

Five Kinds of Worms Make Internal Troubles of Our Sheep and Goats in Valley

The Oregon State Agricultural College Experts Have Made Investigations and Issued a Bulletin; They Have Found Ways to Control the Trouble

John C. Burtner of the department of industrial journalism of the Oregon State Agricultural college furnishes the following very important information for sheep and goat breeders in the Willamette valley, for this annual sheep Sloan number of The Statesman:

With the rapid growth in numbers of farm flocks of sheep in western Oregon which have been proving highly profitable in recent years, one of the major problems developing is that of control of internal parasites. So serious has this trouble become that extensive work was undertaken by the department of veterinary medicine at the Oregon State college experimental station, where considerable original research work has been carried out with marked success.

While the studies are not yet complete, so much valuable information has accumulated that it has recently been published as scours circular No. 93, entitled "Scours in Sheep and Goats in Oregon," by Dr. J. N. Shaw.

The most serious of the intestinal worms which cause scours in Oregon sheep and goats are killed through proper treatment, the experiment station workers found, and methods were devised which make control of losses from scours both practicable and economical.

Due to Parasites

"Every serious outbreak of scours in sheep and goats which has been observed by the department of veterinary medicine of the Oregon agricultural experiment station has been caused by parasites of some type," says Dr. Shaw in the circular.

"There are found in the digestive organs of sheep and goats in Oregon a large number of different kinds of worms. At least five groups of these seem to cause scours. Four of these groups are threadworms, while the fifth is a flatworm.

"Usually the first symptom of infestation with threadworms is loss of flesh. Regardless of the type of feed, infested lambs and kids fail to make proper growth. As the loss of flesh progresses the bowels are disturbed and scours usually appear. In some instances mature sheep do not develop scours until a day or two before death occurs. In most affected bands several animals will show symptoms at about the same time.

"After scours becomes severe a swelling, which is variously known as water ball, wattle, or bottle jaw, may appear under the jaw.

Treatment Important

"The affected animals may die within a week or ten days after the appearance of scours or they may live for several weeks. The appetite usually remains good until a day or two before death occurs. If infestation is not too severe and the animals are well fed, some may gradually recover. Under average conditions, however, more than half those which develop scours die unless they are treated.

"While losses from threadworms may take place at any season, most outbreaks of the trouble appear after the first fall rains and continue until spring.

"Examination of winter lambs less than two months old have shown that threadworm infestation may take place in western Oregon even in the winter. Infested sheep and goats pass eggs at all seasons, too. It is known that the embryos of the various threadworm will live several months. Any successful control measures must be based upon these facts.

Two Ways of Control

"Two methods of control are possible. One is to prevent the contamination of pastures, corrals, yards and barns with the droppings of sheep and goats containing these worm eggs. This is done through treatment of the animals at regular intervals. The other method is to prevent any susceptible sheep or goat from becoming infested through using any infested pastures, corrals, and barns. On many ranches the most practicable control method is a combination of these two. In bands which are badly infested the tetrachloroethene treatment should be repeated every week until three or four doses have been given. After this it is generally necessary to treat only those animals which show symptoms. Sheep and goats not showing symptoms but running on infested pastures should be treated at least twice each fall—first about the time of the first fall rains, and second about a month later. If possible, some temporary pasture or cultivated ground should be provided, especially for lambs and kids. Pastures which are badly infested may be either plowed up or used for other livestock than sheep and goats. The manure from sheep and goat corrals should not be used on cultivated land which is to be grazed by these animals.

"Flatworms or liver-flukes are frequently spoken of as leeches. They are flat worms shaped somewhat like a cherry leaf. They

average about two-thirds of an inch long and about half that wide. They are of a somewhat brownish color. The mature flukes are found in the gall bladders and bile ducts of the livers of infested animals.

"Their life histories are very complex. Each fluke contains both male and female organs, and consequently is capable of laying eggs. It has been claimed that a single fluke can produce up to 50,000 eggs. These eggs pass into the intestine along with the bile and then escape from the bowels with the dung.

"Eggs which are kept in water may hatch in from two to sixteen weeks, or possibly even longer. The young embryos, upon escaping from the eggs, swim very rapidly. They die in a few hours unless they find a suitable snail to attack. In Oregon the only snail so far found to be attacked by these embryos is a small one up to one-third of an inch long, which lives in sluggish streams, small bodies of still water, and damp marshy places. After entering a suitable snail the young fluke changes its form several times before it comes out. Thus an embryo entering a snail may result in a thousand young flukes leaving it. The young flukes have long tails when they emerge from the snail. They swim very vigorously for a short time. In a few hours, however, the tails are lost and the parasites encyst on some convenient object such as a grass leaf. These cysts are so small they can scarcely be seen with the naked eye. When they are taken in with food or water the flukes escape burrow through the intestinal wall, crawl around in the abdominal cavity until they reach the liver, and then pass into this organ by penetrating the capsule. They wander around in the liver tissue for five or six weeks, gradually increasing in size. As they approach maturity they pass into the bile ducts where they remain for several months, producing a large number of eggs.

"Guinea pigs and rabbits, as well as sheep, have been experimentally infested by feeding them with material from snails from fluke-infested pastures.

"There are three possible methods of control and eradication of flukes on a ranch. These are (1) the treatment of all fluke-infested animals at regular intervals in order to prevent infestation of pastures with fluke eggs, (2) the destruction of all snails which act as secondary hosts for liver flukes, and (3) the fencing of all snail-infested areas so that sheep, cattle, and goats can not pasture on them.

"Studies at this station have shown that mature flukes may be found in western Oregon sheep and goats every month in the year and that immature flukes may be found in them from June until February. These facts prove the danger of pasture infestation at any time unless treatment is given regularly to fluke-infested animals. The cost of carbon tetrachloride is low that repeated treatments can be given economically. Studies already made indicate that the interval of time between treatments should not be more than three to four weeks.

