

# Common Internal Parasites of Sheep and Goats



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# Common Internal Parasites of Sheep and Goats

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All sheep and goats are infected with internal parasites to some extent. It is difficult to measure the amount of damage they do because progressive weakness, loss of weight, impaired growth rate and general unthriftiness are difficult to measure. The loss in weight and reduced quality of wool and mohair fleeces in heavily parasitized sheep and goats are also difficult to estimate.

Actual death loss from internal parasites can be minimized by good management. Since internal parasites cannot be eliminated, good management practices are necessary for their control.

Several factors contribute to internal parasitism in sheep and goats.

1. Continuous stocking with sheep and/or goats
2. Overstocking
3. Lack of feed
4. Poor watering facilities
5. Failure to recognize the symptoms
6. Failure to follow adequate control programs

## KINDS COMMON TO TEXAS

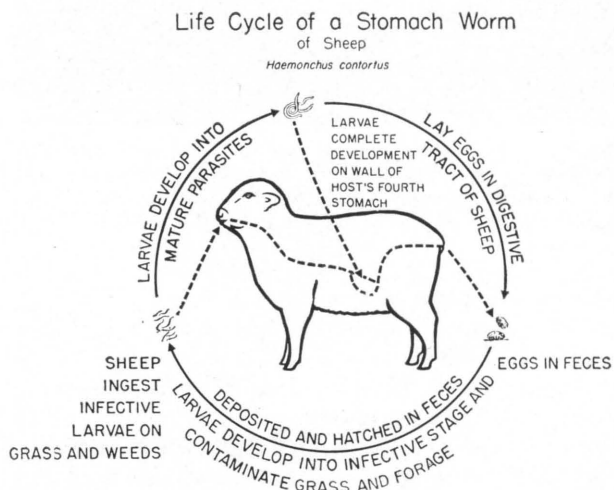
Many types of stomach and intestinal parasites affect sheep and goats. Only the ones of most economic importance to Texas sheep and goat producers are herein.

### Common Stomach Worm

The common stomach worm, *Haemonchus contortus*, is probably the most common and widespread. It is  $\frac{1}{2}$  to  $1\frac{1}{4}$  inches long and about as thick as a straight pin. This worm infects the fourth stomach of the animal.

The common stomach worm lays enormous quantities of eggs, microscopic in size, which pass out with the droppings. One "pill" of sheep or goat manure, from a heavily parasitized animal, may contain as many as 20,000 eggs.

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Under a warm, moist condition the eggs hatch and develop into infective larvae within about 5 days. Temperatures of 70 to 75 degrees and adequate moisture are ideal for the development of stomach worm larvae. Stomach worm eggs can endure long periods of drouth awaiting favorable conditions for hatching.

The larvae are extremely hardy and can exist for some time before being ingested by the host. Infective larvae are not highly mobile but move up and down on grazing plants according to the amount of moisture. The infective larvae are found near the soil and animals grazing tall grass do not pick up as many per pound of forage as the ones grazing short grass.

Infective larvae are picked up and swallowed by grazing animals. Then they usually develop to maturity in the fourth stomach within 25 to 30 days.

### Medium Stomach Worm

The medium stomach worm, *Ostertagia circumcincta*, is found also in the fourth stomach. It is small, reddish brown and hairlike in appearance. It is about  $\frac{1}{4}$  inch long. The life cycle of this parasite is similar to that of the common stomach worm. *Ostertagia* is the most common stomach worm in the Western United States.



To examine for internal parasites, force the eyelids away from the eye exposing membranes. Membranes will be pale and watery in a heavily parasitized animal. Membranes will be red and healthy in a healthy animal.

### Hair or Bankrupt Worm

An intestinal worm that has caused much concern in Texas is the hair or bankrupt worm, *Trichostrongylus colubriformis*. This parasite commonly causes a condition known as black scours. The worm is small, rarely more than  $\frac{1}{4}$  inch in length and hairlike in appearance. It may be necessary to scrape the linings of the fourth stomach or small intestine and wash this material in clear water before this parasite may be found in post mortem examination.

The life cycle of this parasite is the same as that of the common stomach worm except that shortly after infection the larvae burrow into the mucosa or lining of the small intestine. They mature within about 21 days.

### The Thread-Necked Strongyle

The thread-necked strongyle, *Nematodirus spathiger*, has been found throughout the sheep and goat raising areas of Texas and in some areas of the Edwards Plateau, the parasitism has been responsible for considerable death losses. These worms are from  $\frac{3}{4}$  to  $1\frac{1}{4}$  inches in length and the parasitic stage is found in the small intestines. Immature stages of the worm are thought to cause more damage to the host than the mature worm. In any event, when this worm is present along with other intestinal worms their damaging effects are magnified. Young sucking lambs appear to be especially susceptible to this worm infection.

