Each parasite species varies in importance depending the production system, the region and the climatic conditions in a particular year. It is important that all parasites are not considered as a single group when planning control measures.

Why should we be concerned about internal roundworm parasites in Canada?

Roundworm parasites are considered to be of economic importance for Canadian beef cattle. Unlike external parasites such as lice and flies, which are often clearly visible, internal roundworm parasites are less obvious. Consequently, Canadian beef producers are often more concerned with controlling visible external parasites.

A common **misconception** is that it is too cold in Canada for roundworm parasites to be a problem, which is not the case. Several species of roundworm parasites are well adapted to cold weather, including *Ostertagia ostertagi, Cooperia oncophora,* and *Nematodirus battus.* These species are widespread in Canadian beef cattle, resulting in production impacts.



Although cattle younger than two years of age typically have the highest worm burdens, and are most impacted by internal roundworms, even adult cattle carry worms and contribute to pasture contamination.

Figure 1. The life cycle of the *Ostertagia ostertagi,* an internal roundworm parasite

These parasites survive the winter as adult worms and inhibited larvae inside the stomach of cows and calves. Infective larvae on the pasture also penetrate into the soil and can survive on pasture over the winter, even in very cold conditions, although this depends on the temperature, moisture and snow cover in a particular year. During the spring, summer and fall, the numbers of infective larvae build up on pastures, which also depends on the temperature and moisture during the grazing season. Warmer, wetter summers and regions build up more pasture contamination leading to higher worms burdens in the cattle.

Pour-on dewormer treatments used in Canadian beef cattle are often only partially effective at clearing worm burdens. This may be due to the products not being properly applied as well as drug-resistant parasites. It is important that producers use dewormers to maximize health and production but avoid overuse and to maintain their efficacy in the longer term. The internal roundworm parasites are not well controlled in Canadian beef cattle at present as documented by fecal egg counts across Canada.

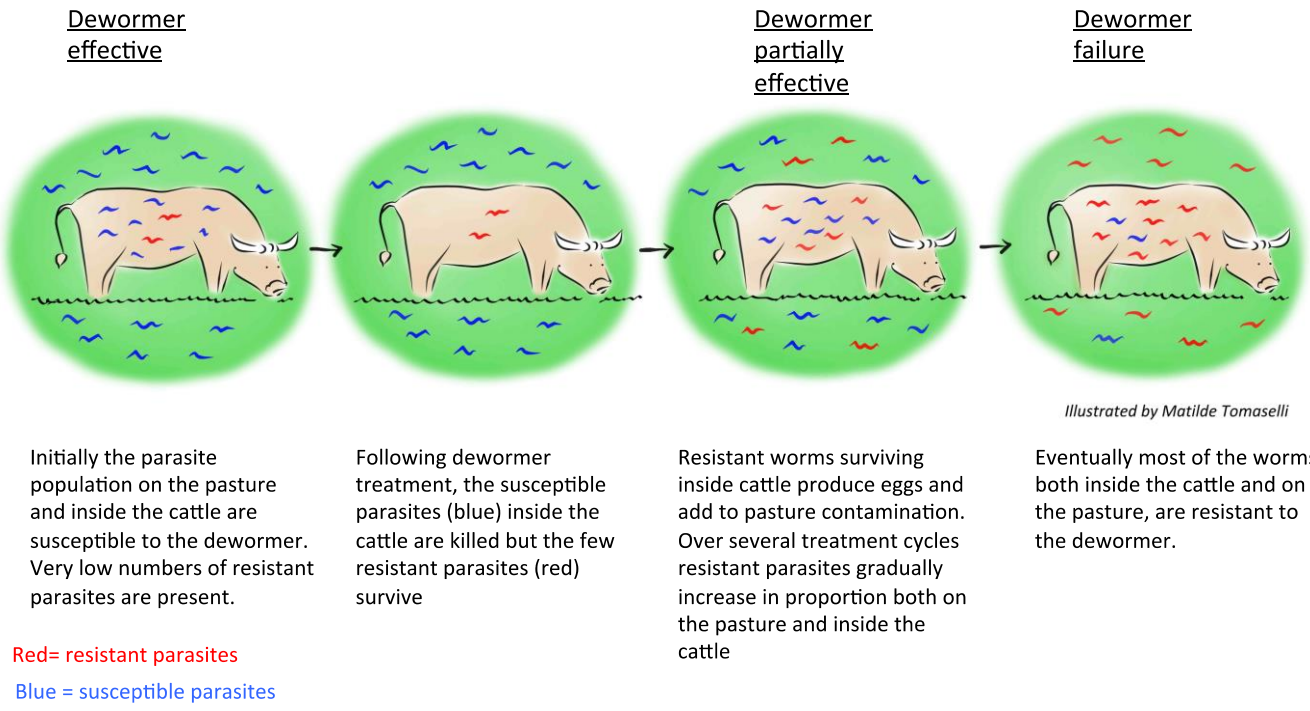


Figure 2. The progression of parasite resistance.

The Economics of Parasite Control

A largest academic assessment of production impacts of internal roundworm parasites occurred in North America in 2007[1]. The study evaluated the economic impact of parasite control, growth promoter implants, sub-therapeutic antibiotics, ionophores and β-agonists. The study determined that deworming had the biggest positive impact in cow-calf operations and the second highest benefit in feedlot cattle.

