A preliminary investigation into factors affecting lamb growth on Taranaki hill country

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ABSTRACT

The growth of lambs, herbage mass and pasture composition (pre- and post-grazing), were monitored from January to June 1984 on 3 farms carrying 12 to 13 su/ha in the Taranaki hill country. Live weight was measured monthly on a random 5% of each flock. Additional animals were treated with cobalt (vitamin B_{12}), selenium or both to identify possible deficiencies of these elements. A 'preventative' drenching programme was adopted on each farm to control gastro-intestinal worms.

Mean daily live-weight gain was low (49 to 74 g/lamb) and did not improve significantly as a result of selenium or vitamin B_{12} treatment. Faecal egg counts indicating significant worm burdens were recorded on 2 of the farms in autumn despite regular drenching.

Pasture before grazing were characterised by a high herbage mass (>3000 kg DM/ha) and a low green leaf content (50 to 60%). Apparent utilisation of DM at a single grazing was low (14 to 24%) but utilisation of green leaf was higher (28 to 43%). Green stem and dead herbage were not utilised.

Although no factor was clearly defined as limiting animal performance, it is felt that improvements could be made by more intensive grazing (so that young stock are presented with lower herbage mass of higher green leaf content) and by adopting a more effective drenching programme.

Keywords Sheep; hill country; internal parasites; selenium; vitamin B_{12}; pasture utilisation; pasture composition.

INTRODUCTION

Trials conducted in Taranaki in the early 1970's (Thomson, unpublished) indicated poor growth (<35 g/d) of lambs from February to June despite regular anthelmintic treatment and a high amount of pasture on offer.

A survey of the Taranaki/Wanganui hill country (Thomson *et al.*, 1983) again highlighted poor animal performance. In Taranaki, this was attributed mainly to an inability to control the high summer/autumn pasture growth leading to a decline in pasture quality.

Consequently a series of monitoring programmes was initiated to investigate aspects of animal performance, animal health and the mass and composition of Taranaki hill country pastures to gain a better understanding of the problem. The findings of the first programme concentrating on the performance of ewe lambs over summer and autumn are reported here.

EXPERIMENTAL

Three farms (A, B and C respectively) were selected, one each in south (Patea), central (Mangamingi) and north (Tarata) Taranaki for their higher than average stocking rates (12.0, 12.8 and 13.5 su/ha respectively) and topography representative of the district (terraced, steep and rolling respectively). The farms were all receiving reasonably intensive advisory input.

On each farm, pasture and animal performance were monitored from January to June 1984. Five per cent of the ewe lambs were randomly selected as a control group and a further 3 groups of 25 lambs each were treated with cobalt (2 mg vitamin B_{12} every 8 weeks), selenium (4 mg every 4 weeks) or both. A 'preventative' anthelmintic drenching programme (Vlassoff and Brunsdon, 1981) consisting of 3 x 21 d drenching from weaning then every 28 d, was adopted for the entire lamb flock, including the 4 treatment groups.

At monthly intervals, faecal samples were collected from 12 of the control animals, selected at random, to determine worm burdens and blood samples were taken for selenium and vitamin B_{12} analysis.

Herbage mass and pasture composition (green grass leaf, green stem, legume (clover and lotus), weed, dead leaf and dead stem), pre- and post-

grazing, were recorded fortnightly. Herbage mass was determined using the single probe capacitance meter (Vickery *et al.*, 1980), taking 150 to 220 readings/paddock. The meter was calibrated monthly by taking readings on 27, 0.2 m^2 plots on a range of hill country pastures and cutting these to ground level to determine herbage mass. Pasture composition was determined from 40 to 50 sub-samples/paddock (each sample approx 0.01 m^2) cut to ground level and bulked. Each fortnight a pasture sample was collected from the next paddock to be grazed and inspected for facial eczema (*Pithomyces chartarum*) spores by the wash count method.

The monitoring programme commenced on each farm in January, at the end of the 3 x 21 d drenching regime.