### Nodular Worm

The nodular worm, *Oesophagostomum columbianum*, inhabits the large intestine and cecum. Its life cycle is also similar to that of the common stomach worm. The worm is white and from  $\frac{1}{2}$

to 1 inch long. Skin penetration by the infective larvae is possible, but infection usually is by mouth. Within 24 hours the larvae penetrate the intestinal wall where they remain 5 to 10 days and then return to the lumen as fourth-stage larvae. They mature in about 42 days.

### Hookworm

The hookworm, *Bunostomum trigonocephalum*, invades the middle portion of the small intestine. This parasite is white and from  $\frac{1}{2}$  to 1 inch long. The life cycle is similar to that of the common stomach worm except that infection may be by skin penetration as well as by mouth. It matures within about 60 days.

### Lungworms

Lungworms of sheep and goats, *Dictyocaulus filaria*, occur sporadically in Texas, especially during periods of abundant rainfall. The worms are from 2 to 4 inches in length, milky white in color and congregate in the air passages of the lungs.

Mature ewes and does are often symptomatic carriers of a few adult lungworms and these infected carriers can be a source of infection for their offspring. Lambs and kids become infected by accidentally eating infective larvae on contaminated forage. The freeliving larvae can live in a dry environment for only a few days. However, they can survive cold weather, especially when moisture is available for several months.

Signs of lungworm infection include coughing, some diarrhea, loss of appetite and in severe cases openmouth breathing. In most cases, lungworm disease is accompanied by other internal worm infections. Overcrowding can contribute to a fairly high mortality rate during an outbreak with this parasitic disease. Lambs and kids that recover from an initial lungworm infection generally are resistant to the parasites in later life.

### Large Tapeworm

The large tapeworm, *Moniezia expansa*, is found in the small intestine and may attain a length of several feet. This worm is segmented, flat, ribbon-like and white. It requires an intermediate host, a small grass mite, to complete its life cycle. The eggs of the tapeworm are eaten by the grass mite. The mites are then swallowed by the sheep or goat and mature in 5 to 6 weeks. The damage caused by the large tapeworm is not great; however, a heavy infestation may interfere with the nutrition of the host animal.

### Fringed Tapeworm

The fringed tapeworm, *Thysanosoma actinioides*, is found in the bile ducts of the liver and in the

upper part of the small intestine. This parasite is commonly 6 to 8 inches long. The fringed tapeworm is segmented, flat, ribbonlike and white. It differs from the large tapeworm because each segment is fringed; this fringe is easily seen when the parasite floats in water. The life history is not known but it is presumed to be that of the large tapeworm.

## DIAGNOSIS

Symptoms of parasitism in sheep and goats are not specific and may be confused with symptoms of other diseases. However, certain symptoms are common to all internal parasitisms—usually a lack of bloom, unthriftiness and weight loss. Some animals will develop diarrhea and an anemic condition as indicated by paleness of the mucous membranes of the eyes and mouth. Some animals may eat dirt. In advanced stages they may develop a swelling beneath the jaws, referred to as “bottle-jaw.”

Several animals showing one or more of these symptoms provide ample reason to suspect parasitism. Whenever diagnosis is doubtful, obtain the services of a veterinarian.

Fecal specimens that are to be sent to a laboratory for examination should be fresh and kept thoroughly chilled until they are mailed. Small 3-ounce waxed cartons of the type used for dispensing ice cream make satisfactory containers.

## CONTROL MEASURES

Proper grazing management and properly timed supplemental feeding are the only fully effective control measures for intestinal parasites. Drug treatment can be effective only when used in conjunction with these practices. Ranchmen can reduce parasites as a major problem in sheep and goat production by:

- Stocking pastures and ranges at a moderate level.
- Maintaining animals in a reasonable condition at all times.
- Observe animals regularly for signs of developing parasite problems.
- Immediately pen animals showing signs of parasitic disease for intensive treatment.

Overstocked range is the primary cause of most problems with intestinal parasites in sheep and goats. High population density results in a tremendous number of parasite larvae spread on the ground. When coupled with a condition where vegetation is grazed very short, this results in the



*When one person is drenching, the animal's head should be in normal position with the drench gun inserted at the side of the mouth. Shut off animal's breathing with the free hand.*

animals picking up overwhelming loads of the parasites.

