

**Animal Health**
Fact Sheet

CONTROLLING INTERNAL PARASITES IN UTAH CATTLE

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Most cattle harbor some internal parasites (worms) and Utah cattle are no exception. The varied geographic and climatic conditions of Utah allow for tremendous variation in the parasite burden of different cattle herds. The numbers of parasites varies from very few to so numerous as to cause severe weakness and even death of cattle. Parasite burdens are economically costly at much lower levels than was previously thought. For example, we now know that subclinical parasitism (presence of parasites in the absence of disease) may cost the producer a significant amount of money in lost weight gains, poor feed conversions, etc. Young animals are more susceptible to parasite infection than are adults. Moreover malnourished animals are more parasite prone than are well fed animals.

Cattle may be infected with liver flukes, tapeworms and/or roundworms. Economic losses due to parasitic infections of livestock have been estimated at more than \$3 billion annually in the United States. These internal parasites can be controlled with proper management strategies, which should include a pre-planned deworming schedule. When using a dewormer, treat all of the cattle in the herd (or group).

TAPEWORMS

The effect of adult tapeworm infection on cattle is considered to be minimal. The 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 (small insect) that lives in the pasture environment. These mites may be infected with tapeworm larvae and cattle become infected with adult tapeworms by ingesting the mites while grazing. Two drugs are effective against adult tapeworms: albendazole and fenbendazole. If tapeworms are a problem in a herd, one of these products should be included periodically in the deworming program.

LIVER FLUKES

Since the presence of only a few liver flukes can have a detrimental effect on cattle gains, deworming is considered to be economically worthwhile. An aquatic snail serves as the intermediate host in the fluke life cycle, just as the mite did in the tapeworm life cycle. Wherever the environment is sufficiently moist to support a population of snails, liver fluke may be present and capable of infecting cattle.

The majority of liver fluke larvae in the snails or in the environment are killed during Utah winters. As a result, liver fluke larvae that infect cattle the following summer must come from cattle already infected with adult fluke. Most new liver fluke infections do not occur in new herd addition cattle until August or September. Larval migration and maturation in cattle requires another 8–12 weeks, so fluke eggs may not be found in the feces until December or January.

Examination of the liver of animals from suspect pastures is the most reliable method to diagnose fluke infection. If adult liver flukes are present, a deworming and control program is required. The liver can be examined from cattle sent to slaughter or it can be examined at necropsy when cattle die. A fluke egg sedimentation technique can also 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.

For some grazing areas, rather simple tasks will result in complete control of liver fluke. For small areas of swamps, seeps, ditches or ponds consider:

1. Fencing cattle away
2. Draining
3. Use of copper sulfate to kill the snails

These methods are not effective for large areas.

Two products are commercially available for use against liver fluke infection in cattle: clorsulon (CURATREM - MSD Agvet) and albendazole (VALBAZEN - Pfizer). Clorsulon has a better effect against migrating larval stages of liver flukes and it should be used in November or December. This dewormer acts only against liver flukes and does not remove any other parasites. Albendazole is not as effective as clorsulon against the early fluke larval stages and will work best if used after January 1. Albendazole could also be used earlier in the year and then repeated again in January to March. It should be noted that albendazole is also effective against tapeworm and roundworms. A combination product of clorsulon and ivermectin (Ivomec-Plus) is also available and has a very broad range of action against internal parasites.

ROUNDWORMS

Several roundworms infect cattle. One species of roundworm resides in the lungs (lungworm) and the remaining species of roundworms live in the digestive tract. The roundworm burden for many cattle is great enough to make deworming an economic benefit. Increased gains of up to 60 pounds per animal in a grazing season have been reported in some areas of the USA and improved gains of up to 28 pounds have been documented in Utah!

LIFE CYCLE

Adult roundworms deposit eggs in the intestine which pass out to the environment in cattle manure. After the eggs hatch and the larvae molt, the infective roundworm larvae migrate up the forage and wait to be ingested while the cattle graze. Maturation of roundworms to the adult stage requires approximately 3 weeks in cattle.

