

2 lb. per acre. In all cases very appreciable increases in cobalt content have been obtained. Some figures obtained at the Marsden Research Farm with 1 cwt. per acre and 10 lb. per acre are given below.

Date of Sampling.	Cobalt as p.p.m. of Co. on Dry Basis.			
	Control.	1 cwt. Cobalt Chloride per Acre.	Control.	10 lb. Cobalt Chloride per Acre.
15th September, 1936	1.26	37.7	..	..
29th September, 1936	0.70	25.2	..	..
13th October, 1936	0.44	14.0	0.46	21.5
28th October, 1936	0.36	14.0	0.27	8.8
12th November, 1936	0.39	14.6	0.27	8.2
2nd December, 1936	0.29	14.9	0.27	4.6

NOTE.—1 cwt. application on 21st August, 1936 ; 10 lb. application on 23rd September, 1936.

These data show the changes in cobalt content which have occurred since top-dressing. A rapid fall in cobalt content occurs at first, but later a more or less stable value is approached. The 2 lb. application of cobalt chloride is of interest because of its use in the animal trials at Glenhope, and also because it provides an economic method of increasing the cobalt content of a pasture.

It has already been shown that sick sheep improved wonderfully in health after grazing the top-dressed pasture at Glenhope. A sample taken eight weeks after top-dressing showed a cobalt content of 0.20 p.p.m., whereas the control sample showed only 0.05 p.p.m. This increase in cobalt content could easily explain the good results with the sheep by reason of the cobalt supplement supplied in this treated grass.

COBALT STATUS OF ANIMAL ORGANS.

In April, 1936, typical sheep from the groups at Glenhope were slaughtered and the organs and blood removed for chemical examination. In the control (no drench) group low values for cobalt were found in certain organs and blood as compared with samples from the sheep receiving the cobalt drench. For example, in the liver of the control sheep only 0.02 p.p.m. of cobalt on the dry basis was found, as compared with 0.22 p.p.m. in the liver of cobalt-treated sheep. That this last figure is not abnormally high was shown by the examination of livers from healthy sheep in the Nelson district. Here the range of cobalt content was from 0.07 p.p.m. to 0.25 p.p.m. on the dry basis, with an average of 0.12 p.p.m. It would appear that the liver may be a useful organ for judging the cobalt status of animals.

The very low figures obtained at Glenhope suggest that the ailment there is due to cobalt deficiency and that the good results from the use of cobalt salts are due to this deficiency being removed.

Further to the drenching technique, experiments on the rate of excretion of cobalt have been made in collaboration with Mr. S. W. Josland, of Wallaceville. Sheep were given a dose of 4 mg. of cobalt (as chloride), and analyses made of the urine and faeces excreted. Rapid absorption and elimination through both urine and faeces were found, so that after five days the cobalt content of the excreta had returned to normal. This result indicates, and the analysis of the organs confirms, that large amounts of cobalt are not stored in the animal and that toxic effects are unlikely to follow the continued use of suitably prepared cobalt drenches and licks.

REPORT ON MORTON MAINS INVESTIGATIONS.

(J. K. DIXON.)

In a previous report it was recorded that cobalt drenches were completely successful in the control of a lamb ailment occurring at Morton Mains and other parts of Southland. In the present season's experiments an easier and equally effective method was sought for supplying cobalt to the animals. Drench guns have been used this year in Southland with success. Over two hundred lambs per hour can be drenched by a competent man. However reliable this method is, there is still the trouble of yarding and handling the lambs. Consequently two other methods—top-dressing of pastures and the use of licks—suggested themselves as worthy of trial.

LICK EXPERIMENTS.

A lick was made up containing 2 oz. to 4 oz. of cobalt chloride to the ton of dairy salt. For the experiment a flock of pregnant ewes was made available by the Southland Frozen Meat Co., and the sheep were divided so as to test the following points:—

- (1) Whether the prepared lick was as effective as a cobalt drench.
- (2) Whether a cobalt lick when supplied to pregnant ewes would enable sufficient cobalt to be transmitted to the offspring to make unnecessary the use of further cobalt supplements after lambing.
- (3) Whether it was sufficient to feed a cobalt lick to the ewes and lambs only after lambing.