

Exchange

Short-term flushing increases ovulation

Summer active perennials, (eg. lucerne) respond to rainfall year round. This creates opportunity for increased production and environmental gains. Grazing summer actives to increase ovulation rates and subsequent lambing percentages is an additional production benefit.



Twin lambs as the result of grazing on lucerne [inset] prior to ovulation

Exchange summary

- ▶ **Ovulation rate determines the potential number of lambs born**
- ▶ **Lucerne, chicory, green pasture or lupin supplements can lift ovulation rates in synchronised ewes**
- ▶ **Ovulation rate can be increased by 10% by flushing synchronised ewes**
- ▶ **Responses were obtained grazing low quantities of live pasture**
- ▶ **Evidence suggests the approach will work in unsynchronised ewes**

How flushing works

'Flushing' is providing short-term nutritional supplementation. The purpose of flushing in sheep is to obtain optimal ovulations in ewes, which could result in an increased lambing percentage (increased % of multiple births).

Traditionally, ewes are flushed for several weeks before joining. Research is now showing that ovulation rates can be increased with flushing for a period just over one week.

It is well known that increased nutrition of the ewe before joining increases the number of lambs born. Research in recent years suggests that energy is the nutritive factor of importance, although it is not clear exactly how it works. It is likely to be either an increase in the number of ovarian follicles which develop and ovulate (more eggs), or a reduction in the death of these follicles.

There are three mechanisms by which flushing increases ovulation rates:

- ▶ The 'static' effect - where ewes in better condition will produce more ovulations – about 1-3% per extra kg of liveweight at joining.
- ▶ The 'dynamic' effect - where ewes gaining condition at joining have more ovulations.
- ▶ The 'acute' effect of nutrition - where feeding for four to six days will increase ovulation rate without increasing liveweights.

This 'acute' effect of short-term flushing targets a critical period of the oestrous cycle between days 10 and 14, where ovulation occurs on day 17.

Research has shown that by synchronizing the oestrous cycle and flushing ewes with lupin grain feeding at 500g per day can increase ovulation rates by up to 54%.



Twin lambs can be achieved with increased ovulation rates

The benefit of short-term flushing over the traditionally longer periods is that the quantity and therefore cost of the feed is much reduced.

EverGraze research results

EverGraze research investigated the effects of short term grazing of live lucerne and chicory on ovulation rates in summer/autumn joined Merino ewes compared to the existing dead perennial pasture, phalaris with and without short term lupin grain supplementation.

The research trialled four different grazing treatments;

- ▶ phalaris (*Phalaris aquatica*),
- ▶ phalaris plus 500g lupin grain per ewe per day,
- ▶ lucerne (*Medicago sativa*),
- ▶ chicory (*Chicorium intybus*).

The study used 100 synchronised Merino ewes per treatment and was repeated over three years (2006, 2007 and 2008).

Lucerne and chicory are perennial pastures that provide good nutrition during summer and autumn when annual pastures have low nutritive value.

Lucerne is suited to medium and high rainfall areas and in addition to extending the supply of quality pasture, can be sown as a pasture phase in crop rotations to provide a disease break and fix nitrogen.

Chicory is more tolerant of acid soils than lucerne, providing an alternative where lucerne cannot be

grown. However, it is short lived and will only persist for two to four years.

2006 to 2008

For the trials from 2006 to 2008, oestrous cycles were synchronised using an intravaginal CIDR® inserted for 12 to 14 days. Nine days before the CIDR's were removed, the ewes were placed on one of the four grazing treatments. Ewes were removed from the grazing treatments when the CIDR's were removed

It was expected that the mean time of ovulation would occur approximately three days after CIDR's were removed. (see Figure 1).

Results - 2006 to 2008

Ewes grazing lucerne pasture achieved an average increased ovulation rate of 10% (see Figure 2). Chicory also produced greater ovulation rates than ewes on a diet of phalaris. The majority of multiple ovulations were twins; only 1.8% of ewes had triplets.

