

GRASS STAGGERS IN DAIRY COWS.

Factors causing the upset of magnesium metabolism in this disease are being investigated by preliminary work on the rat, which will be later be extended to ruminants. The effect of the level of dietary magnesium on the calcium and magnesium contents of bodies, bones, and blood has been determined. The most interesting finding is that the blood-magnesium level reflects the magnesium content of the diet, and by feeding extra magnesium as carbonate, sulphate, chloride, or phosphate the magnesium content of the blood has been raised considerably above the normal. This relationship is being tested out on sheep which are being drenched daily with magnesium salts, and will later be tested on cows supplied with magnesium-containing licks or with magnesium salts in their drinking-water. The importance of the work resides in the fact that, since the most marked finding in the blood of cows with grass staggers is a greatly reduced magnesium content, then a practicable method of raising the blood magnesium during the period of susceptibility to the disease might help to mitigate its incidence. Such methods as supplying stock-licks containing large proportions of magnesium if these can be made palatable, or the introduction of soluble magnesium salts into drinking-water, might achieve this end.

Different strains of rye-grass, which forms a large proportion of the pasture in districts where grass staggers occur, are being investigated at various stages of growth.

IODINE INVESTIGATIONS.

This work has been very actively prosecuted during the year. Several thousand thyroid glands, comprised in 760 samples, have been forwarded by Veterinarians and Meat Inspectors and analysed for iodine content.

It was thought that bobby calves might provide material for a preliminary survey of Taranaki, and with this aim the Veterinarian at New Plymouth examined 1,750 bobby-calf thyroids during August and September. He found 4 per cent. enlarged above 15 grammes. One hundred and nineteen glands were analysed, and all found to have an iodine content above 0.03 per cent., the critical value.

With three exceptions, the enlarged glands came from two definite but unidentified districts. Lack of iodine is evidently not the cause of enlarged glands among bobby calves in Taranaki. Possibly, except in cases of acute deficiency, lack of iodine is not reflected in the new-born young, which is supplied from the body store of the mother, even though the latter may be depleted.

In the Wairarapa district samples of thyroids from sheep varying from three months to six years old showed that the age considerably affected the iodine content, the percentage of iodine increasing with age. On the other hand, forty-three pairs of samples of lambs' thyroids showed no difference between male and female glands, either in size or iodine content. Certain generalizations were drawn from the analyses of the glands, correlating iodine content with the type of country from which they were derived.

Limestone land, constituting the Maungaraki Range and its northern continuations, produced lambs whose thyroids were definitely high in iodine, the majority giving yields in excess of 0.09 per cent. Thyroids from the greywacke hills of the west and south Wairarapa were considerably lower, the greater number being between 0.06 per cent. and 0.09 per cent. On the mudstone areas of the East Coast figures between 0.03 per cent. and 0.06 per cent. were most common. In the alluvial river valley of the Ruamahanga the majority were also between 0.03 per cent. and 0.06 per cent.

A lick-feeding experiment carried out on the Taratahi plains did not result in any changes in the weights of the animals or their thyroids as against controls, but the iodine content of the glands varied in proportion to the amounts of iodine fed (varying from 3 oz. to 60 oz. potassium iodide per ton of salt).

In the Southland and Otago districts special attention was paid to the occurrence of goitre, which is found in sheep in some parts of these areas. The occurrence of three variables (weight, per cent. iodine, and per cent. moisture) afforded some means of classification and definition of the term "goitre." The variation of moisture content was from 61.2 per cent. to 87.8 per cent. (average 74 per cent.), and the heaviest glands had not necessarily the greatest percentage of moisture. Glands from sheep were appreciably heavier than those from lambs with the same percentage of iodine, but the number was relatively small.

The average weight of glands containing 0.03 per cent. iodine is 3.57 grammes. Accepting this as a provisional standard, about 36 per cent. of the glands in Otago and Southland districts are enlarged above normal, while about 10 per cent. are grossly enlarged—i.e., weigh over 6 grammes—the latter occurring at Maitai Island, Otama, Stirling, Milton, and Awamangu.

Experiments on the efficacy of iodized-salt licks as a means of increasing the iodine content of glands are at present being carried out in Southland.

FIFTH ANNUAL REPORT OF THE MINERAL CONTENT OF PASTURES INVESTIGATION AT THE CAWTHRON INSTITUTE.

(Period: 1st April, 1932, to 31st March, 1933.)

By Mr. T. Rigg, Director of Research.

During the period under review much time has been devoted to a continuation of studies in connection with the cause of bush sickness. Following up the conclusions arrived at in earlier investigations of the Cawthron Institute concerning the important part played by soil iron in determining the incidence or otherwise of bush sickness in particular localities, a very detailed examination of the available iron content of a wide range of volcanic and sedimentary soils was undertaken. Much attention has been paid to the estimation of iron in different pasture and native