Sunlight, heat and drying are lethal to roundworm larvae and aid in their destruction in the environment. Winter weather does not destroy the entire larval population on pasture as was once believed. The larvae migrate into the soil or remain dormant under the snowpack until environmental conditions again become favorable for their development. The growth of parasite larvae in the environment correlates very closely with grass growth in that the same conditions favor both.

Dung pats offer protection to roundworm larvae. If dung pats are scattered around the pasture with harrowing during a wet season, larvae becomes widely disseminated. Pastures should

only be harrowed during hot, dry periods (midsummer) when no cattle are present. Moisture is essential for larval survival and transport, and makes no difference if it comes from rain, flood irrigation or sprinkler irrigation. Water holes, springs, seeps, and leaky troughs may provide an ideal environment for survival, even in the middle of a desert.

There is no multiplication of adult roundworms within the cattle host; the eggs must first pass out to the environment in order to complete the parasite life cycle. Adult roundworms have a limited life span of only a few months. If larval infection from the environment is prevented, cattle will eventually rid themselves of the adult parasites. Some species of roundworms are capable of forming a dormant (inhibited) larval stage within the stomach or intestine of cattle. When environmental conditions are not suitable 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 mature to adult roundworms and begin contaminating grazing areas with their eggs. The maturation of encysted larvae correlates with heavy pasture contamination, resulting in high levels of roundworm infection in grazing cattle.

DIAGNOSIS

Analyses of fecal samples for roundworm eggs and counting of eggs per gram (EPG) of feces are frequently used to estimate the level of parasitism in infected cattle. However, there is great variation in the number of roundworm eggs that are shed in the feces at any given time. The numbers of eggs shed will usually be much higher from April to August (lush grazing) than from September to March (dryer feed). Although the EPG counts are not reliable as a measure of the parasite burden, they can be of value for monitoring the egg excretion pattern. There is also great variation with the egg flotation technique. The use of a double centrifuge procedure with a saturated sugar solution or the modified technique or the McMaster process are preferred for Utah cattle. Other fecal flotation techniques are less desirable because a smaller percentage of eggs are detected.

Even a low level EPG count can contribute greatly to pasture contamination with roundworm larvae. For example, a 30 EPG count will result in 13,000 eggs per pound of manure or 408,000 eggs per animal per day. That amounts to over 40,000,000 eggs per day for a herd of 100 animals. Roundworm survival is largely dependent on maintaining large numbers and the ability to rapidly adapt to a changing environment.

PREDICTED INFESTATION RATE

One of the techniques described above can be used to evaluate the current fecal egg output by the cattle herd and determine when it is economically worthwhile to deworm cattle. By using some basic principles of parasitology, guidelines can be established to categorize cattle herds by predicted roundworm burdens. Utah cattle herds can be divided into 3 broad categories based on environmental conditions these categories are: mild, moderate and heavy.

1. Mild—cattle graze on range-type areas or are fed in mangers in a corral for the entire year. The dry desert areas would seldom allow for completion of the parasite life cycle, while concentration of cattle in high mountain meadows for the full summer grazing could allow a build-up of parasites.

2. Moderate—cattle graze on wet meadow areas for any part of the year. The longer the cattle graze these areas, the greater the parasite burden that can be expected. If liver flukes are present in a herd of cattle, it would indicate that environmental conditions also favor development of roundworms, and their presence should be expected.

The majority of Utah cattle herds fall into this classification. The actual roundworm burden will vary from herd to herd, depending on a variety of specific environmental and management conditions.

3. Heavy—cattle graze on a wet meadow area the year around. During the colder months there is very little forage to graze and they may also be fed supplemental hay. This will likely provide a heavy roundworm burden for the calves born to these cows. Parasite infection would occur soon after birth and continue to increase throughout the grazing season. A 600 pound calf may lose 1 ½ pints of blood per day because of blood-sucking roundworms. This category is not common in Utah, but can occur with herds from category #2 which have other special circumstances imposed upon them.