In such a case, animals also are deficient in the nutrients necessary to maintain an adequate defense against parasitic invasion. On badly overcrowded range, parasites will build up to damaging levels even when the range is able to supply adequate forage. This is due to the parasitic intake finally building up to the point that it is able to overwhelm the defense mechanism of nutritionally normal animals.

Supplemental feeding, particularly with protein, during periods of dormant grass is needed to keep the animal's defense mechanism in normal working order. During stress periods, supplemental feeding of grain will assist the animal in maintaining its defense against parasitism. Supplemental feeding just prior to and following lambing and kidding is worthwhile in most years. Weaning time is another occasion that young animals are highly susceptible to parasite problems. While boosting them over the danger period of weaning, supplemental feeding at this time helps gentle them and teaches them to eat, which will be important in later management.

Sheep and goats can make excellent use of small grain pastures in fall and winter, sudan and other grass pastures in the summer and stubblefields in the fall. These supplemental grazing forms give native pastures a rest and break the continuous buildup of internal parasites.

Observe sheep and goats closely at frequent intervals. If the animals are falling off in condition, scouring or the young are not growing normally, find the cause. If internal parasites are discovered,

begin remedial action to correct the fault in management and start treatment immediately.

A specimen from an individual sheep should represent a heaping tablespoonful of droppings. Samples should be taken from at least five sheep.

A diagnosis of parasite damage cannot be made by fecal examination alone. Any diagnosis requires an examination of the animal and a good history. An animal may be parasitized and at the same time be suffering from disease or simply subjected to starvation.

In the more arid sections of Texas, a mixture of 1 pound of phenothiazine to 9 pounds of salt supplied as a lick free choice may aid in controlling internal parasites. This mixture is not strong enough to kill the adult stomach worms in the animal. Analysis of the droppings of animals that lick this mixture daily shows that a large percentage of the worm eggs passed do not hatch. In this way, the pasture buildup of infective larvae may be reduced greatly.

When phenothiazine salt is supplied as a lick, it should be the only lick available in order to get the sufficient amount of phenothiazine in the animal's system. Sheep and goats will not lick phenothiazine salt if they have access to plain salt. Even under ideal conditions, phenothiazine salt is not an effective control measure.

Phenothiazine and salt, free choice, should be combined with good management practices and individual treatment for good control, particularly in humid areas.

Do not mix copper sulfate or bluestone with salt for a low-level lick. Such a mixture is ineffective and may result in *chronic copper poisoning*.



Automatic drench gun is used here. Bag holds about 1 gallon of drench. Amount of dosage is controlled by adjusting the trigger.

## DRENCHING TECHNIQUE

A proper drenching technique is necessary for favorable results. Too often, persons administering the drench are more interested in the number of animals drenched per hour rather than how well the job is done.

A drench gun that does not leak and measures the correct dosage accurately is necessary for a good job and insures minimum loss of solution.

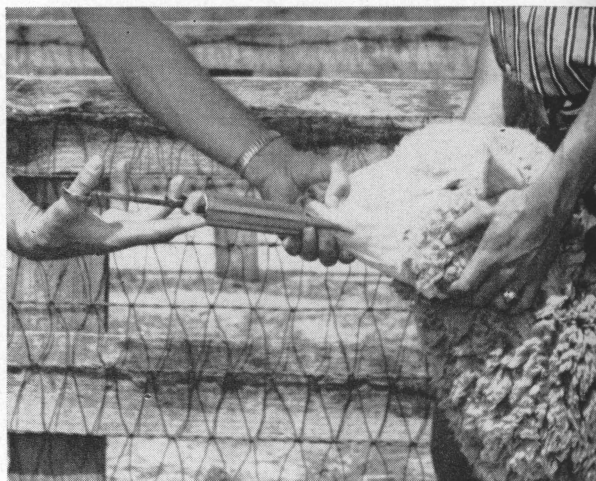
A small piece of rubber tubing placed on the nozzle of the drench gun will help prevent injury to the membranes of the mouth and throat.

When only one man does the drenching, he should straddle the animal just back of the head. A drench gun is inserted at the side of the mouth, closing off the breathing with the other hand and pushing the plunger. Breathing is prevented until the animal swallows. The animal's head is kept in a normal position so that he may swallow easily. Tilting the chin too high may cause difficulty in swallowing and may force some of the drench into the lungs.

When two men work together, one man holds the animal by straddling it and takes a firm hold on the head. The other man handles the drench gun. When the drench gun is inserted in the mouth, the man holding the animal shuts off its breathing until the solution is swallowed.

When inserting the drench gun into the animal's mouth, be careful not to force it into the membranes of the mouth and throat.

