

# Canterbury Chamber of Commerce

## Agricultural Bulletin

# Lamb and Hogget Mortality from Worms

## The Economics of Preventive Treatment

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The period immediately before and after weaning is often attended with a number of losses of lambs, and although many factors may be responsible, yet the three chief causes which influence the mortality are: shortage of food, the loss of the mother's milk, and the presence of worms in the stomach and bowels and lungs. The development in a flock of lambs or hoggets of gradual or rapid loss of condition, persistent diarrhoea, coughing, etc., and deaths invariably suggests the presence of worm infestation of the flock, if the trouble is widespread. The importance, however, of a proper classification of different diseases should not be lost sight of, since the object of this bulletin is an elucidation of the economics of regular preventive treatment for parasitic gastritis, and, incidentally, lungworm disease (hoose) of lambs and hoggets.

### The Losses Involved.

If worm-infested sheep are present to begin with, then heavier stocking will probably cause an increased infestation. Before the best results can be obtained from intensive agriculture, efficient drainage and ample reserve of food are essential, and therein lie two factors of considerable significance in the control of worm parasites. Old, low-lying, damp pastures favour parasites.

The presence in the stomach and bowels of many blood-sucking parasites entails the consumption of large quantities of food materials which would otherwise be available for the needs of the host. Furthermore, irritation of the lining membrane of the alimentary canal predisposes to lowered vitality, bacterial infection, and disease.

The incidence of losses by deaths and by reduction in wool and carcase bears a close relationship to the available feed: the less the food supply, the greater being the effects of parasites; and although regular medicinal treatment for worms with reliable drugs is

usually followed by marked improvement in health and condition, the significance of an ample food supply for stock reared on worm-infested pasturage must always be considered along with treatment.

In order that each sheepfarmer may estimate the value of preventive treatment, he must first of all calculate not only his losses in deaths, but, what is more important, his loss in weight of carcase, in wool, and in sickness generally.

### Diseases Involved.

(a) Worms affecting stomach and bowels.

Although some of the phases of the life histories of the different worm parasites of sheep remain somewhat obscure, nevertheless it has been definitely established that a period of about 24-28 days is necessary under favourable conditions of temperature and moisture for the completion of their life cycles. Hence the necessity for repeating any treatment given once a month. Heavily-infested lambs may show symptoms of debility and severe scouring as early as 20 days following the ingestion of badly-contaminated pastures. Lambs, therefore, reared on worm-contaminated pastures are often infested long before weaning time.

(b) Worms affecting the lungs.

The lung worms that affect sheep, and produce coughing, when once established in the substance of the lungs, are so situated that medicines capable of destroying them would likewise destroy the lung tissue and the animal. It is believed, however, that the immature worms on their way to the lungs pursue a tortuous course via the alimentary canal of the host. These larvæ are somewhat susceptible to the action of bluestone solution, and herein lies a factor of considerable practical importance in the prevention and control of lungworm disease. Frequently sheep are infested with stomach and lung worms at the same time, but it

has been shown that if the stomach worms are regularly treated, death seldom follows lungworm infestation. But if the sheep are subjected to hard conditions, such as, for example, over-driving on a long journey, or unfavourable conditions on a sea voyage, then death may occur through this lung worm infestation, intensifying the danger from pneumonia. Occasionally certain worms confine their activities to the bronchial tubes, and in that situation they are amenable to injections into the windpipe, a treatment which would be of undoubted value in the treatment of highly-prized animals.

### The Best Worm Medicine for Sheep Copper Sulphate (Bluestone).

The results obtained by many farmers using the same and different worm medicines vary greatly, and these are due to the fact that no drug will kill every worm at one treatment. Owing to the fact that the lambs may be continuously picking up new worms, the best results can only be obtained by repeating the treatment monthly. Treatment should start when the lamb is about three months old, and be repeated from three to six times, according to the degree of infestation.

Recent investigations carried out at Cambridge by the Institute of Animal Pathology showed that, up till now, no treatment has been discovered that will kill every kind of worm, although certain treatments will kill certain worms. This is a very important finding, and serves to explain the unsatisfactory results so frequently met with following the use of many proprietary medicines. Experiments show that *hæmonchus contortus*, one of the commonest parasitic worms, can be killed with copper sulphate, and that this substance is very suitable for general use, since it is cheap and safe, and can be given either dry in capsules or in solution. *Hæmonchus contortus* is one of the commonest of parasitic worms in New Zealand, and the fact that it can be killed by so simple and cheap a drug as bluestone is of



great practical importance. Other remedies tested consisted of carbon tetrachloride, tetrachlorethylene (nema) arsenic tabloids, a combination of copper sulphate and sodium arsenite, and, among others, a mixture of turpentine, chloroform and linseed oil. The results showed that these remedies were either ineffective, expensive, dangerous, or possessed no advantage over bluestone.

#### The Preparation of Bluestone Solution.

Dissolve two ounces of pure bluestone crystals in a gallon of water, using an enamelled, wooden, or earthenware, but not iron, container. While drenching, keep the solution well stirred. The last few doses of an improperly-mixed solution may cause poisoning and death.

