

MINERAL CONTENT OF PASTURES RESEARCH.

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The mineral content of pastures investigation is a research carried out conjointly by the Chemistry Division of the Department of Agriculture and the Cawthron Institute. As the result of the accumulation of information regarding the mineral composition of improved and unimproved pastures of all types and at all seasons in many parts of New Zealand, it is now possible to devote attention, for the most part, to the remedying of the deficiencies revealed.

BUSH SICKNESS.

The most important feature of the year's work has been the conclusive demonstration of the efficacy of finely ground limonite (hydrated oxide of iron) in preventing and curing bush sickness in sheep. With the knowledge that breeding-ewes can be maintained in perfect health, and can produce a normal percentage of high-class lambs, which in turn can be fattened or reared for flock purposes at a trifling increased cost and trouble, the problem of bush sickness can at last be deemed to have been satisfactorily solved. The evidence for this claim is based upon a large-scale experiment using limonite mixed in equal proportions with salt as a lick for breeding-ewes and lambs. Limonite is procurable from the Whangarei district, where the supplies occur naturally, and, after grinding, are incorporated with salt to form a lick.

Originally, spathic iron-ore (iron carbonate) was tried, but was abandoned because of its costliness, irregular quality, and the difficulty to secure regularly samples of even grade.

The field experiment was conducted at Atiamuri, a locality in the Rotorua district well within the area affected by bush sickness. From a flock of two thousand ewes, four groups of fifty were selected between two and three years of age. All had been on the property for at least two years. The groups were subjected to the following treatment:—

- Group 1: Control, no lick.
- Group 2: Lick containing iron and ammonium citrate, and salt.
- Group 3: Lick containing Whangarei hydrated iron oxide (limonite) and salt.
- Group 4: Lick containing spathic iron-ore and salt.

All groups grazed the same paddocks in rotation. Possibly owing to taste, the iron-citrate lick was only sparingly consumed, but the iron-oxide lick was taken freely. The quality of the spathic iron-ore was poor, and consequently was likely to have yielded only a small supply of iron.

In each of the groups twelve ewes were selected for weighing at monthly periods. By mid-February all the lambs in the control and citrate groups were dead. In the iron-oxide group forty-four lambs from forty-five ewes were well developed, robust, and with a healthy bloom in their wool, while the ewes were bright and healthy. Only sixteen of the control ewes survived, and were in poor condition, while twenty-four of the citrate group survived, and were in slightly better condition than those of the control group. Post-mortem examinations of lambs from the limonite and from the main flock showed that, while the latter was badly infested with worms, the former was entirely free, thus giving some indication that the iron-oxide treatment enabled the lambs to resist parasitic infection. The results may be tabulated as follows:—

	Ewe's Weight.		Lambing Percentage.		Surviving at February, 1932.	Weight of Ewe's Fleece, 20th February, 1932.
	5th May, 1931.	8th February, 1932.	At Birth.	When marked.		
	lb.	lb.				lb.
Limonite group	120	128	100	90	98	8·1
Iron ammonium-citrate group	112	92	62	16	Nil	7
Control group	114	72	76	50	Nil	6½

Experiments with the incorporation of iron in ensilage have been continued, and it was found that cows which refused to take an iron lick and had sickened were readily cured when fed with treated ensilage. Good results have been secured from feeding limonite to dairy cows and calves, and it has also proved useful when used as a drench for animals already sick.

Evidence is available from dairy-farmers located in the bush-sick areas of the efficacy of the limonite licks made available for their herds, and it would appear that already a large number of farmers in this area have no longer any fear of being unable to cope with bush sickness.

Experiments in this district, where the practice of green-manuring has been adopted, indicated that stock showed decided preference for the grass growing on areas so treated.

On the Mamaku Demonstration Farm, which has for long been seriously affected by bush sickness, and where the original iron-ammonium-citrate treatment had been in vogue for a number of years, a change was made to the use of the limonite salt lick in January, 1932. With the change, no sickness has been reported, the whole herd has done splendidly, and the lick is freely consumed. Before the change was made, sheep which sickened on the property had to be sent out of the district to recuperate, but it is anticipated that the adoption of this treatment will now render such action unnecessary.