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Use of the teaser ram effect to advance lambing date in a farm systems study

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ABSTRACT

The normal onset of seasonal oestrous behaviour in Romney derived breeds can be advanced by the use of teaser rams and social facilitation. This technique was used, as part of a farm systems trial, to advance the start of lambing from September 1 to August 1. In the first year, the use of Dorset rams at ratios of 0, 3, 6 and 9 per 100 ewes resulted in 0, 72, 81 and 86% respectively of ewes ovulating at the silent oestrous. In the following year, a ratio of 8% was used in combination with CIDRs after the silent oestrous. This extra manipulation gave no advantage in terms of ewes lambing and ewes lambing multiples. Use of Coopworth rams instead of Dorsets and priming the teaser rams by exposure to oestrogen treated speyed ewes likewise had little impact.

Over all years, teasing resulted in a similar proportion of ewes lambing (87%) compared to the later lambing non-teased groups (89%). However, the early groups had only 37% multiple births compared to the late lambing ewes (48%, $P<0.01$). The 31 day advance in start mate date in the early ewes resulted, on average, in a 27 day advance in mean lambing date ($P<0.01$). When weaned on the same date the early lambs were 2.27 kg heavier than the late lambs ($P<0.01$).

Keywords: sheep; ewes; ram effect; teaser ram; lambing date; breed; ratios; CIDRs; farm systems.

INTRODUCTION

Recently increased demand for early spring lambs by meat companies requires ewes to be mated at least by the beginning of March. However, the normal seasonal breeding pattern of Romney derived breeds in the North Island of New Zealand is from mid-March to mid-August (Smith *et al.*, 1989) with maximum fertility in April for a September lambing (Quinlivan and Martin 1971).

Various technologies are available to advance reproductive activity in Romney derived breeds of which the use of teaser rams with or without CIDRs is an example (Smith *et al.*, 1989; Knight 1983). At Whatawhata Research Centre, the practice of advancing lambing date through the use of the teaser ram effect was developed within a systems context. Various aspects of this technique were tested and the procedure refined over a 4 year period. The outcome of this developmental process is described.

MATERIALS AND METHODS

The ram effect approach was part of a larger farm systems trial involving 2 lambing dates, 3 shearing treatments and 2 pasture types by 3 replicates (Sheath *et al.*, 1990; Webby *et al.*, 1990). The trial ran over 4 years; 1987 to 1990 inclusive and hereafter referred to as years 1, 2, 3 and 4. In each year, 650 Romney x Coopworth ewes were grazed in 12 similar farmlets at 9.2 ewes/ha along with 5 yearling Friesian bulls per farmlet. Each farmlet was 5.5 to 6.0 ha of a mix of easy to steep contoured land. Half the farmlets were assigned to the early and half to the late lambing systems.

Ewes were teased using mixed age rams (Knight 1983). Various Dorset ram ratios plus CIDRs were used in year 1, 8% Coopworth rams and CIDRs in year 2 and 8% Coopworth rams and no CIDRs in years 3 and 4. When used, the CIDRs were inserted 4 days after ram introduction began on February 15. This was after the first (silent) heat was expected to have occurred (Knight 1983). In year 2, the teaser rams were stimulated or ‘primed’ by exposure to oestrogen treated speyed ewes prior to joining.

Early mating began on March 1 and late mating on March 31. Mating ended on April 20 and May 20 respectively. Lambing date, rate and liveweights were measured. In years 3 and 4, facial eczema was perceived to be a factor that could influence ovulation rate and lambing performance. Ewes were blood sampled for gamma glutamyl transferase (GGT) levels to assess liver damage (Towers and Stratton, 1978). In year 1 only, the ewes were laparoscoped on about February 20 to determine ovulation rate at the silent hear.

Data were analysed by analysis of variance using replicates within treatments as the observation unit. Within each year therefore, there were 36 observations. In years 3 and 4, GGT data were analysed by covariance analysis. Comparisons of lambing spread were conducted using a non-parametric sign test for equal variances. All results are presented as fitted values.

RESULTS

In year 1, teaser ram ratios of 0, 3, 6 and 9% of rams per ewe resulted in 0, 72, 81 and 86% respectively of ewes ovulating at the silent oestrous.

Use of CIDRs after this silent oestrous seemed to be of little additional benefit. This is seen in Table 1 by comparing differences in lambing rate between early and late lambing ewes in year 2 (CIDRs used), with years 3 and 4 (no CIDRs used). Use of Coopworth teaser rams in years 2, 3 and 4 gave a similar result to the Dorsets used in year 1. Priming the

Coopworth rams by exposure to oestrogen treated speyed ewes prior to teasing in year 2 was likewise of little additional benefit.

Over all years (Table 1) teasing resulted in similar numbers of early ewes lambing but 11% less ewes lambing multiples compared to late lambing ewes. This meant that when all lambs were weaned on the same day in each year, litter weaning weight per ewe was similar for both early and late lambing treatments. The early lambs were heavier at weaning but there were fewer of them (Table 2).