Doses:—For lambs 3 months old—  
 $\frac{1}{2}$  to 1 fluid oz. (or 1 to 2 table-spoonsful).

For lambs 6 months old—  
 1 to 2 oz. (2 to 4 tablespoonsful).

For lambs 12 months old—  
 2 to 3oz. (or 4 to 6 tablespoonsful).

Adults—  
 3 to 4oz. (or 6 to 8 tablespoonsful).

At a cost of 1/9, 1lb. of pure bluestone crystals mixed with eight gallons of water will make eight gallons of the solution, and this quantity is sufficient for one drench for 1280 three-months-old lambs.

#### The Method of Drenching.

Although the drenching of sheep is quite a simple operation, the beginner often succeeds in choking several animals. If the sheep is allowed to throw back its head during the operation, the chances of the drench entering the windpipe are greatly increased. The simplest method of preventing this happening is to place the left thumb in the animal's mouth or the left hand over the animal's face while administering the drench with the right. The best drencher to use is a self-filling metal one such as is common on the market to-day. All sheep to be dosed for internal parasites should be fasted for 12 to 15 hours prior to treatment; nevertheless, each sheepfarmer should be guided by the condition of his flock as to whether they will stand the full fasting period or full dose of medicine. A full dose of worm medicine should not be given to weak animals, as better results can be obtained by halving the dose and repeating in a fortnight. This practice of giving half normal doses at fortnightly intervals is specially recommended for unweaned lambs and, particularly, weak hoggets.

#### College Trials.

The dosing of lambs monthly for six months is likely to be looked upon as a very expensive and troublesome operation, and so the following trials were made to determine the time taken in dosing sheep. Results were as follows:

Average No. of sheep dosed per hour.	No. of Men required.	Form of Medicine.	Apparatus Used.
150	1	Tablet	Given by hand
152	2	5c.c. capsules	Gag and forceps
120	1	Mixture, 2oz. dose	Bottle
180	1	Mixture, 1oz. dose	Bottle
194	1	5c.c. measured dose	Glass tube

Perusal of these results shows that, in practice, the number of lambs or adult sheep that can be dosed per hour is influenced by:—

(a) The form in which the medicine is administered: solution, tablet, capsule, etc., and the type of drencher.

(b) The quantity to be given if a solution is used, and the necessity, as with some drugs, that the capsule should not be broken in the mouth.

(c) The experience of the drencher and the erection of suitable pens to prevent waste of time.

#### The Economics of Treatment.

With the above data it is possible to point out the economic importance attached to the regular dosing of sheep for parasitis gastritis, and, incidentally, lungworm disease. It would be foolish to suggest the monthly mustering of hundreds of sheep scattered over thousands of acres carrying one sheep per so many acres. That is beyond practical consideration, and seldom is parasitism common on such pastures. The following example is applicable to farms carrying one or more sheep per acre, and so managed that the animals can be penned up in a reasonable amount of time.

A 400-acre farm carrying 1000 sheep valued at £1 a head is taken as an example. Two men can muster, fast, and dose these sheep in two days. Allowing the men 15/- per day, and £2 for the medicine to be used once a month for six months, the following are the costs incurred:—

Wages: 15/- per man per day (2 days), 6 dosings	..	£18
Cost of Medicine	..	£2
		£20

An energetic man, under favourable conditions, could do the work single-handed, and thus save the labour cost.

Now, in order that a sheepfarmer should not lose on the above estimate of £20 spent in treating his sheep once a month for six months, it is necessary that his losses prior to the adoption of treatment be in the neighbourhood of £20. To save 20 sheep at £1 per head (2%

losses) would cover the expense entailed. The figures just quoted, however, do not include any depreciation in value owing to the loss of condition among the sheep that do not die. This loss of condition is often considerable, and increases with the increase in deaths and the shortage of food. Thus 1000 sheep losing condition at the rate of sixpence per head means a total loss of condition valued at £25. The 2% of losses quoted for purposes of illustration is a very modest estimate; in practice this figure may reach as high as 20 to 40%, and with the above data sheepfarmers experiencing heavy losses from worms should be in a position to work out the value of preventive treatment.

#### Summary.

(1) Intensive agriculture and permanent pastures may predispose to the propagation of worm parasites and contamination of pastures.

(2) Bluestone is generally recognised as the best medicinal agent that can be employed in the treatment, control, and eradication of lung and stomach worms affecting lambs and adult sheep.

(3) Lungworms are incurable when situated in the substance of the lung, but the incidence of the disease can be considerably reduced by treatment with bluestone once a month, starting when the animals are young.

(4) Newly-bought sheep and lambs reared on worm-contaminated pasture should be dosed regularly.

(5) An interpretation of the results of the experiments carried out at Cambridge and trials at the College proves that the regular dosing with bluestone of all sheep on contaminated pastures is a sound proposition, resulting in definite gain to the sheepfarmer.

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