Parasites

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Parasitism by helminth parasites (roundworms, lungworms, tapeworms, and flukes) is an important factor in livestock productivity. It is impossible to give an accurate estimate of the economic importance of parasitic disease because it varies between countries, between regions and even between farms, depending on climate, intensiveness of stocking, and worming practices. It is a fairly well accepted assumption that parasitized animals:

- Fail to achieve full genetic potential
- Show reduced weight gains
- Produce meat of poor quality
- Produce less thrifty offspring

Before beginning a discussion on chemotherapy (worming) of helminth parasites an overview is necessary. A parasite is a smaller organism that lives on or in and at the expense of a larger organism, called the host. By convention, the presence of a parasite may be detrimental, indifferent, or beneficial. Parasites are grouped according to location; an ectoparasite includes those organisms living outside a body (ie. flies, lice, ticks, mites) and endoparasites are those living within a body (ie. protozoan and helminth). Life-cycles of parasites determine the type of control.

In general, ectoparasites are controlled by: strips, baits, sprays, foggers, dust bags, or pour-on products aimed at the adult (fly, louse, mite, or tick). There are some drugs which will also kill larvae of these parasites in the manure (ie. phenothiazine); or are injected and kill the insect as it takes a blood meal (ivermectin).

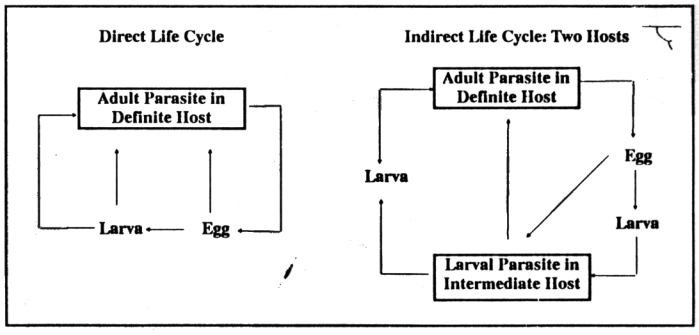
With buffalo one must caution when applying pour-on preparations such as Totalon. **Reportedly bison have a higher density of hair follicles compared to dairy or beef animals,** and therefore, may absorb more drug into their systems, which may be overly toxic. IT IS ADVISABLE TO EITHER USE EXTREME CAUTION WITH APPLICATION OF THESE PRODUCTS, OR NOT TO USE THEM AT ALL!!!

To help clarify the enigmas of helminth (roundworms, lungworms, tapeworms, and flukes) life-cycles, simplified schemes are shown. In these diagrams, the stages outside the boxes are responsible for transmission.

In the direct life-cycle there is only one host, the final host. The egg or larva is released from the host, usually in the feces and after development on the ground is acquired by being eaten by a new host, or by penetrating that host's skin. Examples of the direct life-cycle include: lungworms and nematodes—roundworms and hookworms.

In the two hosts indirect life-cycle, passage through both hosts is mandatory for completion of the life-cycle. Examples include tapeworms and flukes. For instance, a ruminant tapeworm such as Monezia (a type of tapeworm), utilizes a mite as an intermediate host. Buffalo become infected when they ingest infested mites.

Keep in mind that these various helminths/worms achieve the same end, a poor quality animal. However, this occurs through different means. An acutely infected animal may show gastrointestinal signs, ie. diarrhea, or respiratory signs, ie. coughing, depending on the species of worm. The bottom line is to determine the worm/s involved, what drugs appropriately kill those worm/s, and apply those drugs at strategic times based on the life cycles previously outlined. **NOTE:** Coccidiosis is a protozoal infection and will be dealt with separately. The life cycle of coccidia is complex and treatment involves a different array of drugs compared to those typically used on helminth infections.



The fundamental concepts of helminth parasitism in grazing animals are that:

- Every animal is infected and that contamination of the pasture is continuous due to the large numbers of offspring (larva and eggs) produced.
- Most helminths are susceptible to dry and cold environments, but a number have adapted to survive even the most severe winter.
- Certain parasites once inside the host, slow down their development for several months and resume their growth when again the environmental conditions are favorable for their survival.

It is necessary to remember:

- One should treat the entire herd.
- Good nutrition increases the resistance of livestock to parasites.
- Short pastures, besides being poor nutritionally, encourage infection because larval concentration on the grass blades will be at a maximum.
- Marshes and wet areas around feeding troughs should be properly fenced off. Such areas may be foci of snails.
- Strategic dosing is usually carried out before the animals give birth, in the middle of summer, and in the fall.

- Optimally, animals should be treated and removed to a new unused pasture. Allow pastures to 'rest' for approximately one month prior to introducing new animals.

Protective administration of suitable anthemintics is an important part of most preventative programs against parasitic disease. Treatment should be based on fecal examination by a veterinarian. The efficiency of treatment should be periodically measured by fecal egg counts.

There are a number of anthelmintics (wormers) on the market. These agents are used to treat buffalo although they have not been approved for them. This means that the efficacy of the drug was not tested on buffalo.

It is generally recommended to alternate the type of wormer used. The reason is drug resistance. Emergence of drug resistant strains of parasites previously susceptible to a given drug has been reported frequently. As an aside, it is widely believed the Ivermectin will be an anthelmintic which will supersede the resistance problem based on its' mode of action. However, I have become aware clinically of problems developing in herds which used ivermectin as the sole wormer. Fecals have provided evidence that the drug has lost much of its' efficacy over time. Therefore I would warn herdsmen to continue rotating wormers and sticking to a strict anthelmintic schedule.

Before listing commonly used wormers, some basic understanding of the types of worms/terminology is advantageous. A helminth is any type of internal worm. The helminths are subdivided into two groups: nematodes and platyhelminths. Nematodes include any roundworm such as: stomach, intestinal, or lungworms. Platyhelminths are generally considered harmless. However, increasing clinical evidence has shown otherwise. I have found in a variety of buffalo herds an increasing problem. Invermectin will not resolve this problem since it does not kill/control tapeworms. Therefore a drug such as Valbazen would be required.

ASK THE VET

If you have any questions concerning bison health and disease, please send your inquiries in letter form to: Kim Dowling, Editor, National Buffalo Association, Box 580, Ft. Pierre, SD 57532. As many inquires as possible will be addressed in each magazine.

Commonly Used Wormers

DRUG	METHOD OF USE	INDICATIONS	LIMITATIONS
Fenbedazole *Panacur	Oral	Removal of: adult lungworms & nematodes: larval stages of nematodes.	Safe in breeding animals. Not toxic to fetuses. 8 day slaughter withdrawal
Thiabendazole *Omnizole *TBZ *Thibenzole	Oral	Removal of: adult nematodes	Safe for: pregnant or breeding or young animals. 3 day slaughter withdrawal
Albendazole *Valbazen	Oral	Removal of: adult & larval stages of nematodes, lungworms. Adultstages of tapeworms and flukes.	Do not treat females during first 45 days of pregnancy. 27 day slaughter withdrawal
Levamisole *Ripercol-L *Tramisol *Levasole	Oral & Injectable	Removal of nematodes & lungworms withdrawal.	Much narrower margin of safety. Oral: 45 day slaughter Injectable: 7 day slaughter withdrawal.
Ivermectin *Ivomec	Injectable	Removal of nematodes, lungworms, grubs, lice & mites. Also some larval nematodes.	Highly effective & safe. Injection site reaction reported. 35 day slaughter withdrawal.

**manufacturers' name*