

Fact sheet

Mortality of triplet-bearing Merino ewes – what’s happening, when, why and how to mitigate the risks?



What’s happening on Australian sheep farms with triplet ewe loss?

Producers in Australia, that have been identifying and managing triplet bearing ewes separately have reported average mortality of triplet-bearing ewes to be 6.4%, regardless of ewe breed. By contrast the average mortality of twin bearing ewes was almost half that of triplets at 3.3% and the mortality of single bearing ewes was much lower again at 1.6% (see Table 1).

This level of triplet ewe loss limits the productivity of this cohort of ewes and in turn overall flock performance and it also represents an animal welfare challenge that needs to be addressed, especially given an increasing number of triplets are being conceived as reproductive rates (foetuses per 100 ewes) on Australian farms are rising. There were no differences in the average mortality of single, twin or triplet bearing ewes between ewe breeds (Table 1).

Table 1. Mortality of single, twin or triplet bearing ewes on Australian farms.

| Ewe mortality (%) | Average | 10th percentile | 90th percentile |
|-------------------|-------------|-----------------|-----------------|
| Single | 1.6% | 0.5% | 3.0% |
| Twin | 3.3% | 1.2% | 5.0% |
| Triplet | 6.4% | 1.8% | 14.5% |

When is the majority of triplet ewe loss happening on Australian farms?

The considerable nutritional demand of triplet-bearing ewes in late pregnancy and lactation is often not matched by increases in feed intake, especially under extensive grazing conditions, and is a likely contributor to mortality of triplet-bearing ewes and their lambs. Ewe nutrition during late pregnancy and resultant condition

score at lambing is known to be a determinant of ewe and lamb survival in both Merino and Maternal breeds, particularly in twin-bearing ewes as discovered by the Lifetime Wool and Lifetime Maternals Projects. This triplet research project has determined the impact of late pregnancy nutrition and condition score at lambing on the survival triplet dams and their lambs for Merinos. Most of the triplet ewe loss occurs in late-pregnancy and during lambing, and loss rates are greater:

- when CS at lambing is lower – for Merinos 1 CS lower at lambing increased ewe mortality by 3.5%, and there is no evidence that fatter ewes up to CS 4 die at a greater rate (Figure 1)
- when Merino ewes are of older age (4 years and older) – Merino triplet ewe mortality is increasingly greater than twins (Figure 2).

Figure 1. Impact of CS at lambing on mortality of triplet-bearing Merino ewes between pregnancy scanning and lamb marking.

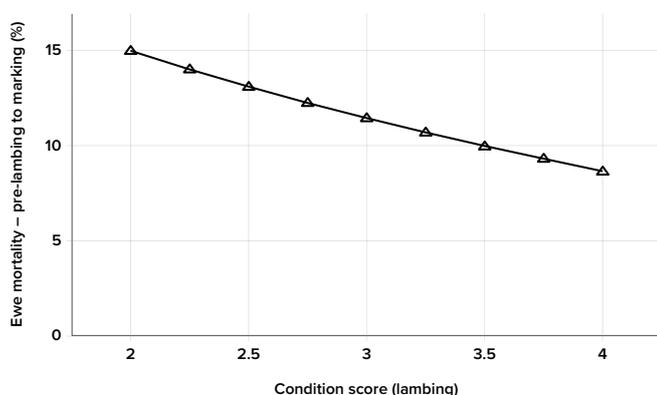
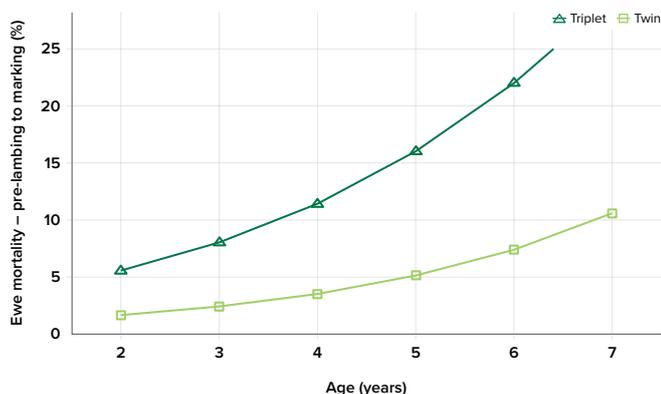


Figure 2. Impact of ewe age on mortality of twin and triplet-bearing Merino ewes on ewe mortality between pregnancy scanning and lamb marking.



