

# Reducing mob size at lambing increases lamb survival

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## Introduction

At least 20% of lambs born still die prior to marking even when ewes are pregnancy scanned for multiples and nutrition is optimised according to best practice guidelines. Further work is therefore needed to identify additional strategies to improve marking rates. (Lockwood *et al.* 2019a). The existing guidelines of 100 to 250 adult twin-bearing ewes per mob at lambing could therefore represent a range in marking rate for twin-bearing mobs of over 10%. This report presents findings from national research funded by AWI and MLA which aimed to deliver improved recommendations regarding the allocation of ewes to mobs and paddocks at lambing, including the cost-benefit of investing funds in paddock subdivision to improve reproductive performance and farm profitability.

## Methods & Results

The research involved three experiments;

1. Research sites on 70 farms across WA, SA, VIC and NSW between 2016 and 2018 to test a 2x2 factorial combination of mob size (high or low) and stocking rate (high or low) on the survival of twin-born lambs of Merino or non-Merino breed.

**Table 1. Average and range in mob size and stocking rate for twin-bearing ewes of Merino and non-Merino breed which lambed at the high and low treatments at the 70 on-farm research sites for Experiment One**

		Mob size		Stocking rate (twin ewes/ha)	
		Average	Range	Average	Range
<b>Merino</b>	High	242	189 – 432	7.3	3.9 – 12.2
	Low	98	70 – 261	4.8	1.7 – 10.0
<b>Non-Merino</b>	High	243	188 – 510	8.1	5.0 – 11.2
	Low	97	70 – 210	5.9	3.1 – 8.1

The average and range in mob size and stocking rate for the high and low treatments are shown in Table 1. Ewe condition score at lambing averaged 3.1 for Merinos (range 2.4 – 3.9) and 3.2 for non-Merinos (range 2.5 – 3.8). Feed-on-offer (FOO) at lambing averaged 1520 kg DM/ha at Merino sites and 1720 at non-Merino sites, with FOO varying from 120 to 4180 kg DM/ha across the 70 sites. All ewes lambed in winter-spring. Most lambing paddocks were rectangular, flat to gently undulating with 1-2 watering points and limited shelter (<20% of paddock area) provided from trees. The average chill index throughout lambing was similar across the research sites, ranging from 881 to 1134 kJ/m<sup>2</sup>/h. Chill indexes exceeding 1100 kJ/m<sup>2</sup>/h present a higher risk of lamb mortality.

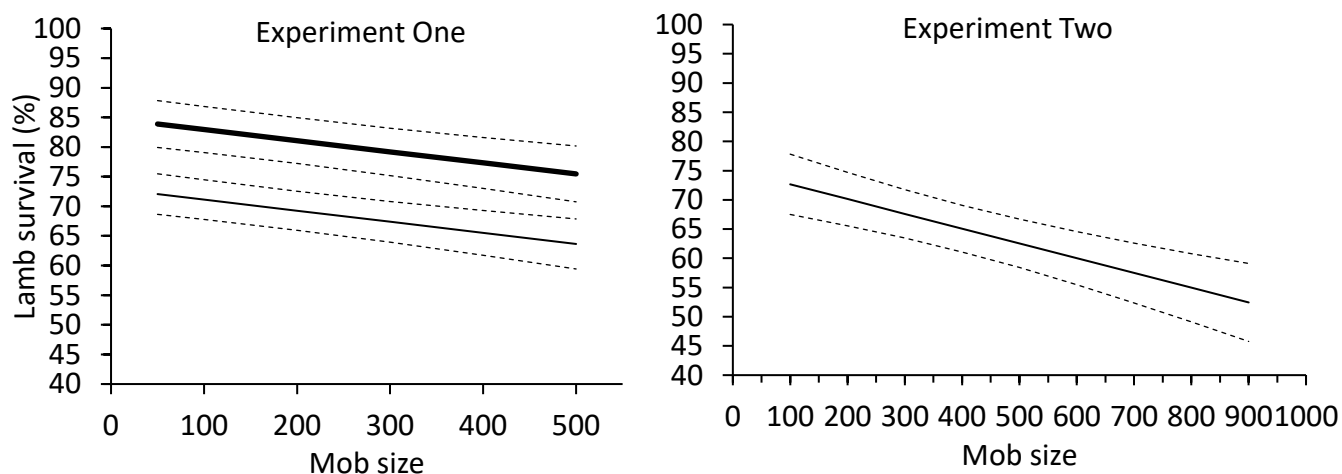
- Research sites on 15 farms across WA and NSW during 2018 to test the effect of mob size (high or low) on the survival of twin-born Merino lambs at low stocking rates

**Table 2. Average and range in mob size for the high and low treatments for twin-bearing Merino ewes at the 15 research sites for Experiment Two**

State	High mob size		Low mob size	
	Average	Range	Average	Range
NSW	763	639 – 976	435	338 – 554
WA	299	255 – 340	117	93 – 190

The average and range in mob size and stocking rate for the high and low treatments are shown in Table 2. The stocking rate of ewes across all sites was less than 4 twin-bearing ewes/ha, with average stocking rates of 0.5 twin ewes/ha in NSW and 2.9 twin ewes/ha in WA. The average condition score of ewes at lambing in NSW was 3.2 (range 2.9 – 3.4) and in WA was 3.1 (2.5 – 3.6). Feed-on-offer at lambing averaged 980 kg DM/ha in NSW and 550 kg DM/ha in WA, ranging from 220 to 2000 kg DM/ha across sites. All ewes lambed in winter-spring. Most lambing paddocks were square to rectangular and flat to gently undulating. The sites in WA typically had one watering point and limited shelter available in the form of trees. The sites in NSW typically had multiple troughs per paddock and increased shelter availability in the form of low vegetation which covered up to 50% of the paddocks. The average chill index throughout lambing ranged from 885 to 1025 kJ/m<sup>2</sup>/h across the research sites, similar to Experiment One.

