Management to improve lamb survival

Susan Robertson
What is normal?

• 20% of lambs die (10% of singles, 30% of twins)

• 90% of lamb deaths within 7 days of birth

• On-farm range in mortality: 4 to 50% of singles
  15 to 85% of twins

Most at risk: Merino, multiple births, from maidens
## Why do lambs die?

<table>
<thead>
<tr>
<th>Cause of death</th>
<th>% of all deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>Starvation/exposure/mismothering/lambing difficulty</td>
<td>80</td>
</tr>
<tr>
<td>Primary predation</td>
<td></td>
</tr>
<tr>
<td>Infection</td>
<td>20</td>
</tr>
<tr>
<td>Deformities</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
</tr>
</tbody>
</table>

Target the major causes to improve survival
Adequate nutrition is critical

- Condition score 3.0
- 1200 kg DM/ha + (green)

Fig. 2. Mortality of twin but not single lambs was inversely related to condition score of ewes prepartum.

Source: King et al (1990) ASAP 18, 272
Short-term feeding to increase colostrum

• 0.5 kg/ewe/day (lupins, maize, barley) for 7 days before lambing ↑ colostrum

• 7 days before + first 7 days of peak lambing ↑ survival by 7%+

• Ineffective where ample green pasture

• Response is variable - Calculate cost vs extra lamb value
Is exposure to weather a risk?

• Exposure contributes to 60% of lamb deaths (SME)
• Hot weather? Provide shade, minimise distance to feed/water
• Cold, wet, windy weather:
  critical level: chill index > 1000 kJ/m².hour

Proportion of lambs dying due to chill at different lambing dates at Ginninderra

--- Twins
--- Singles
Source: Donnelly et al (1984) AJAR
Likelihood of median daily chill index exceeding 1000 kJ/m².hr for 24 weekly periods from May to October with 0 (●●●●), 25 (○○○○), 50 (▼▼▼▼), 75 (●●●●) and 100 (■■■■) % wind speed reduction at different locations.

The potential for shelter to reduce chill index differs with location and month.

Reducing wind speed has a much larger effect on the incidence of high chill days at windy locations.

Can shelter from wind improve survival?

• Paddock shelter alters \textit{wind speed}, not rain or temperature

• Lambing in cold, windy weather

• Benefits more likely in twins, Merino

• At Tarcutta (Jul/Aug):
  Shrub shelter 77\% survival of twins, hessian 70\%
  No increase in single lambs

• At Hamilton: 50\% increase in survival with tall grass rows
  singles and twins

• Shearing pre-lambing?
Economics of shelter

- The profitability of shelter depends on the cost of shelter, the twinning rate, and how much survival is increased.

Percentage increase in lamb survival required to obtain a positive NPV from shelter

Base survival 60%

(Source: Broster 2014)
Natural shelter can be cheap

Consider opportunity costs of lost grazing
Does high stocking density reduce lamb survival?

- 14.3 ewes/ha or 143 ewes/ha - same lamb survival (Winfield 1970)
- 2.9 ewes/ha to 23.9 ewes/ha – same lamb survival but optimum flock size 400 ewes (Kleemann et al 2006)

But…

<table>
<thead>
<tr>
<th>8 or 15 twin-bearing ewes in 0.5ha =</th>
<th>16 ewes/ha</th>
<th>30 ewes/ha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proportion lamb survival of live births</td>
<td>0.83 a</td>
<td>0.63 b</td>
</tr>
</tbody>
</table>

Source: Robertson et al (2012)

- AWI currently funding mob size research
Maternal experience: maidens 10% lower survival

Can lamb survival from maiden ewes be increased through pre-lambing exposure to adult lambing ewes?

<table>
<thead>
<tr>
<th></th>
<th>Exposed</th>
<th>Not exposed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proportion lamb survival</td>
<td>0.53</td>
<td>0.61</td>
</tr>
<tr>
<td>Lambs marked/ewe</td>
<td>0.71</td>
<td>0.78</td>
</tr>
</tbody>
</table>

Source: Robertson et al. in press

Lamb maidens in separate paddocks from mature ewes.
Conclusions

• Relatively simple management changes can improve lamb survival
• Target management for specific conditions
• Consider the cost: benefit of strategies, and opportunity costs
An alliance between Charles Sturt University and NSW Department of Primary Industries

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