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FLUSHING EWES ON PASTURE AND PASTURE SILAGE

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SUMMARY

The results of two trials are presented. In one trial ewes grazed different allowances of pasture, and in the other the ewes were offered a restricted pasture allowance but were supplemented with (or without) various pasture silages *ad libitum.*

In the pasture trial, 5 groups, each of 84 Coopworth ewes, were offered allowances of autumn pasture ranging from approximately 2.0 to 10 kg DM/ewe/day. Intakes, gains and ovulation rates increased with allowance, ranging from 0.9 to 2.9 kg DM/ewe/day; — 39 to 110 g/day and 1.2 to 1.8 ova/ewe, respectively.

In the silage trial ewes offered restricted grazing only had lower total DM intakes (0.9 *vs* 1.5 to 1.6 kg DM/ewe/day) and liveweight gains than those supplemented with silage (— 12 *vs* 61 to 102 g/ewe/day). Ovulation rates were not significantly affected by supplementation (1.2 to 1.3 ova/ewe). The apparent lack of response in ovulation rate is discussed.

INTRODUCTION

The average lambing percentage in New Zealand is less than 100% in most years (NZMWBES, 1977). The most critical period of the year for the breeding ewe is the summer-autumn period. It is known that improved feeding of ewes at and prior to mating and high liveweights at mating result in an increase in ovulation rate and subsequent lambing percentage (Coop, 1966).

This paper summarizes the results of two trials — one in which different allowances of pasture were offered to ewes, and one in which various silage supplements were offered to ewes in addition to a restricted pasture allowance.

EXPERIMENTAL

In the 50-day pasture trial, during February and March, 5 groups, each of 84 mixed-age 50 kg Coopworth ewes, were offered pasture allowances ranging from approximately 2 to 10 kg DM/ewe/day. Pasture intakes, fasted liveweight changes and ovulation rates (via endoscopy) were measured. Pasture allowances and intakes were measured using the technique described by Rattray (1977).

In the silage trial, which was conducted during the same period, groups of 84 mixed-age Coopworth ewes averaging 45 kg liveweight were offered either restricted grazing or similar grazing supplemented with various pasture silages *ad libitum.* Two ryegrass-dominant pastures were ensiled, one at ear emergence (A), and the other just prior to ear emergence (B). The low DM silage (low DM A) was direct harvested with a flail harvester, while part of the area was cut with a rotary drum mower, wilted for 48 hours, then picked up with a flail (wilted A). From the second area two silages were wilted in a similar manner but picked up with either the flail (wilted B) or with a precision chop harvester, which chopped the material into 10 cm lengths (wilted, chopped B). Pasture and silage intakes, fasted liveweight changes, and ovulation rates were measured.

RESULTS AND DISCUSSION

The results of the pasture trial are summarized in Table 1. As pasture allowance increased, pasture intake, liveweight change and ovulation rate all increased curvilinearly. Gains and ovulation rates tended to level off at an allowance of approximately 6 kg DM/ewe/day. The pasture yielded 3000 to 4000 kg DM/ha and was of poor quality, containing 57% dead matter (DM basis) and having an *in vitro* OM digestibility ranging from 50 to 60%. The high proportion of dead material in the post-grazing residue, ranging from 63% at the most liberal allowance to 82% at the lowest allowance, indicated that the ewes were tending to avoid ingesting dead material.

This trial showed that it was possible to obtain a response in ovulation rate by increasing feeding levels even on poor quality autumn pasture; however, a very liberal allowance (6 kg/ewe/day) was necessary to ensure a flushing response. If pasture quality was higher (75 to 80% digestible) lower-allowances may have been adequate. The proportion of highly-digestible green material may be critical.

TABLE 1: RESPONSE OF EWES TO DIFFERENT PASTURE ALLOWANCES

	Pasture Allowance (kg DM/ewe/day)				
	2.0	*4.2*	*6.3*	*8.8*	*10.7*
Pasture intake (kg DM/ewe/day)	0.9	1.4	1.7	2.5	2.9
Liveweight change (g/ewe/day)	—39	23	79	110	90
Ovulation rate (ova/ewe)	1.2	1.5	1.7	1.8	1.7

TABLE 2: RESPONSE OF EWES TO SILAGE SUPPLEMENT

	Silage DM (%)	*Pasture Intake*[1]	*Silage Intake*[1]	*Live-weight Change* (*g/ewe/ day*)	*Ovulation Rate* (*ova/ewe*)
Grazing		0.9	—	—12	1.2
Grazing + Low DM A	18.4	0.9	0.6	61	1.3
Grazing + Wilted A	33.0	0.6	1.0	75	1.3
Grazing + Wilted B	36.8	0.6	1.0	100	1.3
Grazing + Chopped Wilted B	34.8	0.4	1.2	102	1.2

[1] kg DM/ewe/day.

The results of the silage trial are summarized in Table 2. The ewes on grazing only were at about maintenance. Ewes on the low DM (A) silage had similar pasture intakes to the unsupplemented group but in addition consumed 0.6 kg silage DM and this resulted in considerable liveweight gains. Wilting of this material led to a 67% increase in silage intake, but a 33% decrease in pasture intake. Gains were marginally higher than those on the low DM (A) silage. Intakes of pasture and wilted silage for the pre-emergent material (B) were the same as those for A, but the gains were considerably better, reflecting the higher quality of the less-mature material. Chopping of the material before ensiling led to a 0.2 kg DM/ewe/day increase in silage intake, but a similar decrease in pasture intake, and gains remained the same. These trends in intake and gains are similar to those reported for a previous trial (Rattray, 1977), but the overall levels of silage intakes and gains were higher in this trial.

In spite of the very satisfactory liveweight gains obtained with feeding silage, there was no significant flushing response in terms of ovulation rate.

Although comparisons between these trials should be interpreted with caution, there does appear to be a difference between pasture and silage in the flushing response. For each trial, between-group regressions were derived of ovulation rate on liveweight gain. The correlation coefficients were 0.79 for the pasture trial and 0.23 for the silage trial.

Number of ovulations was more highly correlated with average liveweight than weight gain. For each trial there were no significant differences between the regression coefficients of ovulation rate on liveweight calculated within treatments so pooled regressions were derived. The regression coefficients ($\pm$ SE) and correlation coefficients were:

$$\text{Pasture trial: } 0.0394\ (\pm\ 0.0076),\ r = 0.50$$
$$\text{Silage trial: } 0.0136\ (\pm\ 0.0039),\ r = 0.19$$

The regression coefficients were significantly different ($P < 0.01$). For every kg increase in liveweight there was a three-fold greater increase in ovulation rate when the ewes were fed pasture alone, as compared with pasture plus silage.

In the silage trial, true liveweight gains may have been lower than in the pasture trial because of higher "gut-fill". However, it is assumed that the fasting reduced any such effect. Another possible explanation for this could be a deficiency in true protein or a specific amino acid in the silage or its digestion products (Barry, 1971, 1972; Lancaster, 1976; Gill and Ulyatt, 1977; Rogers and McLeay, 1977). A recent study with rats has shown methionine incorporation into protein in the anterior pituitary and median eminence areas of the brain to be associated with the ovulatory surge of LH (Haar and McKinnon, 1977).

With the increasing use of silage as a summer-autumn feed for ewes, confirmation of this effect and possible methods of overcoming it are required. Withdrawal or replacement of the silage (*e.g.*, with hay) just prior to mating may be satisfactory. Sulphur supplementation may also be beneficial. The economics of formaldehyde treatment or of supplementing with high-quality protein or sulphur-containing amino acids are doubtful. Further research is planned to investigate this apparent lack of flushing on silage.

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