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Effect of herbage allowance on the productive performance of lactating and non lactating hoggets

J.C. McEWAN, C.D. MATHIESON

Woodlands Research Station
Ministry of Agriculture and Fisheries, Invercargill

H. HAWKER

Invermay Agricultural Research Centre
Ministry of Agriculture and Fisheries, Mosgiel

ABSTRACT

Lactating or non lactating Coopworth ewe hoggets were offered low, medium or high herbage allowances for 8 weeks during lactation in each of 2 years.

Herbage allowance had only a small effect on the penalty of a hogget lactation. Relative to their non lactating counterparts, the hoggets that had lactated were on average 12.8 kg lighter at weaning and had a 0.29 kg lower clean fleece weight. These penalties are larger than those reported in other New Zealand studies in which the lactating hoggets were preferentially fed.

The lambs reared by the hoggets had live-weight gains typical of those observed in twin lambs reared by adult ewes.

Keywords Sheep; hoggets; lactation; herbage allowance; live-weight gains; wool production.

INTRODUCTION

In a comprehensive review, Dyrmondsson (1973) concluded that the lambing of hoggets does not impair their subsequent reproductive performance and hence lifetime productivity is increased. This conclusion has been confirmed by a number of recent studies in New Zealand (Baker *et al.*, 1981; McMillan and McDonald, 1983; Moore *et al.*, 1983). Hoggets that had reared a lamb were 3 to 6 kg lighter at weaning and had 0.2 to 0.4 kg lighter fleeces than hoggets mated only by vasectomised rams. The differences in live weight had disappeared by 26 months of age, and in 2 studies subsequent reproductive performance was increased by hogget lambing.

At present only 12% (or 1.6 million) of the ewe hoggets wintered in New Zealand are joined with fertile rams (Anon. 1984). There is therefore considerable potential for increasing the productivity of sheep farms by adopting the practice of hogget joining.

In the present study the effects of level of nutrition during lactation on the productive performance of lactating and non lactating hoggets were examined. This would quantify the production penalties associated with hogget lambing over a range of nutritional levels and allow suitable management strategies to be devised.

MATERIALS AND METHODS

The experimental design was a 2 x 3 factorial

repeated over 2 years. The treatments were: lactating or control hoggets (mated by vasectomised rams) x 3 herbage allowances (2, 4.5, 7 kg DM/hogget/d) offered for 8 weeks in spring x 2 replicates. There were 10 hoggets in each of the 12 mobs within each year.

In 1983 Coopworth ewe hoggets were joined first with entire (2 to 18 May) and then with vasectomised Dorset rams (19 May to 5 June). The respective dates in 1984 were 1 to 10 May and 11 to 17 May. Hoggets mated by rams were retained. The differential feeding periods began on 12 October 1983 (8 days after the mean lambing date) and on 11 October 1984 (10 days after the mean lambing date). Of the hoggets rearing single or twin lambs in 1983, 8 of the former and 2 of the latter were randomly allocated to each herbage allowance mob. In 1984 there were 9 hoggets with single lambs and 1 with twins per mob. The control mobs were established by random allocation of the hoggets mated by vasectomised rams.

The hoggets were shifted to a new paddock each week. Herbage mass was estimated by cutting to ground level the herbage from 6 random 0.25 m² quadrats. The herbage allowance treatments were established by fencing the appropriate area for each mob using electrified netting.

Residual dry matter and offered dry matter were measured after each plot was grazed, by cutting to ground level 0.25 m² quadrats from outside and inside 2 randomly placed enclosure cages. From these

data herbage allowances and intakes were calculated.

Herbage composition was assessed by dissecting a random subsample of herbage collected from each paddock prior to grazing.

The hoggets were weighed off pasture after joining, at the start of the differential feeding period and then at 14 day intervals until weaning. Wool growth was measured by mid-side patch clipping (Hawker *et al.*, 1982). Milk production was estimated at 14 day intervals by measuring the udder volumes of the hoggets by water displacement (Davis *et al.*, 1980). Backfat thickness was measured ultrasonically (Gooden *et al.*, 1980) in week 6 of differential feeding.

Lamb live weights were recorded at birth and at 14 day intervals during the differential feeding period.

RESULTS AND DISCUSSION

The lambing performance of the hoggets joined with fertile rams in each year is shown in Table 1.

The mean pre-grazing herbage mass was 2600 kg DM/ha in 1983 and 3100 kg DM/ha in 1984. Average herbage composition was 93% grass, 6% clover and 1% dead material, with little difference between years. Herbage allowances and intakes are shown in Table 2. (This and subsequent tables show mean results for 1983 and 1984). Apparent intake was significantly affected by feeding level but there was no significant difference between the lactating and control hoggets.

Hogget live weights, live-weight gains, wool growth and udder volumes are shown in Table 3. Hoggets which subsequently comprised the lactating and non-lactating control groups had similar mean

live weights in mid May (39.2 v 39.4 kg, respectively) but the lactating hoggets were 3.2 kg lighter after lambing at the start of differential feeding. At weaning 8 weeks later the mean difference in live weight was 12.8 kg. This is considerably greater than the 3 to 6 kg difference in live weight reported by McMillan and McDonald (1983) and Moore *et al.* (1983), but in those studies the lactating and non-lactating hoggets were run separately, with the former preferentially fed.

The 18 hoggets that reared twin lambs were on average 3.5 kg lighter at weaning than those that reared singles.

TABLE 1 Reproductive performance of hoggets joined to entire rams.

	1983	1984
Number mated by entire rams	109	125
Hoggets lambing/hoggets mated	0.92	0.74
Litter size	1.19	1.14
Lamb survival (lambs docked/ lambs born)	0.77	0.78

TABLE 2 Herbage allowance and intake (kg DM/hogget/d).

Feeding level	Control			Lactating			SED
	Low	Med	High	Low	Med	High	
Allowance	2.2	4.7	6.9	2.1	4.3	6.9	0.2
Intake	1.3	2.0	2.2	1.3	1.8	2.4	0.2

TABLE 3 Hogget live weights, live-weight changes, wool growth, udder volume and backfat depth.

Feeding level	Control			Lactating			SED	Significance ¹	
	Low	Med	High	Low	Med	High		Reprod. status	Feeding level
Fed weight (kg)									
October start ²		50.3			47.1		0.55	***	—
December finish	55.1	60.1	60.5	41.1	47.4	49.1	1.14	***	***
Live-weight change (g/d)	86	170	188	-105	-4	43	14	***	***
Clean wool growth (g/d)	10.7	11.3	11.3	7.5	9.0	9.5	0.5	***	*
Mean udder volume (ml)	—	—	—	589	686	734	22	—	***
Backfat thickness (mm) ³ (week 6)	4.6	—	6.0	1.3	—	1.8	0.5	***	*

¹All interactions non significant

²Mean of 3 feeding levels

³Backfat thickness measured only on low and high feeding levels

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