It is interesting that these results were achieved during extremely dry years where pasture availability was low (<1000kg DM/ha). Figure 3 shows more ewes had twin, rather than single, ovulations as the quantity of live pasture increased. Also, 90% of maximum response occurred with as little as 350 kg green/ha. So even a small amount of green live pasture on offer can increase ovulation rate.

Similarly, as the quantity of live pasture remaining at the end of grazing increased, there was an increase in the proportion of ewes with twin ovulations.

Figure 1. Timeline for synchronisation and grazing of treatments

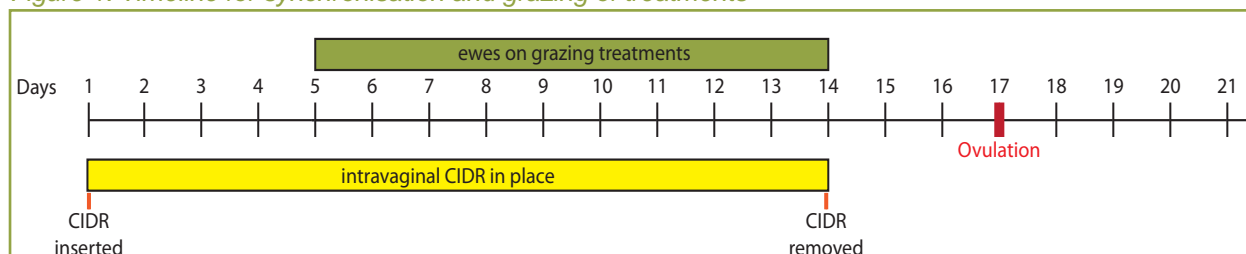


Table 1. Supporting Sites showing percentage of unsynchronised ewes scanned with twins

	Jugiong trial 1		Jugiong trial 2		Bookham		Yass	
	Lucerne	Control	Lucerne	Control	Lucerne	Control	Lucerne	Control
Twins %	44	34	38	43	67	20	20	21



Grazing lucerne prior to ovulation increases twinning rates

Larger quantities of live pasture above 350 kg/ha did not lead to much further rise in ovulation rate. However, under the drought conditions experienced the quality of larger quantities of pasture declined quickly (more stem) and in all years there was very little quality pasture left at the end of grazing. The ovulation rates achieved were below genetic potential. With better pasture, the ovulation rate could have been higher and would therefore differ from this study.

The response to lupins has been highly variable. The use of supplements is an additional cost which may be unnecessary if similar responses could be achieved using pasture.

Does short-term flushing work in unsynchronized ewes?

The research shows in principle, short-term flushing on live pasture is as effective as using lupin grain. Synchronizing ewes has advantages in providing short joining and lambing periods, which would allow targeted and more efficient use of feed resources. However, it involves additional costs (materials, labour, additional rams - 10% advised for synchronized joining), which need to be cost-effective. Could these costs be avoided if short-term flushing was effective in unsynchronized ewes?

2010

This was tested in 2010, where ewes were naturally joined on lucerne compared with dead phalaris pasture (had some live weeds). 100 ewes were grazed on each plot for eight days before rams were introduced for 28 days. The ewes and rams were removed from the pastures at the end of joining and ewes were pregnancy scanned. Trials were also conducted on four Supporting Sites with ewes grazing either lucerne or dead pasture during joining.

Results - 2010

The proportion of pregnant ewes in the first oestrous cycle (17 days) bearing multiple fetuses was similar between the lucerne and the phalaris groups. The high rates of

Figure 2. Mean ovulation rate (2006 - 2008)