"Destruction of snails may be accomplished in two ways. One is through draining all marshy lands so that the snails will not find satisfactory living conditions. This is impracticable on most of the fluke-infested farms of western Oregon. The other is through the use of copper sulfate to poison the snails. This is a cheap and satisfactory method of destroying snails. In trials conducted at this station powder of copper sulfate was mixed with land plaster at the rate of one pound of bluestone to eight of land plaster and this was broadcast on all wet areas where the snail in question occurred. Application of this mixture at the rate of about 270 pounds to the acre resulted in the destruction of from 95 to 99 per cent of the snails present. Rather limited experiments in grazing sheep on pastures which had been treated at the rate of 540 pounds per acre, or twice the amount recommended indicated that these animals will not be poisoned if left on such pastures following treatment.

"These snails produce at least two broods a year, one in the spring and another in the fall. It seems advisable to treat pastures after the first warm spell in the spring has brought the snails out and before the first eggs are laid. Cost of treating pastures should not exceed five dollars per acre. The combination of regular treatment of all fluke-infested animals and the destruction of snails by poisoning is of expensive.

More Than Dollar for Dollar

Mr. Kay said a year ago that could buy ewes for \$12 a head, and most of them will produce two lambs. Take 100 ewes, and count the increase at 150 lambs, selling at \$9 each, and you have \$1350, and the wool will sell at \$300 to \$350. So you have \$1650 to \$1700 gross for your investment of \$1200. "Can you beat that?" asks Mr. Kay.

He was for a long time interested in a 400 acre farm north of Turner, and he had 100 head of sheep, and they paid more profit than all the rest of the products of the farm, year after year, more net profit. Wool was then selling at around 35 cents a pound. It has often been higher since, and the lambs are higher than he were then. The wool from ordinary sheep here runs from eight to 10 pounds a head, and from the Cotswold type to 10 to 11 pounds; though the Cotswold fleeces brings about five cents less a pound than that from the Shropshire type, and the mutton of the Cotswold is not as good as that of the Shropshire. It is coarser.

Should Have More Sheep

Mr. Kay thinks we should have many more sheep in the Salem district. The United States has been producing about 300,000,000 pounds of wool a year, and importing about 350,000,000 pounds annually. Our country ought to produce all the wool it uses, he thinks. He believes there is no farm in the Willamette valley that can make room for sheep that should be without them. Wool is protected by a heavy duty, and the present tariff bill proposes to increase it.

The indirect benefits of sheep breeding are nearly as great as the direct, in this valley.

Sheep will help keep your land both clean and fertile. With the addition of goats, these advantages can be increased.

We will not have too many sheep as long as the United States imports half its wool, or any of it.

The sheep industry here is growing. Keep it growing.

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TOM KAY CONTENTS WOOL IS VELVET

Thinks Our Farmers Should Keep on Keeping More and More Sheep

If Hon. T. B. Kay were in Salem instead of on his homeward way from a trip to Europe, he would tell the Sloan man to advise our farmers to keep on keeping more and more sheep. He would be good authority. He commenced working in his father's woolen mill when he was nine; he has been connected with the industry ever since. He has been in charge of the Kay woolen mill in Salem for 29 years, and he has bought a mountain of wool in that time, and has been interested directly and indirectly in the production of wool.

Mr. Kay has said often in talking before commercial bodies and in interviews with newspaper writers that sheep are better than hogs; that sheep come to market here in the Willamette valley without feeding, while hogs come with half their value consumed in the feed they must have to render them marketable. There is therefore more profit to the breeder in sheep for mutton than in hogs for pork. And the wool of the sheep is all "velvet," considered for the purpose of this comparison.

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Keep Still More Sheep

"A FLOCK of sheep on every farm and a registered ram at the head of every flock," is a worthy slogan for this valley.

Henry Porter, veteran breeder of Aumsville, says you can make more than 100 per cent on sheep, under certain conditions, here in the Willamette valley. How many other lines promise as much?

State Treasurer Kay says sheep are more profitable here than hogs, not counting the wool, which is velvet.

We have 140 weeds in Oregon; sheep will eat 120 of them, and turn them into cast. Sheep and goats will kill Canada thistle.

Karl Steiwer says it is cheaper to rent land in this valley for sheep than to pay the high herding costs in eastern Oregon.

Sheep breeding will not be overdone in the Salem district as long as the United States imports over half her wool; as long as our people eat only about six pounds of mutton per capita annually, while they eat 60 to 70 pounds of pork and beef. We might keep 100 sheep here in the Willamette valley, on our well cultivated farms and our slacker and idle acres, for every one we now have, and still not be doing more than our share towards making the United States self sufficient in wool and mutton.

SHEEP BREEDING GOOD FOR VALLEY

Numerous Successful Farmers Testify to Its Value to the District

The Salem district is increasing in the sheep breeding industry. This is well. There is room for a great deal more growth; and still better attention to the requirements of success in that line.

Karl Steiwer, brother of United States Senator Fred Steiwer, is one of our principal breeders. He says all sheep are good. He has pure bred Oxford. But he deals in many kinds, and keeps several other breeds. He says it pays to rent land at 15 cents a sheep a month, better than to pay high salaries for herding under eastern Oregon conditions. He believes there should be constant breeding up—that we should keep better sheep, as well as more of them. He says farmers should not keep scrub lambs for breeding. Mr. Steiwer is also an advocate of fewer and better dogs. He is against the sheep killing kind.

S. E. Purvine, manager of the Clifford W. Brown estate wool buying firm, Salem, says the sheep industry "is absolutely the best basis of business for the av-

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