When the drench gun is placed in the mouth so that the animal can bite down on it with its incisor teeth, it is not possible to close the mouth and more drench is lost.



With two persons doing the drenching, one holds the animal and the other works the drench gun and shuts off breathing until animal swallows.



*A piece of rubber tubing on the nozzle of the drench gun protects the animal from injury in case the animal lurches against it.*



*Holding the animal's head up makes swallowing difficult and may force drench into the lungs. Drench gun inserted in front of mouth permits animal to spit out drench.*

## TREATMENT

Increasing the dosage may be dangerous to the animal, as well as expensive. All drenches are poisonous and should be administered according to directions of the manufacturer.

Instructions and cautions on the label of all drugs must be followed exactly or serious loss may occur. Phenothiazine should not be given to pregnant animals the last 45 days of pregnancy because abortions may result.

Tramisol is one of the newer drugs for treating sheep and goats. It is available as a drench and also in bolus form. In the drench it forms a clear solution and requires a tighter fitting drench gun than is used for those materials in suspension. The manufacturers claim tramisol is effective in the control of the adult forms of the common stomach worm, medium stomach worm, hairworm or bankrupt worm, nodular worm, hookworm, nematodirus, cooperia and lungworm. Claims to the effectiveness against immature stages of these parasites are made also.

One packet of Tramisol (46.8 grams) can be mixed with 1 gallon of water (128 fluid ounces) and administered at the rate of 1 ounce per 100 pounds of body weight. This amounts to 0.36 grams per 100 pounds.

Tramisol does not stain the wool and apparently is not harmful when it comes in contact with the skin.

Thibenzole is also available in the bolus and drench forms. In the drench form it goes into a suspension and does not form a clear solution.

The manufacturer claims it is effective against the common stomach worm, the hairworm or bankrupt worm, medium stomach worm and cooperia. It has been most effective against hairworm or bankrupt worm infestations in goats.

One packet of Thibenzole (108 grams) is mixed with 1 quart (32 fluid ounces) water and is administered at the rate of 1 fluid ounce per 100 pounds of body weight for routine worming. The dosage is increased to 1½ ounce per 100 pounds of body weight for cases of severe parasitism.

Thibenzole does not stain the wool and apparently does not irritate the skin.

Loxon, another of the newer drench materials, is available as a drench only. It is an organophosphorus compound and cannot be used with any drug, insecticide, pesticide or other chemical having cholinesterase-inhibiting activity either simultaneously or a few days before or after treatment. The cholinesterase-inhibiting chemicals are notably the organophosphorus compounds used for external parasite control.

Loxon is mixed at the rate of one packet (52 grams) with 32 fluid ounces of water, making a total of 33 fluid ounces. Animals weighing 50-90 pounds are given 1 ounce and those weighing 90-150 pounds are given 1½ ounces.

Phenothiazine is a popular drench with sheep and goat producers. It may be administered as a drench or as a bolus. The recommended dosage should be given. The drench should not be diluted for greater ease in administering because the consistency of the drench adds to the safety in administering.

Animals need not be starved before or after administering phenothiazine. The usual dosage for ready-mixed phenothiazine drench is 2 ounces for adult sheep or goats and 1 ounce for lambs and kids. Directions on the container always should be followed.

Phenothiazine is effective against the common stomach worm and the nodular worm and to a lesser degree against the medium stomach worm, hair worm or bankrupt worm and hook worm. In the case of the hairworm, it may be necessary to drench several times at intervals of 18 to 21 days. Taking the animals off pasture and feeding them breaks the cycle of the hairworm and supplemental feeding helps the animals build up resistance to this parasite. The animals should be fed until there is a noticeable improvement in condition.

When phenothiazine is fed at a low level, parasites may develop a resistance to the drug. When parasites appear to have developed a resistance to phenothiazine, use another treatment.

Phenothiazine stains wool a reddish color upon contact. It produces a reddish color urine that also stains wool upon contact. For this reason

animals should be turned out to pasture as quickly as possible to avoid excessive staining of the wool.

Precautions should be taken against getting phenothiazine on the skin. Wearing long sleeves, gloves, a handkerchief tied over the nose and mouth or an inhalator will give some protection. Drenching in the shade is also helpful. Some individuals are so sensitive to this chemical they are unable to work with it.

### MANAGEMENT CONTROL MEASURES

Practice the following for effective internal parasite control.

- Stock pastures and ranges at a moderate level.
- Maintain animals in strong physical condition at all times.
- Observe animals regularly for signs of internal parasitism.
- Confine and treat animals showing heavy parasitism.