- A network of 194 sheep producers who contributed data for 2174 lambing mobs between 2016 and 2018 to investigate the impacts of mob size and stocking rate on the survival of single- and twin-born lambs of Merino and non-Merino breed across a broad range of management and environmental conditions.



**Figure.** The effect of increasing the mob size of twin-bearing Merino ewes (thin lines) and non-Merino ewes (bold line) at lambing on lamb survival to marking

Lamb survival was poorer at higher mob sizes but not stocking rates. A linear relationship between mob size and lamb survival was identified where the survival of twin-born lambs decreased by between 2% and 2.5% for each

additional 100 ewes in the mob at lambing across the 85 on-farm research sites for Experiments One and Two (Figure).

Analysis of the data collected from producers across southern Australia showed that the survival of single-born and twin-born lambs decreased by 0.3% and 1.1% per additional 100 ewes in the mob at lambing. The relationships between mob size and lamb survival were not influenced by breed, ewe condition score at lambing, feed-on-offer at lambing or the characteristics of the lambing paddock for the experimental or survey components of the research.

Economic modelling showed that reducing mob size at lambing is justified even if paddock subdivision is required. However, the optimum mob size is influenced by several factors and hence the economic return from reducing mob size varies across specific scenarios (see Table 3). These factors include;

- **Cost of fencing and requirement for water**
  - ↓cost = ↓optimum mob size
- **Stocking rate**
  - When excluding the benefits of pasture utilisation, ↑SR = ↓optimum mob size
  - When including the benefits of pasture utilisation, the optimum mob size increases slightly with higher stocking rates because the benefits of reduced paddock size on increased pasture utilisation and potential stocking rate are nullified
- **Pregnancy status**
  - Optimum mob size for twins is 40-50% of that for singles
  - For ewes that are not pregnancy scanned or are scanned wet/dry, the optimum mob size is similar to that of twin-bearing ewes
- **Target return on investment**
  - ↑Return on investment = ↑optimum mob size
- **Breed** (smaller effect)
  - ↓optimum mob size for twin-bearing non-Merino ewes compared to Merinos
- **Lamb price** (smaller effect)
  - ↑lamb price = ↓optimum mob size
- **Capitalising on improved pasture utilisation** (↓optimum mob size)

### Conclusions & Recommendations

This national research has demonstrated that reducing mob size at lambing by 100 ewes will, on average, increase the survival of single-born lambs by 0.8% and twin-born lambs by 2.2%. This effect is observed regardless of Merino or non-Merino breed and was not influenced by stocking rate when ranging from 0.5 to 12 ewes/ha. Whilst FOO at lambing was not found to influence the effect of mob size on lamb survival in this national work, contrasting findings indicate that the effect of mob size on lamb survival may be greater when FOO is limited and ewes are supplementary fed during lambing (Lockwood *et al.* 2018; 2019b). This suggests that there may be a greater benefit

of reducing mob size when lambing in autumn or in poor seasons. Further work is needed to understand this relationship.

The economic return from reducing mob and paddock size at lambing is greater for twin-bearing ewes compared to single-bearing ewes. Smaller paddocks should therefore be prioritised for twin-bearing ewes. Greater returns can also be made from splitting larger mobs because current lamb losses are higher and thus there is increased opportunity to improve marking rates. Temporary fencing is a cost-effective way to reduce mob size, especially if the ewes don't require a water supply in the lambing paddock. However, the long-term benefits of improved pasture utilisation and therefore increased stocking rate will only be capitalised when paddocks are subdivided permanently. Overall, the findings from this national research will help improve marking rates by contributing to existing guidelines for improving lamb survival.

**Table 3. Optimum mob sizes for scenarios where Merino and non-Merino mobs stocked at 3.6 DSE/ha, 7.2 DSE/ha and 14.4 DSE/ha have been subdivided using permanent fencing with lamb price at \$6/kg and the benefits of pasture utilisation have been included, for a return on investment of 20% and 50%. For the analysis, twin-bearing ewes were rated as 1.8 DSE and single-bearing ewes as 1.5 DSE.**

		Twins		Singles	
		20%	50%	20%	50%
<b>Return on investment</b>		20%	50%	20%	50%
<b>Years to pay-off costs of subdivision</b>		5	2	5	2
<b>Merino</b>	3.6 DSE/ha	54	90	65	108
	7.2 DSE/ha	60	100	75	125
	14.4 DSE/ha	71	118	99	165
<b>Non-Merino</b>	3.6 DSE/ha	41	68	57	95
	7.2 DSE/ha	50	83	75	125
	14.4 DSE/ha	62	103	89	148

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