PRINCIPLES OF MANAGEMENT

1. Pastures that are grazed in the fall and again in the spring will allow cattle to become infected with a greater roundworm burden than will pastures that are grazed in the spring and then in the fall. For stocker cattle being placed on spring grazing, try to place the cattle on a pasture that was not grazed the previous fall. Allow cattle to graze the pasture for only 1 period during the year, if possible. If possible, move the cattle in July to a pasture that was not grazed in the spring. This uses the principle of sunlight and drying to aid in decontamination of pasture areas by killing roundworm eggs and larvae.

2. Pasture rotation actually favors re-infection of cattle with roundworms unless the pasture is left idle and exposed to sunlight and drying for a period sufficiently long to destroy the infective larvae.

3. Moderate pasture stocking rates result in less roundworm infection than heavy stocking rates.

4. 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. The roundworms may survive in manure pats for up to 15 months if there has been no moisture to stimulate larval development by washing them away from the pats.

5. Never follow a group of stocker age calves with a group of sucking age calves. The pasture will likely be heavily contaminated with roundworm eggs and larvae following the stocker calves. The younger calves will be very susceptible to larval infection while grazing.

6. The encysted (inhibited) larval stages are most likely to occur in Utah in the Fall and early Winter. This period may extend for 14–18 weeks.

7. Treating subclinical parasitism at mid-season is a waste of time and money unless cattle are moved to a clean pasture immediately following treatment.

8. Alternating deworming products helps to reduce parasite resistance developing to individual drugs. Some drugs are much more likely to experience parasite resistance than are others.

9. Feedlot—Evaluate the source of the cattle and decide whether or not to deworm (at entry) based on that information. There is usually a benefit to deworming during the first 90 days. If cattle are kept beyond the 90 day limit, there is little benefit from deworming at entry. Do not neglect the possibility that encysted roundworm larvae may be present in some cattle. Remember that special products are required to remove encysted larvae.

WHAT TO USE AND WHEN

The products which are effective against roundworms are listed in Table 1. Consult with your veterinarian about your specific operation to determine when to deworm and what products to use.

Table 1. Dewormers for Cattle

Generic Name	Brand Names	Route*	Comments
Thiabendazole	TBZ	B,D,F,P	Parasite resistance is a problem No longer manufactured
Levamisole	Tramisol Ripercol Levasol Totalon	B,D,I,PO	
Ivermectin	Ivomec	I, PO	Very effective against roundworm larval & encysted stages and external parasites
Clorsulon	Curatrem	D	For liver fluke only
Combined	Ivomec Plus	I	Includes ivermectin and clorsulon
Morantel	Rumatel Nematel	B,F	
Fenbendazole	Panacur Safe-Guard	D,P,Salt	Effective against tapeworms. Some effect on encysted roundworm larvae
Albendazole	Valbazen	D	Effective against roundworms, liver fluke and tapeworms
Eprinomectin	Eprinex	PO	New, ivermectin type product

*Route of administration: B-bollet, D-drench, F-feed, I-injectable, P-paste, PO-pour-on, Salt-salt block

The following categorization can be used as a general guide and adapted to your specific situation.

1. Mild incidence of parasitism: Under normal circumstances, deworming is probably not of economic benefit. Deworm all cattle kept as replacements (at weaning) and deworm any cattle introduced onto the ranch. Ignore other animals in regard to deworming.

2. Moderate incidence of parasitism:

Cows: deworm in the Fall (or Spring) (or mid-winter to incorporate fluke control)

Calves: deworm at weaning (do the feeders only if you are keeping them or if you are getting paid by the buyer for deworming).

Stockers: deworm at weaning (or acquisition)—If stockers go onto wet meadows, deworm at 3 after turnout.

3. Heavy incidence of parasitism:

Cows:

a) deworm at 3 & 6 weeks after turnout (or the beginning of grass growth) in the spring—(can extend second deworming to 8 weeks if Ivomec was used for the first treatment)

b) deworm at weaning in the fall

Calves and Stockers: Same as cows

An alternative program would be to deworm the cows between March 15 and April 15, also all calves over 45 days of age at this time, and then deworm cows and calves between June 15 and July 15. Immediately move the cattle to a clean pasture.

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