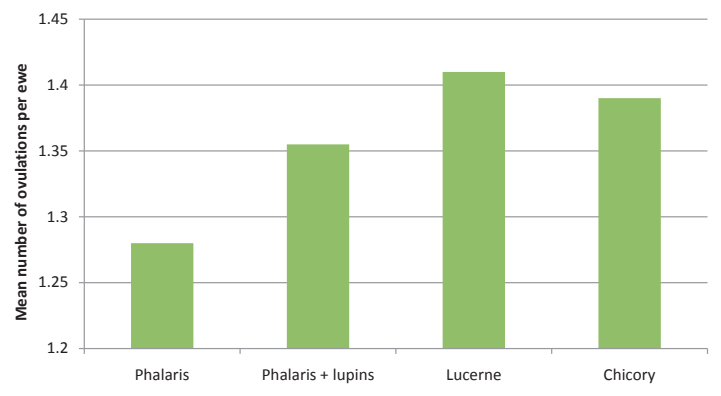
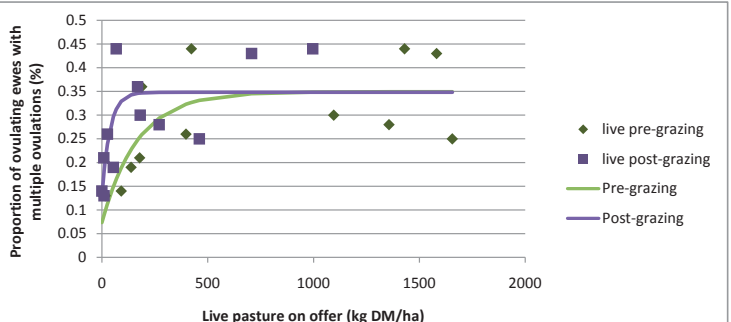


Figure 3. Number of ovulations on available live pasture



multiple lambs suggest both groups responded to live pasture so the results are inconclusive, but show that very high twinning rates can be achieved with ewes flushed on lucerne.

At the Supporting Sites the results (see Table 1) are variable, probably due to the amount of 'live' material in the control, and sometimes low quantities of lucerne. However one property in particular, at Bookham, showed a great response in the increased percentage of twins.

This result indicates that grazing ewes on live pasture at joining is likely to produce more lambs born compared with grazing dead pasture. The Bookham Supporting Site results also indicate that flushing ewes can result in up to 47 extra lambs born per 100 ewes joined, which is much higher than the 10% indicated by our trial work. This result may be due to a different quality of live pasture available or different ewe potential.

Optimal condition score and nutrition

Research shows that a response to short-term flushing is more likely if ewes are around condition score 3. Fat ewes are less likely to show a benefit, but could be expected to have a high ovulation rate due to their condition without the need for flushing. Medium-frame ewes are unlikely to be cycling if their liveweight is below around 40 kg.



Twin lambs at Wagga Wagga
Proof Site

Ovulation rate and lamb survival

An increase of 10% in ovulation rate from 1.3 to 1.43 translates to about 10.5 lambs born, allowing for 20% embryo mortality. The majority of extra lambs born will be twins, and if survival of twins is 70%, will result in seven extra lambs being marked per 100 ewes joined.

Because the mortality of twins is about three times that of singles, it is essential to ensure ewes are in at least condition score 3, have adequate high quality feed at lambing, and shelter is provided for new born lambs to optimize lamb survival, if the benefit of increasing ovulation rate is to be realised.

Short-term flushing in practice

The major benefit of short-term flushing is that less feed is required, compared with traditional flushing. In Autumn, when little quality pasture is available, it can be used to produce more lambs. The green feed quantities required for flushing are smaller than what is required to finish lambs.

The available data suggests the species of live pasture is not the driving factor – ovulatory responses were obtained with lucerne, chicory and other green feed.

Producers should avoid grazing lucerne infected with fungus or stressed by aphid attack. Under these conditions, lucerne will produce a chemical, coumestan, which can reduce ewe fertility.

Very high levels of nutrition in early pregnancy are also known to increase embryo mortality. Embryos are sensitive at days 11 and 12 after mating. A safe means of flushing ewes is to graze quality pastures for one week pre-joining and one week of joining. Then remove ewes from large quantities of quality pasture. The majority of ewes will be flushed in this time.

Conclusions

In synchronised ewes, both green lucerne and chicory increased the proportion of ewes with multiple ovulations compared with dry phalaris and produced a more consistent response than lupins.

Grazing unsynchronised ewes on green pasture at joining is also likely to increase the number of lambs born.

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Further information

EverGraze Exchange - Improving survival of lambs.

EverGraze Action – Using shrubs to provide shelter for lambing ewes.

Both publications are available at
www.evergraze.com.au

EverGraze on line: www.evergraze.com.au

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