

# Does targeted short-term grazing of lucerne increase twinning rates in unsynchronised Merino ewes?

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## Introduction

Reproduction is one of the key profit drivers in the sheep industry and increased reproductive output is needed to address the decline in sheep numbers in Australia to maintain supply to export markets (Curtis 2009). Increased nutrition around mating, or 'flushing', is a well-known means of increasing twinning rates. Studies using synchronisation methods have shown that short-term (acute) supplementation can increase prolificacy if targeted at days 9-14 of the oestrous cycle (Stewart and Oldham 1986). However, synchronisation involves increased chemical and labour costs, so may not suit extensive production systems. This study aimed to test whether an increase in twinning rate was possible using a short-term grazing of lucerne pasture in unsynchronised ewes.

## Methods

A trial was conducted on two properties located in Marrar and Walbundrie in southern New South Wales, commencing in February 2012. On each property, 280 or 200 Merino ewes, respectively, were randomly allocated to two replicates of two treatments: 1- live lucerne (flushed - *Medicago sativa*), or 2- cereal crop stubble (control - *Avena sativa* or *Triticum aestivum*), for seven days prior to ram introduction and for 7 days after ram introduction (Fig. 1). On day 7 of mating, ewes were removed from lucerne. Replicate 1 lucerne was boxed with replicate 1 stubble and replicate 2 lucerne was boxed with replicate 2 stubble.

Ewes grazed together on stubble from day 7 to 14 of mating. After day 14 of mating, within properties, all ewes were grazed together for the remainder of a six-week joining until pregnancy scanning (approximately 50 days after rams were removed). An estimated 65% of ewes mated during the first 17 days would have been flushed between days 10-14 of their oestrous cycle.

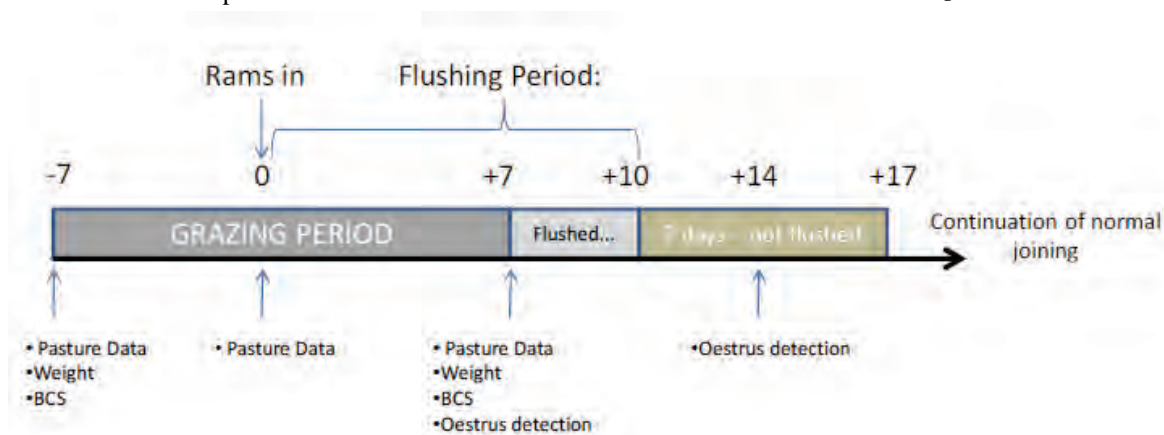
The mean quantity of live lucerne was above 1000 kg DM/ha throughout the grazing period. There was a minimum of 3800 kg DM/ha of dead herbage in the stubble paddocks during the same period.

## Results

Grazing lucerne compared with dead cereal stubble for 14 days significantly ( $P=0.003$ ) increased foetal numbers per ewe joined (Table 1). There was no difference ( $P>0.05$ ) between treatments in the proportion of ewes scanned as non-pregnant. The difference in foetal numbers observed was due to a higher ( $P=0.001$ ) proportion of ewes in the lucerne treatment carrying multiple foetuses.

## Discussion

Grazing lucerne for 14 days, commencing seven days before the introduction of rams, resulted in a 12% increase in foetal numbers, or a mean 18 extra lambs per 100 ewes joined, demonstrating that short-term flushing is effective in unsynchronised ewes mated during the natural breeding season. These results are comparable to other short-term



**Figure 1. Schematic diagram of trial methodology.**

**Table 1. Mean performance of ewes grazed on lucerne or cereal stubble.**

	Live lucerne	Cereal stubble
Start condition score	3.3	3.2
Number foetuses/ewe joined	1.68	1.50
% non pregnant ewes	6	5
% ewes with multiples (2+)	69	53

nutritional studies with synchronised ewes where ovulation, rather than foetal number, has been measured (Stewart and Oldham 1986; Nottle *et al.* 1997; King *et al.* 2010). Vinales *et al.* (2009), grazing pasture for 12 days prior to mating, recorded a trend for increased lambs born.

Keeping the duration of supplementation short reduces the risk of embryo mortality due to over-feeding (Morley *et al.* 1978; Parr *et al.* 1987) and also reduces the amount of feed required. To our knowledge, this is the first study examining short-term grazing of pasture in unsynchronised ewes. Targeted supplementation with lupin grain has previously been shown to be successful (Lightfoot *et al.* 1976), but the duration of feeding in that study was much longer (3.5 weeks).

### Conclusion

In comparison to dead herbage, grazing of live lucerne pasture for one week prior to mating and for the first week of mating can substantially increase twinning rates in unsynchronised ewes. Management of the survival of twin-born lambs is needed to maximise the benefits of this technique.

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### References

- Curtis K (2009) Recent changes in the Australian sheep industry (the disappearing flock). *Report for the Department of Agriculture and Food Western Australia*.
- King BJ, Robertson SM, Wilkins JF, Friend MA (2010) Short-term grazing of lucerne and chicory increases ovulation rate in synchronised Merino ewes. *Animal Reproduction Science* **121**, 242-248.
- Lightfoot RJ, Marshall T, Croker KP (1976) Effects of rate and duration of lupin grain supplementation on ovulation and fertility of Merino ewes. *Proceedings of the Australian Society of Animal Production* **11**, 5.
- Morley FHW, Kenney PA, Davis IF (1978) Predicting ovulation rate from liveweight in ewes. *Agricultural Systems* **3**, 27-45.
- Nottle MB, Kleemann DO, Grosser TI, Seamark RF (1997) Evaluation of a nutritional strategy to increase ovulation rate in Merino ewes mated in late spring-early summer. *Animal Reproduction Science* **47**, 255-261.
- Parr RA, Davis IF, Fairclough RJ, Miles MA (1987) Overfeeding during early pregnancy reduces peripheral progesterone concentration and pregnancy rate in sheep. *Journal of Reproduction and Fertility* **80**, 317.
- Stewart R, Oldham CM (1986) Feeding lupins to ewes for four days during the luteal phase can increase ovulation rate. [Conference paper]. (Pergamon Press).
- Vinales C, Meikle A, Martin GB (2009) Short-term nutritional treatments grazing legumes or feeding concentrates increase prolificacy in Corriedale ewes. *Animal Reproduction Science* **113**, 82-92.