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PROBLEMS IN FLUSHING EWES ON NORTH ISLAND HILL COUNTRY

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SUMMARY

In 1979 and 1980 two trials were carried out in which ewes were offered a range of pasture allowances over a 7-week period prior to joining. There was a high proportion of dead dry matter in the sward in both years; 75% in 1979 and 40% in 1980 which was a wet summer. This was associated with a low level of green herbage mass (600 kg/ha in 1979 and 1100 in 1980). Even at high allowances of green DM the ewes gained less than 20 and 70 g liveweight/d in 1979 and 1980 respectively. These values are considerably less than the 150-200 g/d achieved in flushing trials at Ruakura.

Ovulation rates were higher in 1980 than in 1979 and reached a maximum average of 1.6 eggs/ewe. Extrapolation of the data suggests hill country ewes should show higher ovulation rates at higher liveweights than in these studies but would need better pasture to obtain them.

INTRODUCTION

The average lambing percentage over the last eight years on North Island hill country has been 87% (Anon 1979). In a recent study of 44 flocks in the Raglan hill country, most of the farms had ewes of low mean liveweight (45 to 50 kg) before joining and losing weight over the late summer-early autumn period (Kelly and Knight, 1979; Knight, unpublished data) and this was associated with low lambing percentages. This contrasts with the high liveweight gains and ovulation rates obtained by Rattray *et al.*, (1980) on flat land with good quality pastures at Ruakura. There is very little information on the requirements for flushing on hill country. This paper summarises the results of two trials in which ewe responses to a range of pasture allowances were measured.

EXPERIMENTAL

In the 1979 trial, 290 mixed age ewes weighing 46 kg and comprising equal numbers of Romneys, Perendales and Coopworths (Dalton, 1978) were allocated to the five levels of green pasture allowance shown in Fig. 1.

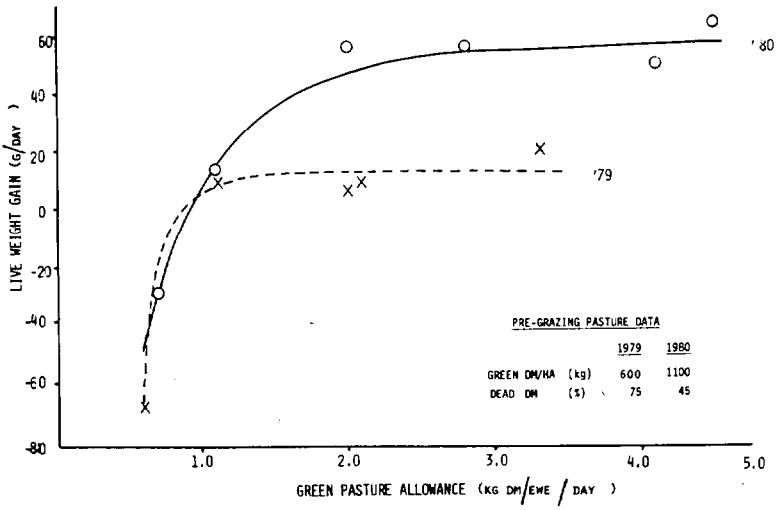

FIG 1: *Influence of green pasture allowance on mean LWG of the ewes in 1979 and 1980.*

In the 1980 trial, 370 Waihora Romney ewes (Gibson and Craig, 1980) weighing 48 kg were allocated to 6 treatments on a similar basis to 1979 (Fig. 1). In both years the flocks consisted of mature and two-tooth ewes. Both trials were run for seven weeks in the months of February and March. All ewes were run together from joining onwards.

Herbage mass/ha before and after grazing, intake, liveweight changes and synchronised ovulation rates were measured.

RESULTS

LIVEWEIGHT

Liveweight change and liveweight at the beginning and end of joining were affected by treatment in both years ($P < 0.01$). The influence of green DM allowance on fasted liveweight gain is shown in Fig. 1. The curves are Mitscherlich functions with fitted maximum daily gains of 11 and 55 g/ewe/d for 1979 and 1980 respectively. The respective residuals s.e.'s are 6 and 7 g/d.

Herbage mass before grazing was much lower and the sward dead content much higher in 1979 than 1980 (Fig. 1).

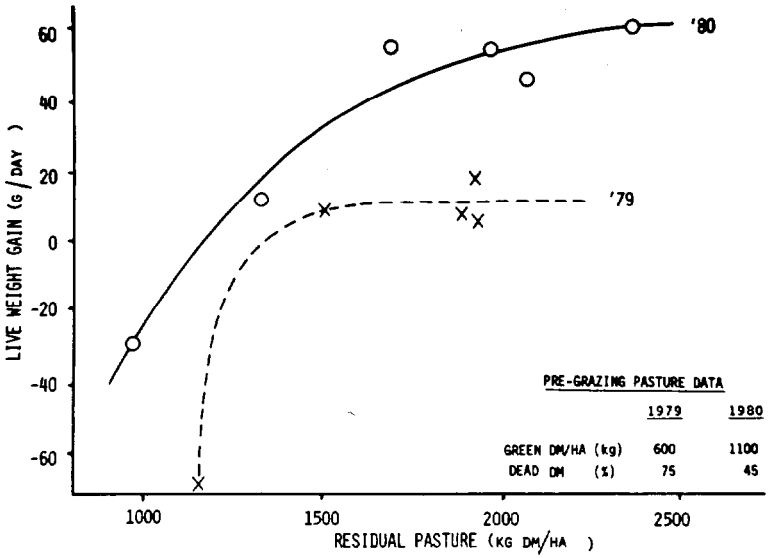

FIG 2: *Influence of residual pasture mass on mean LWG of the ewes in 1979 and 1980.*

Liveweight gain was also closely related to residual total DM/ha (Fig. 2). Residual s.e.'s for the Mitscherlich functions are 6-9 g/d, similar to those in Fig. 1 as also are the fitted maxima of 11 and 66 g liveweight gain/ewe/d for 1979 and 1980 respectively.