TABLE 1 Mean live-weight gains (g/d) from January to June.

	Farm		
	A	B	C
Control	49	74	69
Vitamin B_{12}	47	77	75
Selenium	50	81	80
B_{12} + Selenium	57	71	76
SE	13	18	29

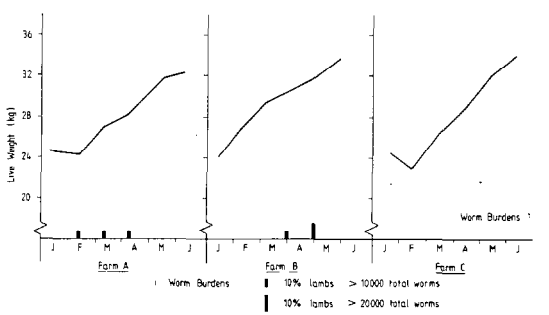

FIG. 1 Pattern of live-weight change in the control groups.

RESULTS AND DISCUSSION

Live-weight Gain

Mean daily live-weight gains (Table 1) were greater than for previous trials but still below the target growth rate of 100 g/d considered necessary over summer and autumn to achieve 55 to 60 kg 2-tooth ewes by mating. Lambs on farms B and C achieved similar live-weight gains (average 75 g/d) but on farm A gains were poorer (51 g/d). The pattern of live weight gains differed between farms (Fig. 1). Lamb live weight dropped over the first month on farms A and C. On farm A, this coincided with severe scouring (of unknown cause) in about 20% of the lambs, which may have caused the weight loss. The lambs on farm C appeared healthy despite the initial weight loss and subsequently made good growth (97 g/d). The reverse occurred on farm B, where live weight gain over the first 2 months averaged 108 g/d but dropped to 54 g/d over autumn.

Significant worm burdens (10% of lambs with faecal egg counts indicating greater than 10,000 total worms — P.B. McKenna, *pers. comm.*) were found in lambs on farms A and B (Fig. 1). On farm A the problem first occurred in February and in March, the drenching interval was reduced to 3 weeks. Worm burdens declined to low levels by May but live-weight gain did not improve. On farm B high worm burdens coincided with the period when live-weight gains were lowest, but no remedial action was taken and worm burdens also declined in May. Despite 'preventative' drenching, gasto-intestinal worms may have contributed to low live-weight gains on farms A and B.

Neither vitamin B_{12} nor selenium had a significant effect on live-weight gain (Table 1). Although at no stage did blood levels of vitamin B_{12} or selenium indicate an acute deficiency, selenium levels of farm B were within the marginal range of 130 to 250 nmol/l from January until March. Vitamin B_{12} levels fell within the marginal range (185 to 270 pmol/l) in May and June on farm C.

Facial eczema spores were found in only 1 pasture sample from farm A and the numbers were low.

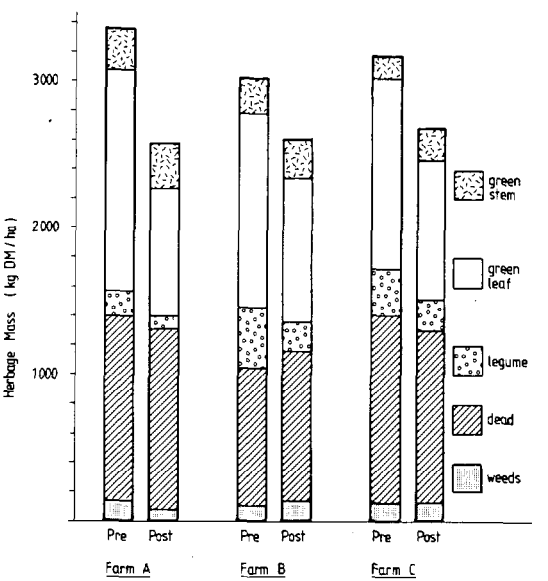

FIG. 2 The components of herbage mass pre- and post-grazing (kg DM/ha).

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