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A Preliminary Report on the Fringed Tape Worm of Sheep

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South Dakota Agricultural College
EXPERIMENT STATION



A PRELIMINARY REPORT

— ON THE —

Fringed Tape Worm of Sheep

DEPARTMENT OF VETERINARY MEDICINE
BROOKINGS, SOUTH DAKOTA

1903
NEWS PRINTING CO.
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Any farmer of the state can have the Bulletins of this Station free upon application to the Director.

A PRELIMINARY REPORT ON THE FRINGED TAPE- WORM OF SHEEP

(*Thysanosoma fimbriata*)

E. L. Moore, Veterinarian

The increased number of inquiries received lead to the belief that a preliminary report setting forth our present knowledge of this parasite would be of value. While our record of autopsies shows that the fringed tapeworm of the intestines frequently inhabits the same individual, as the twisted stomach worm, it is to the former alone we desire to call attention.

An adult worm measures from 15 to 30 cm. (5 15-16 to 11 7-8 in.) in length. In comparison with other species of tapeworm the head is large, about the size of a pin's head, and provided with four distinct suckers. For the purpose of this report it is deemed neither advisable nor essential to enter into a minute description of the structure of this parasite.

The possession of one peculiar and characteristic feature permits of the ready identification of the fringed tapeworm. The posterior border of each segment of the worm bears a fringe, giving a velvety appearance to the entire animal. If there is any doubt as to the identification, the presence of this fringe can be readily recognized by placing the worm in a small vial of water, thus causing the fringe to float out somewhat from the segments of the body.

Distribution, Mortality and Occurrence—The tapeworm has been found by Natterer in species of deer in South America. In sheep it is reported from Colorado, Utah, Nebraska (Curtice); New Mexico (Cadweiss, Curtice); California, Oregon, Utah (Curtice); Missouri (Stewart, Curtice); Washington, D. C. [in sheep from Colorado (Hassall and Stiles)]. In our own state it is quite generally distributed. The first time

its occurrence was noted was in connection with some autopsies conducted upon sheep on the College farm. Since then we have met with the parasites more frequently and in other localities. It is of interest to note, however, that for the past two years we have not been able to find this particular tapeworm in any autopsies conducted on the College sheep. It has been found in various flocks in the vicinity of Brookings and in different portions of the state. But there has been no opportunity for making a systematic examination in order to accurately determine its occurrence and distribution in this state. The largest infestation found was seventy-five distinct worms in one animal. The greatest mortality recorded from one flock was twenty-five per cent. In explanation of this seemingly high death rate it might be stated that this flock was wintered with but little, if any, grain, being turned out on the range during the day to pick for a living and housed in the barn at night. Although it is undoubtedly true, had the sheep been grained, the mortality would have been less, it is equally true that had the sheep not been infested with the fringed tapeworm, they would have wintered, as do many similarly cared for, without serious loss. The lack of grain and the presence of the parasite proved disastrous.

Experience shows that even in the best cared for flocks the mortality may run high, and there is truth in the statement of Curtice that "it forms at times a veritable scourge to the sheep industry of the western plains."

In the majority of cases this tapeworm is found in the duodenum or first portion of the small intestine. Not infrequently, however, they may be found in the common bile duct from the liver, and also in some cases in the hepatic ducts. Curtice states sometimes they may be found in the ducts of the pancreas, believing that they enter these various channels while young.

Life History—The exact life history of the fringed tapeworm is unknown. Curtice's experiments in attempting to infest young lambs directly with eggs from the fringed tapeworm proved negative, which suggests that, like many other

tapeworms, it must pass through some intermediate host or hosts. Yet this is merely conjecture and, as above stated, its life history has not been fully determined.

Symptoms—The attention of the owner is probably first attracted to the disease by the fact that lambs which should be doing well are unthrifty, scour and soon begin to gradually die. A more careful examination will show that the mucous membranes of the eyes are pale and bloodless; and, as the animal becomes more seriously affected, it appears thin and emaciated, and the skin hide-bound. Soft swellings appear under the throat or in the neighborhood of the neck, owing to the serous extravasations; the gait becomes feeble, the body under-sized, and the head often large. The appearance of being foolish and the difficulty in vision, to which Curtice calls attention, we have not noticed. A microscopical examination of the blood shows a large increase in the number of leucocytes. Altogether the picture, therefore, is one of cachexia or malnutrition, and so far as symptoms are concerned there is absolutely nothing which serves to diagnose this from any other of the parasitic diseases of sheep. A positive diagnosis can only be made by conducting a post mortem examination and recognizing, in the manner already indicated, the presence of the fringed tapeworm.