Why triplet ewe loss is occurring – pregnancy toxemia

Pregnancy toxemia is basically due to lack of energy in late pregnant ewes when the foetuses take more energy than the ewe can provide. The lack of energy is caused by a combination of poor feed in late pregnancy (insufficient energy density of ration), decreased rumen capacity and a dramatic increase in energy requirements. The energy requirement for a ewe with triplets lambs in the last few weeks is more than double maintenance.

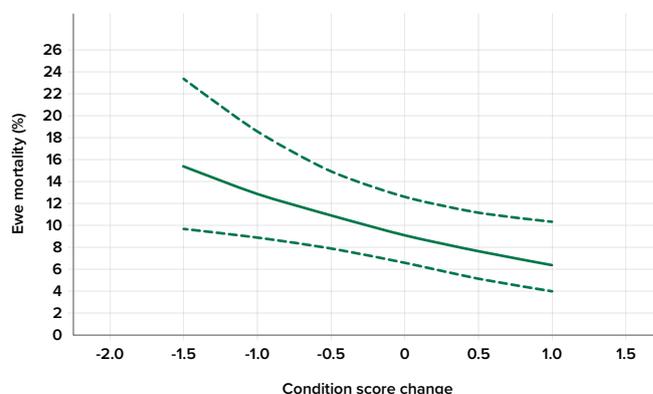
To provide energy, the ewe starts to breakdown body reserve especially fat, however, the liver cannot cope.

The blood sugar (glucose) levels fall dramatically, and the ewe does not have enough energy to function normally – especially the brain, muscles and there is kidney damage. Glucose (energy) is essential for proper brain function; a deficiency will result in nervous dysfunction and eventually coma and death. Glucose is also required for the muscles during grazing, deficiency leads to a drowsy ewe with a reduced appetite, while the foetuses are demanding more and more glucose. For more information visit beeflambnz.com/knowledge-hub/PDF/metabolic-diseases-ewes.pdf

When triplet ewes are in negative energy balance (precursor for pregnancy toxemia) and losing condition score in late pregnancy their risk of death escalates;

- -1 CS compared to maintenance increases mortality of triplet-bearing Merino ewes by 3.8% (Figure 3).

Figure 3. The effect (± 95% confidence intervals; dotted lines) of the change in condition score (CS) of triplet-bearing Merino ewes between pregnancy scanning and pre-lambing on their mortality to marking at 7 commercial research sites across southern Australia between 2019 and 2021. The average CS at pregnancy scanning was 3.3 (range 1.5–4.5).



How to minimise Merino triplet ewe loss?

Adult Merino ewes were allocated to a 'high' or 'low' condition score treatment after pregnancy scanning. Nutritional management after scanning aimed for the condition score of ewes in the high and low treatments to differ by at least 0.3 of a condition score at lambing. The condition score treatment concluded at around day 130–135 of pregnancy when the ewes were allocated to similar lambing paddocks regardless of late pregnancy treatment (average FOO at pre-lambing allocation was 1,500 kg DM/ha). Ewe survival was measured to lamb marking (Table 2).

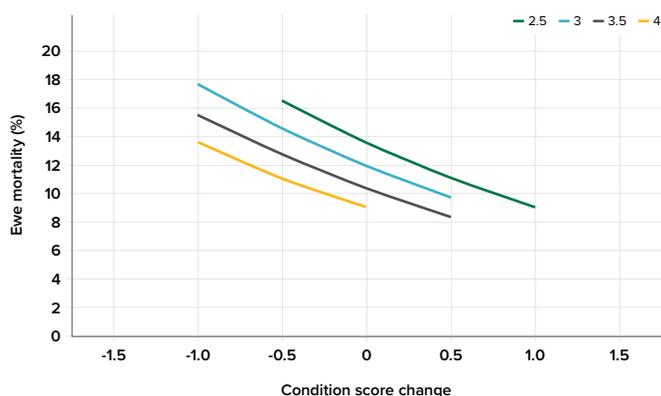
Table 2. Average condition score (CS) at pregnancy scanning, lambing and lamb marking for mobs of Merino ewes managed at the 'low' and 'high' CS, and ewe mortality between lambing and marking.