Joining and post-joining weights in 1979 were also affected ($P < 0.01$) by breed (Table 1).

TABLE 1: EFFECT OF BREED ON JOINING AND POST-JOINING NON FASTED LIVEWEIGHT AND ON OVULATION RATE (1979 TRIAL)

	Liveweight (kg)		*Ovulation*
	Joining	*Post-joining*	*(eggs/cycling ewe)*
Romney	44.6	47.8	1.03
Perendale	45.8	48.7	1.13
Coopworth	47.2	50.0	1.30
s.e. of the differences	0.4	0.4	N/A

OVULATION RATE

There were effects of treatment ($P < 0.05$) and joining liveweight ($P < 0.05$) on the probability of a multiple ovulation in both years. Breed was significant in 1979 ($P < 0.01$, Table 1). The two-tooths had a lower ovulation rate than the mixed-age ewes in 1980 (1.27 v 1.48 eggs/ewe $P < 0.01$).

In the model predicting the logit probability of a multiple ovulation, treatment was not significant after fasted joining live weight had been fitted to the model. Fig. 3 shows the model's prediction of the within-breed probabilities of a multiple ovulation (P) for both the 1979 and 1980 data. In 1979 the Coopworths had a higher P than the Perendales ($P < 0.1$) which in turn were better than the Romneys ($P < 0.05$). In both years all ages followed the same model (within breeds in 1979).

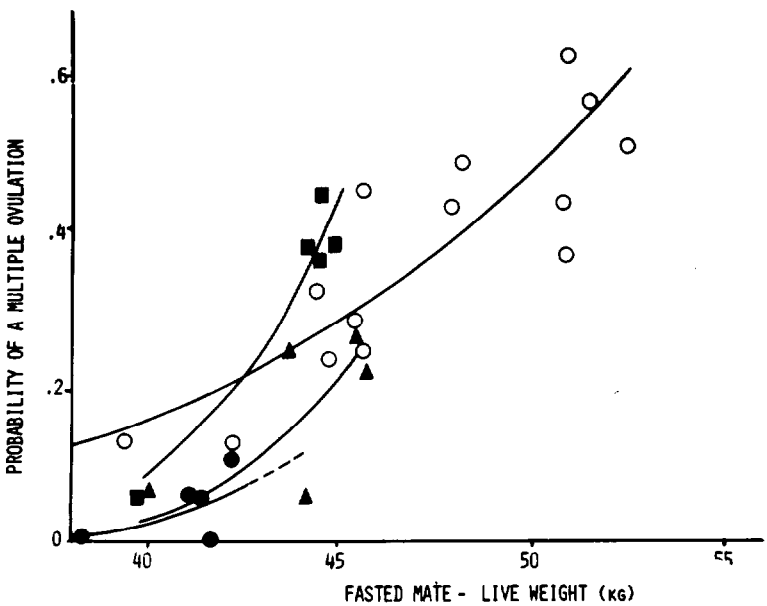

FIG 3: *Influence of fasted mating liveweight (group mean) on probability of a multiple ovulation within breeds;* ■ = *1979 Coopworth,* ▲ = *1979 Perendale,* ● = *1979 Romney,* ○ = *1980 Romney.*

DISCUSSION

Although liveweight responded to increased herbage allowance in both years it was much lower than that achieved elsewhere e.g. Rattray *et al.* (1980). The asymptotes of liveweight gain in both years were achieved at quite low green pasture allowances indicating that in the higher treatments pasture allowance/ewe/d was not a limiting factor. Even the maxima of 55-65 g/d were well below the gains of 150 g/d by Coopworths flushed in a trial by Rattray *et al.* (1980). The swards in their studies had much higher levels of green DM/ha and lower proportions of dead DM than in these pastures. Probably pasture quality (% dead DM in the sward) and green herbage mass (kg DM/ha) became limiting factors above green pasture allowances of 1.5 and 2.0 kg DM/ewe/d in 1979 and 1980 respectively. The lower availability of the green DM and the high percentage of dead DM in the sward in 1979 are closely related to the poorer performance of the 1979 compared with 1980 ewes.

The finding that residual (total) DM/ha gave as close a fit to the data as green DM allowance agrees with During *et al.* (1980). They found that residual green herbage correlated better with liveweight gain in hoggets than green herbage allowance.

The breed differences in both liveweight and ovulation rate are as expected (Dalton *et al.* (1978). The Coopworth was more responsive in terms of ovulation rate to increased pre-joining liveweight than the Perendale which in turn was more responsive than the Romney. The 1980 Romneys (ex Waihora) showed a higher ovulation rate than the 1979 Romneys. These results are similar to those reported by Rattray *et al.* (1980, 1981).

Within both years all the treatments had similar liveweights at the beginning of differential feeding so it is not possible to tell whether the differences in ovulation rate are due to the liveweight gains up to joining or the liveweights at joining, as one is a function of the other in these trials. However, the models in Fig. 3 indicate that all groups showed increasing probabilities of multiple ovulation with increasing joining liveweight. Extrapolation suggests that hill country ewes of the type reported here would respond in terms of ovulation rate at higher liveweights than in these studies. If further gains in liveweight were required then pasture quality (green content and green DM/ha) would have to improve.

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