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The effect of pre-mating feeding level and age on liveweight change on reproductive performance of cashmere does.

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ABSTRACT

Two hundred 2-tooth (2T) and mixed age (MA) cashmere does were randomly allocated to one of 4 feeding levels to evaluate the effect of pasture allowance on liveweight change and reproductive performance. Pasture allowances of 0.8 (L), 1.2 (M), 2.5 (M+) and 5.0+ (H) kgGM/hd/d were imposed for 8 weeks prior to mating. Does were weighed fortnightly and laparoscoped at 10 (CL10) and 20 (CL20) days post buck introduction.

Weight change over 8 weeks was -2.2kg (L), 0.1kg (M), 0.3kg (M+) and 1.8kg (H) and was significant ($P<0.01$) for L, M+ and H treatments. Pasture allowance had no effect on proportion of does ovulating (CL10 and CL20) but does on the L and M allowance averaged fewer multiple ovulations than does on the M+ and H allowances (14% vs 23%) at day 10 after mating.

A higher proportion ($P<0.01$) of MA does were ovulating 10 days after mating (78.7% vs 58.2%) and MA does had more multiple ovulations at 10 (52.1% vs 11.3%) and 20 (40.2% vs 13.5%) days after mating than 2T does. There were more ($P<0.01$) MA does pregnant (76.3% vs 57.1%) and more multiple pregnancies in MA does (44.6% vs 17.3%) than 2T does.

This trial showed that age is a major factor in determining proportion of multiple ovulations and multiple pregnancies in cashmere goats. It highlighted the confounding effect of age on liveweight and the difficulty in separating the effects of pasture allowance from the effects of liveweight, on reproductive performance.

Keywords Cashmere, goat, ovulation rate, pasture allowance, flushing

INTRODUCTION

The relationship between pre-mating nutrition and ovulation rate has been well researched for sheep (Rattray *et al.*, 1987) however similar information is not available for New Zealand cashmere goats. On many goats farms in New Zealand, cashmere does are used for weed control while still being required to breed upgraded stock for fibre production. There is a need to determine the effect of pre-mating pasture allowance on reproductive performance in order to manage goats more effectively.

MATERIALS AND METHODS

A trial run at Wanganui Hill Research Station (MAF Technology) in autumn 1989 examined the effect of pasture allowance and age on liveweight gain and ovulation rate in cashmere goats. Feed was allocated on the basis of pasture green dry matter (GM). Four pasture allowance treatments carried 25 2-tooth (2T) and 25

mixed age (MA) does each and offered 0.8 (L), 1.2 (M), 2.5 (M+) and 5.0+ (H) kgGM/hd/d, for 8 weeks prior to mating. Does were randomly allocated on liveweight to treatments so that initial mean liveweights for each treatment were similar. Initial liveweights within age groups were 20.7 kg (L), 20.6 kg (M), 20.5 kg (M+) and 20.9 kg (H) for 2-tooth does; and 27.2 kg (L), 26.7 kg (M), 27.5 kg (M+) and 26.8 kg (H) for mixed age does. Does were laparoscoped at 10 (CL10) and 20 (CL20) days post buck introduction.

RESULTS

Pasture allowance treatments were effective in generating liveweight differences though younger does responded differently than older does. Treatments L, M+ and H significantly ($P<0.01$) changed liveweight in both age groups (except MA does in the M+ allowance, where liveweight was maintained) and the liveweight of does on the M allowance was maintained. 2T does responded better to the higher feeding levels, gaining

significantly more weight than MA does (Figure 1).

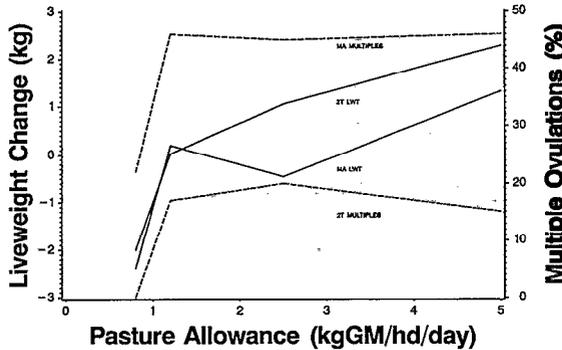


FIG 1 Mean liveweight change (LWT) and multiple ovulations (MULTIPLES) at 20 days post buck introduction, for 2-tooth (2T) and mixed age (MA) cashmere does, at 4 pasture allowances of 0.8, 1.2, 2.5 and 5.0 kgGM/hd/d.

The effect of pasture allowance on ovulation rate was not significant. However, there was a trend ($P < 0.10$) for does on the L allowance to have fewer multiple ovulations at CL20 than other does (11.8% vs 32.3%). There was no difference in pregnancy rate between does from the different pasture allowances. Due to the confounding effect of pasture allowance and of age on liveweight, the separate effects of liveweight and liveweight change on ovulation rate or pregnancy rate could not be analysed. Age had a significant effect on proportion of does ovulating and proportion of multiple ovulations. More ($P < 0.01$) MA does were ovulating 10 days after mating (78.7% vs 58.2%) than 2T does; and proportion of multiple ovulations was higher ($P < 0.01$) for MA does at 10 (52.1% vs 11.3%) and 20 (40.2% vs 13.5%) days after mating than 2T does. Proportion of does ovulating was poorly correlated with liveweight and age at mating ($r = 0.36$ and $r = 0.32$ respectively). Age also had a significant effect on proportion of does pregnant and proportion of multiple pregnancies. There were more ($P < 0.01$) MA does pregnant (76.3% vs 57.1%) and more multiple pregnancies in MA does (44.6% vs 17.3%) than 2T does.

DISCUSSION AND CONCLUSIONS

Age has a marked effect on ovulation rate, particularly proportion of multiples. This supports the findings of Parry and Maclean (1989). The lower ovulation rates seen in maiden compared to older does are difficult to overcome with flushing.

A liveweight loss prior to mating may result in lower ovulation rates in cashmere does and it is advisable to avoid a liveweight loss in does during the pre-mating period. The unexpected liveweight loss of MA does on the medium pasture allowance (M+) shows an interesting aspect of grazing behavior peculiar to goats, where goats had enough pasture available to be "fussy" but not enough to gain weight.

Proportion of green and dead matter in pasture was monitored though feed quality was not analysed in detail. The quality of the pasture, however, as with sheep (Smith, 1988) may have had an effect on ovulation rate and explain why there was no significant effect of pasture allowance on ovulation rate.

The relationship between pasture allowance and ovulation rate in cashmere goats needs further elucidation. The confounding influence of pasture allowance and age on liveweight suggests that future trials should examine the effects of nutrition on reproductive performance of goats in different age and liveweight groups, to investigate the separate effects of liveweight, feeding level and age.

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