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STOMACH WORMS IN SHEEP

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The common stomach worm, technically known as *Haemonchus contortus,* is a limiting factor in sheep production in Kentucky and other lamb-producing states. These worms affect sheep of all ages but are particularly severe on lambs. While many lambs die from stomach worms every year, the financial loss from the death of these is small when compared with the loss resulting from the sale of thousands of thin, light lambs marketed in the late summer and early fall for several dollars per head less than they would have brought had they been kept free from worms. Practice of the control measures set forth in this circular will prevent this loss almost entirely.

LIFE HISTORY AND SOURCE OF INFESTATION

Adult stomach worms live only in the fourth stomach of sheep, cattle and goats. The female worm lays eggs, microscopic in size, which pass out with the feces and are deposited on the ground, where they hatch into very small worms in a few hours to several days, depending on conditions of temperature and moisture. Continued dry or freezing weather kills the eggs or the worms in this stage. Under favorable conditions of warmth and moisture, however, they develop into the active or ensheathed stage. In this stage the worms become attached to moist blades of grass and may be taken with the grass into the sheep's stomach, where they continue their development and reach maturity in eighteen to twenty-five days. In the ensheathed stage, the worms may survive dry or freezing weather for weeks or even months; hence an infested pasture may remain so for a considerable time, even in cold or dry weather.

While sheep usually get stomach worms with the grass they eat, the worms may be taken in with drinking water from ponds and pools in infested areas. Moist earth at the edge of a pond is ideal for the development of the eggs.

SYMPTOMS AND DIAGNOSIS

Dullness and lack of thrift are among the first symptoms of stomach-worm infestation. The skin loses its pink color, becomes pale and the mouth and eyelids present a pale appearance due to an impoverished condition of the blood. Diarrhea, tho not always present, even in sheep heavily infested, usually sets in when the animal is affected to any great extent. This is often the first indication to the farmer that his flock is wormy. In severe cases the sheep may become emaciated and die. "Bottle jaw," a watery swelling under the jaw, caused by the anemic condition of the blood, often is found in advanced cases of stomach-worm infestation.

Stomach worms are more fatal to lambs than to older sheep. Usually, in Kentucky, they affect lambs by late spring or early summer and often the trouble is not detected until several lambs have died.

CONTROL MEASURES

Efficient control of stomach worms in sheep under Kentucky conditions requires both preventive measures and medical treatment.

Preventive measures:

1. Breed ewes for early lambing so as to get the lambs on the market before stomach worms have had a chance to affect their market value.

2. Avoid contaminated pastures as far as possible, at least until the lambs are ready for market.

3. Provide as much rotation of pastures as possible and make liberal use of temporary pastures during the hot weather.

4. Do not overcrowd. Better have too few sheep than too many.

Medical treatment:

1. Treat the whole flock with a reliable vermifuge in late fall so that the sheep go into the winter comparatively free from worms.

2. Treat all sheep again, except the lambs, in the early spring, after lambing.

3. Treat the sheep regularly every month thereafter until fall.

4. Treat any lambs that will not be ready for market by the middle of June, when they are eight or ten weeks old and monthly thereafter until marketed.

Among the vermifuges that are used successfully in the control of stomach worms in sheep the following are recommended: (1) copper sulfate, (2) a mixture of copper sulfate and nicotine sulfate and (3) tetrachlorethylene. The copper sulfate and the combined treatment are generally administered in the form of drenches while tetrachlorethylene is usually administered in capsules.

THE COPPER SULFATE TREATMENT

The copper sulfate treatment was first used in South Africa about 1880 and has been used successfully ever since.

Preparation. Dissolve one-fourth pound (avoirdupois) of powdered crystals of copper sulfate (bluestone) in one pint of boiling water, then add enough cold water to make three gallons of solution. This makes approximately a one-percent solution and is enough to dose 100 adult sheep. Only clear, blue crystals of copper sulfate should be used in the preparation of this solution. The crystals should be crushed to a fine powder so that they dissolve more readily. Only wooden, earthenware or other non-metallic receptacles should be used, as bluestone corrodes most metals.

Caution. Have the solution the right strength. An overdose may kill the sheep whereas less than the amount recommended may not kill the worms.

The Right Dose. Adult sheep, 3 to 4 ounces (90 to 120 cubic centimeters) of the solution.

Lambs two to six months of age, 1 to 2 ounces (30 to 60 cubic centimeters).

Lambs six months to one year of age, 2 to 3 ounces (60 to 90 cubic centimeters).

PREPARING SHEEP FOR TREATMENT

Best results are obtained when food and water are kept away from the sheep for at least twelve hours before and four hours after treatment. A good plan is to put the sheep up at night, give the treatment the next morning and give them no water or food until noon.

CORRECT POSITION IN DRENCHING

To make handling easier, the sheep should be backed into a close place such as the corner of a shed or fence. The animal should stand in a natural position, all four feet on the ground and the nose on a level with the eyes. If the head is raised too high, part of the liquid may pour into the lungs which may cause pneumonia and death. The attendant should stand astride the sheep.

Drenching with Bottle. If the flock is small, say 25 to 50 head, a bottle may be used for drenching. A six-ounce soda water bottle is satisfactory.

The Drenching Tube. If many sheep are to be drenched, time may be saved by using a drenching tube. Attach a three-foot rubber tube, one-half inch in diameter to the wall. Attach a funnel to the top of the tube and on the lower end insert a piece of copper or brass tubing about six inches long so that the sheep cannot chew the rubber.

The Syringe. Many sheepmen prefer to use a syringe. A 4-ounce syringe made especially for drenching is very satisfactory.

THE COMBINED TREATMENT

A solution of copper sulfate and nicotine sulfate, when properly prepared and administered, is as efficient as the bluestone solution for the elimination of stomach worms in sheep and has the advantage of a fair degree of efficiency in expelling tapeworms. This combined treatment is recommended where sheep are suffering from both stomach worms and tapeworms. For the combined copper sulfate and nicotine sulfate treatment, first, prepare a one-per-cent copper sulfate solution as previously recommended, then add to each gallon of this solution one fluid ounce of a 40-percent solution of nicotine sulfate. This combined solution should contain the same

amount of copper sulfate as if that alone were being used. The dosage per sheep for the combined treatment is the same as that previously recommended for copper sulfate treatment.

TETRACHLORETHYLENE

Tetrachlorethylene has shown a high degree of efficiency in the elimination of stomach worms in sheep. It is effective on some varieties of worms found in Kentucky sheep which cannot be eliminated with bluestone. Also some sheep that do not respond to bluestone may be successfully treated with tetrachlorethylene. It is administered in capsules which are manufactered in two sizes, the larger for an adult sheep and the smaller for a lamb. The capsule for an adult sheep contaíns five cubic centimeters of tetrachlorethylene and that for a lamb, two and one-half cubic centimeters. Many Kentucky farmers prefer the tetrachlorethylene treatment. The principal disadvantage is the cost which is about five cents per treatment for mature sheep and two and one-half cents for lambs. Tetrachlorethylene capsules can be obtained from most druggists. Only the chemically pure product as put up by reliable firms should be used.

CHANGE OF PASTURE

A rotation which permits changing the flock to a clean pasture every two weeks without going over the same field twice during the year would largely prevent losses from stomach worms. Feeding in dry lots would do the same thing. However, such systems are seldom practical under Kentucky conditions so the best plan is to provide as good a system of pasture rotation as the system of farming permits and resort to medical treatments. Hay fields, grain stubble, corn fields and forage crops may be used in the rotation.