There have been no large studies of the economic impact of internal roundworm parasites in Canadian beef cattle in recent years, however studies from the northern US states[2] showed that production gains occurred when parasite burdens were eliminated using a long-acting anthelmintic. Untreated cattle had fecal egg counts of 2-84 eggs/gram. Egg counts within this range are commonly seen in Canadian beef cattle with the major species present being round worm species like *Osteragia ostertagi*, *Cooperia oncophora* and *Nematodirus helvetianus*. This suggests that good roundworm control should produce significant production gains in Canadian beef cattle.

[1] Lawrence, J. D., and M. A. Ibarburu. 2007. "Economic Analysis of Pharmaceutical Technologies in Modern Beef Production." Proceedings of the NCCC-134 Conference on Applied Commodity Price Analysis, Forecasting, and Market Risk Management. Chicago, IL. [https://www.agrireseau.net/bovinsboucherie/documents/confp05-07.pdf]

[2] B.N. Kunkle et al. / Veterinary Parasitology 192 (2013) 332–337

Controlling and Preventing Roundworm Parasites

A good internal roundworm parasite control program should maximize production gains, minimize disease risk but avoid indiscriminate and unnecessary dewormer use. Roundworm parasite control differs significantly between cow-calf, stocker and feedlot cattle as well as with the grazing and management strategies of each individual herd.

Strategic parasite control involves using the correct product at the correct time on the animals that need it most.

Producers should consult with their veterinarians to assess their full operation, environment and animal health inputs in order to develop a parasite control program appropriate for their specific herd.

Evaluate Grazing Management as part of your overall Parasite Control Strategy

- **Avoid overstocking and overgrazing,** which leads to increased pasture contamination with infective parasite larvae.
- **If possible, avoid grazing the same pastures in the fall of one year and the spring of the next.** Infective parasite larvae from eggs deposited in manure in fall may survive the winter on the pasture and be a source of contamination for cows and calves grazing in the spring.
- **If possible, harrow pastures only when it's hot and dry.** Harrowing under other conditions will increase the potential exposure of cattle as infective larvae are scattered from fecal pats across the area.
- **Consider parasite control when planning rotational grazing strategies.** If implementing a twice-over or rotational grazing system, be aware that pastures previously grazed by stocker cattle may be heavily contaminated with infective parasite larvae and be a risk to younger cattle.

Monitor Parasite Burdens

- **Conduct fecal egg counts** to assess internal roundworm parasite burdens and determine your target parasites. Fecal samples from 20 cows in the spring and from 20 calves in the fall will provide useful information on parasite burdens in the herd and the effectiveness of current control programs.

Use Dewormers Effectively and Responsibly

- **Choose the correct roundworm dewormer.** Common products used in Canada are found in Table 2. Each dewormer varies in effectiveness against specific internal parasites. External parasite control also needs to be considered.
- **Administer the dewormer at the correct time.** Dewormers should be used strategically, not just conveniently, to minimize pasture contamination and prevent the build up of roundworms in the cattle during the grazing season. In many herds, roundworm control depends on pour-on treatments applied in the fall, however spring treatments can sometimes provide added benefits leading to lower roundworm burdens in the fall.
- **Administer the dewormer properly.** Weigh cattle to ensure you administer the correct dose for the particular class of cattle you are treating. Use the proper route of delivery for the specific product (oral, injectable, fed, topical). Follow veterinary advice and label instructions for administration, storage and withdrawal times prior to slaughter. Adhere to recommended practices in Canada's Verified Beef Production Plus on-farm food safety program. Properly dispose of expired product, empty containers and used needles.
- **Check the effectiveness of dewormer treatments.** Do not assume a dewormer treatment has been effective. Take fecal samples and perform fecal egg counts two weeks after deworming.
- **Treat new cattle entering your herd to minimize the risk of introducing drug resistant parasites.** A combination of dewormers from the two major drug classes (eg. Ivermectin plus fenbendazole) will minimize the risk of bringing resistant parasites into your farm.

Progressive ideas to minimize the development of resistance and maximize production gains

- **Leave a small proportion of the herd untreated.** In most well managed herds, the 10-20% of cattle that are in the best condition actually don't benefit from dewormer treatments because they carry low worm burdens. Left untreated, there will be no significant reduction in herd production gains but there will be less selection pressure on parasite resistance.
- **Use a combination of two dewormers:** Dosing cattle with two dewormers of different classes at the same time both maximizes the effectiveness of treatment and slows the development of resistance. Do not mix products before dosing; administer each sequentially, using the correct administration route and following the label instructions.

Table 2. Common Parasite Control Products for Internal Roundworms

Common Parasite Control Products	Parasites Controlled	Mode of Administration	Examples of Brand Name of Products Registered for Use in Canada
Fenbendazole[1]	**Internal Roundworms**	**Feed, Mineral, pellets** **Oral Drench**	**Safeguard** **Safeguard, Pancur**
Albendazole[1]	**Internal Roundworms**	**Oral drench**	**Valbazen**
Ivermectin[2]	**Internal Roundworms & External**	**Topical pour-on** **Injectable**	**Bimectin, Ivomec, Noromectin**
Moxidectin[2]	**Internal Roundworms & External**	**Topical pour-on**	**Cydectin**
Doramectin[2]	**Internal Roundworms & External**	**Topical pour-on** **Injectable**	**Dectomax**

[1] Fenbendazole and albendazole belong to same drug class (Benzimidazoles).

[2] Ivermectin, Doramectin, Moxidecitn belong to same drug class (Macrocyclic lactones).

The Beef Cattle Research Council, a division of the Canadian Cattlemen's Association, sponsors research and technology development and adoption, in support of the Canadian beef industry's vision to be recognized as the preferred supplier of healthy, high quality beef, cattle and genetics.

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