TABLE 1: The percentage of ewes lambing (EL) and lambing multiples (ELM).

Year	1	2	3	4
%EL -early	93	87	84	84
%EL -late	92	92	88	84
Significance	NS	NS	NS	NS
%ELM -early	39	35	44	31
%ELM -late	49	59	42	43
Significance	P<0.05	P<0.001	NS	P<0.05

TABLE 2: Lambs weaned per ewe (NLW), lamb weaning weight, and litter weaning weight, per ewe.

Year	1	2	3	4
%NLW -early	111	98	99	89
%NLW -late	115	130	101	108
Significance	P<0.01	P<0.01	NS	P<0.01
Lamb wt (kg) -early	23.3	21.3	21.3	20.3
Lamb wt (kg) -late	20.6	18.6	20.1	17.8
Significance	P<0.01	P<0.01	NS	P<0.01
Litter wt (kg) -early	30.8	27.6	29.9	25.3
Litter wt (kg) -late	29.5	27.3	26.6	24.8
Significance	NS	NS	NS	NS

The 31 day difference in the start of mating resulted in a 27 day average (range 25 to 28 days) difference (P<0.001) in mean lambing dates. Average lambing date over the 4 years for the early ewes was August 8 (range August 6 to 9) and for the late ewes, September 4 (range September 3 to 5).

Analyses of lambing date variances showed that in the first 2 years the lambing spread of the early lambing ewes was significantly different from the late lambers (P<0.05). Over these 2 years, 75% of the early ewes lambed within a 19-21 day band centred on the median lambing date. The corresponding figure for the late ewes was 15-16 days. A similar but non-significant trend occurred in the last 2 years. There was no obvious evidence of a biphasic mating pattern from observations on lambing rate in the first 3 weeks of early lambing in any year.

Levels of GGT were above normal in both years and were remarkably similar across years at 74 - 75 iu/l for the early ewes and 98 iu/l for the late ewes. This difference between early and late groups was significant in year 4 only (P<0.05). In years 3 and 4, GGT tested as a covariate was non-significant except on the ratio of ewes lambing in year 4. Despite this, adding GGT as a covariate in year 4 had little impact on the fitted values.

DISCUSSION AND CONCLUSIONS

As a farm management tool, use of teaser rams in this project successfully advanced mating date of Romney derived ewes to March 1, one month earlier than their optimum period (Quinlivan and Martin, 1971). Compared to late mating, different variations on the theme were equally successful, namely :

1) Teaser rams with or without CIDRs used in ewes after the silent oestrous
2) Dorset vs Coopworth rams
3) Coopworth teaser rams primed or not by previous contact with oestrogen injected speyed ewes.

These findings are similar to others described by Smith *et al.,* (1989) although the biphasic pattern of mating in the first 3 weeks in teaser ram treated ewes described by Knight (1983) was not observed at lambing in this trial.

The absence of significance in tests on GGT was surprising given the degree of facial eczema observed in the late mate ewes in year 3 and the anomalous results of this group in Tables 1 and 2 for %ELM and %NLW. Typically, these traits are negatively associated with elevated GGT levels (Smeaton et al, 1985).

Finally, our work has demonstrated that a teaser ram to ewe ratio of 8%, without other aids, can reliably generate lambing starting on August 1. Mean lambing date will be 27 days earlier than that of ewes starting mating 31 days later. Lambing spread may be slightly wider, lambs will be fewer in number but heavier and litter weights will be similar to later lambing ewes.

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REFERENCES

Knight, T.W.; 1983. Ram induced stimulation of ovarian and oestrous activity in anoestrous ewes - a review. *Proceedings of the New Zealand Society of Animal Production* **43:** 7-11.

Quinlivan, T.D.; Martin, C.A. 1971. Oestrous activity and lamb production in the New Zealand Romney ewe. *Australian Journal of Agricultural Research* **22:** 497-511.

Sheath, G.W.; Webby, R.W.; Pengelly, W.J.; Boom, C.J. 1990. Finishing lambs in hill country. *Proceedings of the New Zealand Grassland Association* **51:** 181-186.

Smeaton, D.C.; Hockey, H.U.P.; Towers, N.R. 1985. Effects of facial eczema on ewe reproduction and ewe and lamb liveweights. *Proceedings of the New Zealand Society of Animal Production* **45:**133-135.

Smith, J.F.; Andrews, W.G.K.; Knight, T.W.; McMillan, W.H.; Quinlivan, T.D. 1989. A review of technology used for out - of - season breeding with New Zealand sheep breeds. *Proceedings of the 19th Seminar of the Sheep and Beef Cattle Society of the New Zealand Veterinary Association*. 169 - 189.

Towers, N.R.; Stratton, G.C. 1978. Serum gamma glutamyl transferase as a measure of sporidesmin-induced liver damage in sheep. *New Zealand Veterinary Journal* **26:** 109 - 112.

Webby, R.W.; Sheath, G.W.; Boom, C.J. 1990. Performance of new pasture cultivars in a hill country finishing system. *Proceedings of the New Zealand Grassland Association* **51:** 151-156.