Prevention—While practical efforts to prevent parasitic diseases depend upon a complete knowledge of the parasite's life history, and although no established rules can be given, nevertheless, this does not minimize the importance of providing sheep with a rotation of pastures. No disease results in greater mortality among sheep in the United States than those of parasitic origin. By running sheep over the same ground, year after year, we are courting the infestation and re-infestation of each individual in the flock. As a general rule in the prevention of most parasitic diseases, there can be no question of the utility of occasionally providing fresh pastures over which no sheep have ranged for at least one year. The selection of high, sloping ground for a pasture is advisable whenever possible. The animals should be watered

from tanks raised above the ground so that the water does not become contaminated with their droppings. The fencing off of sloughs, ponds and stagnant pools is also very important in preventing infection. The burning over of the pasture will destroy the eggs and young worms on the grass, or on the droppings. As this malady is more fatal in the young animal, a liberal supply of grain will assist in tiding it over and furnish vitality to withstand the disease. They should have free access to salt at all times.

Treatment—During the past few years, as opportunities have been offered, various modes of treatment have been used, including kamala, kousso, etherial extract of male fern, picric acid, copper sulphate, etc., as well as some proprietary compounds bought in the open market. While not recommended as the best, nor as an ideal form of treatment, nothing has proved so uniformly satisfactory as Hutcheson's method with copper sulphate. Our experience with this form of treatment is, therefore, at variance with the results obtained by Stiles.

We are indebted to Bulletin No. 19 of the Bureau of Animal Industry for the following description of the Hutcheson method of treatment:

(a) To prepare the mixture dissolve one pound avoirdupois of good commercial powdered blue stone, sulphate of copper, in two imperial quarts (2 2-5 U. S. qts.) of boiling water. When the blue stone is thoroughly dissolved, add 6 1-2 imperial gallons (7 4-5 U. S. gals. or 31 1-5 U. S. qts.) of cold water, making in all 7 imperial gallons (8 2-5 U. S. gals.) of water. Use only blue stone of a uniformly blue color. Avoid that which is in conglomerate lumps with white patches and covered with a white crust. * * * The owner is cautioned against guessing at the weights and measures, for this is sure to result in too strong a solution, which will kill his animal, or too weak a solution, which will fail to be effective. If a smaller quantity than the above is desired it can be made up on the proportion of one ounce of copper sulphate to two quarts of water.

(b) **Preparation of the Animal**—Fast the sheep twenty to twenty-four hours before dosing.

(c) **Size of Dose**—

Age of Animal	Tablespoonsful	Fluid Ounces
For a lamb 3 months old.....	1	2-3
For a lamb 6 months old.....	2	1 1-3
For a sheep 1 year old.....	3	2
For a sheep 1½ years old.....	4	2 2-3
For a sheep 2 years old and over.....	4¼	3

The doses should be measured off in bottles plainly marked with a file, to serve as a graduate.

(d) **Dosing**—While a drenching tube is more satisfactory, the popular method of drenching is with a long necked bottle. The assistant places the sheep on its haunches, taking its forelegs in the left hand and steadying the head with the right hand. The bottle is then inserted in the sheep's mouth and the solution slowly poured down to prevent choking. For the same reason do not raise the nose above the height of the eyes. In this connection it is of interest to note the results obtained by Stiles in drenching sheep in different positions. If the animal was drenched while standing, almost the entire quantity of the dose went into the fourth or true stomach. If it was placed on its haunches, the fluid passed partly into the fourth stomach and partly into the first. If it was placed on its back, almost the entire dose passed into the first stomach or paunch. These tapeworms being found principally in the intestines, it is quite evident from Stiles' experiments in drenching that the most favorable results are to be expected by drenching the animal in a standing position, inasmuch as that portion of the dose which otherwise passes into the other compartments of the stomach is largely lost. But the most usual method of drenching is as already described.

(e) **Overdose**—If after dosing, any of the sheep seem to be suffering from an over dose, indicated by lying apart from the flock, not feeding, manifesting a painful excited look and a spasmodic movement in its running, walking with a stiff

gait, or purging with a dirty brownish discharge, take the affected animal from the flock to a shady place and dose with laudanum and milk. For a lamb four to six months old give a teaspoonful of laudanum in a tumbler of milk. Repeat half the dose in two or three hours if necessary.

(f) **After Treatment**—The animals should not be allowed water for several hours after receiving the copper sulphate.

This method of treatment has been followed not only by us personally, but in answer to inquiries it has been recommended during the past two years. So far as information could be obtained the results have been most successful. Of course no treatment succeeds where an animal is already so badly infested as to show marked weakness and emaciation. We have yet to record fatalities from this method of treatment, although some farmers have used larger doses or made a stronger solution than has been recommended. It cannot, however, be too emphatically stated that he who modifies either the size of the dose or the strength of the solution is taking his own risks and at the expense of the flock.

The practice of simply treating those animals in the flock that begin to show signs of parasitism is hardly worthy of notice. The entire flock should be treated at the same time, for while other sheep may be able to withstand the presence of the parasites, they serve as a source of infection. While the tapeworms are being voided the flock should be confined to one place, the droppings with the segments of worms collected and destroyed or removed to a place to which the sheep do not have access, to guard against a recurrence of this disease.