| | Low CS | High CS |
|---|--------------------|--------------------|
| CS at scanning | 3.3 (3.0 – 3.6) | 3.3 (3.0 – 3.7) |
| CS at lambing | 2.9 (2.4 – 3.1) | 3.3 (2.8 – 3.6) |
| Change in CS scanning to lambing | -0.4 | 0.0 |
| Ewe mortality during lambing | 11.4% | 4.2% |
| CS at marking | 2.8 (2.5 – 3.3) | 2.9 (2.5 – 3.3) |

Key findings in relation to the impact of condition score in late pregnancy on Merino triplet mortality:

- Mortality of Merino ewes decreased when managed to high CS from scanning to lambing.
- Gaining condition score between pregnancy scanning and lambing improved Merino ewe survival rates regardless of starting CS at scanning (Figure 4), where gaining 0.5 CS from scanning to lambing reduced ewe death by at least 2%.
- For triplets lambing at CS 3.5, the profile of CS 3.0 at scanning and gaining 0.5 CS to lambing achieves lower ewe mortality than the profile of CS 4.0 at scanning and losing 0.5 CS to lambing.

Figure 4. The impact of CS at pregnancy scanning and change in CS from pregnancy scanning to lambing on mortality rate (%) of triplet-bearing Merino ewes.



Economics

The analysis focused on determining the optimal CS profile of triplet-bearing ewes when the flock is scanned for litter size, allowing triplet-bearing ewes to be managed separately from twin-bearing ewes after scanning. When ewes are not scanned for litter size, the triplet-bearing ewes are expected to be about 0.2 CS lower than the twin-bearing ewes at lambing.

The recommended targets for absolute CS at lambing for Merino ewes is for single-bearing ewes to be at CS 3.0, with some latitude to be lower, the target for twin-bearing ewes is CS 3.3 and the target for triplet-bearing ewes is CS 3.5 (Table 3).

Table 3. Recommended CS targets for Maternal ewes at lambing for single, twin and triplet-bearing ewes.

| | Ewe litter size | | |
|--------------------|-----------------|------|---------|
| | Single | Twin | Triplet |
| Merino ewes | 3.0 | 3.3 | 3.5 |

The recommended CS for triplet-bearing Merino ewes at lambing relative to the twin-bearing ewes is to be 0.2 CS higher than twin-bearing ewes. The twin-triplet gap in condition score is greater than the optimal profit targets identified in the economic modelling and this management buffer has been included because of the mortality risk of Merino triplet-bearing ewes and their lambs and their greater sensitivity to CS at lambing than twin bearing ewes. The slight reduction in profit from being 0.2 CS heavier is offset by changes in ewe mortality (2–3%) and is justified on risk management and animal welfare grounds.

At reproduction rates of 170%, which includes 10% triplets, differential management of Merino flocks increased profit by \$0.80 per ewe scanned or \$8/triplet-bearing ewe identified. On average, 30% of the benefit of identifying the Merino triplet-bearing ewes is from the differential nutrition outlined above and 70% of the benefit is from differentially allocating to lambing paddocks.

What are the best practice key messages for Maternal triplet bearing ewe loss?

- Currently, triplet-bearing Merino ewes on commercial farms are dying at about double the rate of twin bearing ewes, even when being identified at scanning and differentially manage.
- Most of the triplet ewe loss occurs in late-pregnancy and during lambing.
- Triplet ewe mortality rate is greater when CS at lambing is lower – target CS 3.5 at lambing.
- Triplet ewe mortality rate is greater when Merino ewes are of older age (4 years and older).
- Triplet ewe mortality rate escalates when ewes are in negative energy balance and losing condition score in late pregnancy, primarily due to pregnancy toxaemia.
- Gaining CS between pregnancy scanning and lambing improves triplet ewe survival regardless of starting CS.
- Manage triplet ewes separate from twins from scanning, so triplets lamb 0.2 CS higher than twins, rather than 0.2CS lower that would have occurred if triplets were left with the twins.
- The recommended targets for absolute CS at lambing for Merino ewes is CS 3.0 for single-bearing ewes, CS 3.3 for twin-bearing ewes and CS 3.5 for triplet-bearing ewes.
- For a flock with 10% triplets, differential management (nutritional management and lambing paddock allocation) of triplet bearing ewes increases profit by about \$0.80/ewe scanned or \$8/triplet bearing ewe after the costs associated with scanning, labour and supplementary feeding.

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