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Why fat score breeding ewes?

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The need for nutritional management

Optimal nutritional management of the breeding ewe flock provides an opportunity to maximise ewe and lamb survival, wool production and the wool quality potential of future generations of Merino sheep.

Reaching fat score targets during the reproductive cycle will lead to:

- improved ewe reproduction
- increased progeny fleece weight and lower fibre diameter
- increased lamb survival
- improved ewe health and survival
- increased ewe wool production
- more effective use of feed resources.

Ewe nutrition during pregnancy and lactation must be sufficient to satisfy her own needs for maintenance and wool growth as well as supply adequate nutrients to the foetus during pregnancy and then to the lamb during lactation.

The nutrients available to the foetus during late pregnancy in particular can have an impact on the development of the wool follicle population. Lambs whose mothers are inadequately fed during late pregnancy as well as the progeny of young ewes and twin lambs will develop fewer secondary follicles. This will reduce their adult wool-producing capacity.

Reproduction rate and survival are key drivers

The biggest impact of nutrition during pregnancy is on ewe reproduction rate and progeny survival, particularly that of twins. The fat score of breeding ewes at joining ultimately sets the potential number of lambs to be born into the flock from that joining: ewes in better condition at joining conceive more lambs (Primefacts 151 *Fat score of ewes at joining: the benefits of optimal nutrition*, and Primefact 308 *Maiden Merino ewe conception rates*). While how you manage the breeding flock during pregnancy will effectively determine how many of these 'potential lambs' are born and survive to weaning and beyond, where they will generate a financial return for your enterprise.

The importance of fat score targets

Monitoring breeding ewes is essential to enable timely management decisions. If you aren't regularly assessing the fat score of your flock, your ability to fine-tune management to optimise the production outcomes from your flock will be limited.

Fat scoring ewes at critical stages of the reproductive cycle in conjunction with regular pasture assessment will allow preparation of accurate feed budgets ensuring the differing nutritional demands of the ewes at various stages of the reproductive cycle are met in the most cost effective manner. Regular assessment of available pasture is vital as it will determine how the fat score of your breeding ewes will change over time.

Routine fat scoring of a random sample of breeding ewes will allow you to clearly identify how the flock is tracking relative to the recommended fat score targets at critical times of the breeding cycle.

Fat scoring about 10% of the mob whenever your ewes are yarded would be ideal. However, it is recommended you fat score at least twice during the reproductive cycle as follows.

1. **Weaning**. Between weaning and joining is the key period for ewes to recover any lost condition in preparation for their next joining. This is the most critical fat scoring. Ewes can be drafted into mobs based on their fat score at weaning (say below 2.5 and above 2.5) and allocated to available pasture accordingly. This should result in less variability in fat score and allow pastures to be utilised more efficiently.
2. **Mid-pregnancy**. At this time the nutritional requirements of single and twin bearing ewes

begin to differ. This assists the early preparation of lambing paddocks and allocation of lambing mobs.

In addition, fat scoring pre-lambing can help you to decide which lambing paddocks to allocate to which ewes.

Fat scoring at these times will allow you to accurately manage the feed requirements of the ewes, which change at each stage of pregnancy.

Predicting ewe and progeny performance

The Lifetime Wool project has developed mathematical equations relating ewe fat score during pregnancy to ewe wool production and quality, reproduction and mortality, as well as progeny wool production, wool quality and survival. For the first time, we can now predict the production consequences of managing ewes to different fat scores at critical stages during pregnancy.

The impact of ewe nutrition profiles during pregnancy on ewe and progeny performance are summarised in Table 1. The ewe and progeny performance for ewes maintained at fat score 3 for the duration of pregnancy are highlighted in **bold** in the table. These production outcomes are for a standard reference weight of 45 kg or a fine bloodline (Standard Reference Weight or SRW is approximately the liveweight that would be achieved when skeletal development is complete and the animal is at score 3 fasted and fleece free).

Maintaining ewes at fat score 3 during pregnancy

A ewe maintained at fat score 3 for the duration of pregnancy would be expected to cut 4.1 kg of clean wool with a fibre diameter of 20.5 µm. These ewes would have a reproduction rate (lambs scanned per 100 ewes) of 119.9% and a mortality rate of 1.1%. Their progeny would cut 3.2 kg of clean wool with an average fibre diameter of 17.8 µm. The survival rates of single and twin born progeny from ewes maintained at fat score 3 would be 91 and 71% respectively.

Managing ewes at fat score 2.5 during pregnancy

In comparison, a ewe maintained at fat score 2.5 for the duration of pregnancy would cut 3.8 clean kg (–0.3 kg) of 20.3 µm (–0.2 µm) wool, have a lower reproduction rate of 109.1% (–10%) but a similar mortality rate. While her progeny would have a similar fleece weight and fibre diameter for the fat score 3 ewe, their survival rates would be lower, 86.3 % for singles (–5%) and 59.6 for twins (–11.7%).

Table 1. Impacts of fat score profile throughout pregnancy on ewe and progeny production.

Joining Fat Score			2			2.5			3			3.5			4
Day 90			2	2.5		2	2.5		2	2.5	3	2	2.5	3	
Lambing			2	2.5	3	2	2.5	3	2	2.5	3	2	2.5	3	3.5
Ewe production															
CFW	kg		3.5	3.8	4.2	3.5	3.8	4.2	3.4	3.7	4.0	3.6	3.9	4.3	4.7
FD	µm		19.8	20.2	20.7	19.9	20.3	20.7	19.8	20.3	20.7	20.3	20.7	21.1	21.3
Reproduction rate	%		109.1	109.1	109.1	109.1	109.1	109.1	119.9	119.9	119.9	131.1	131.1	131.1	131.1
Mortality	%		4.4	1.0	0.9	4.4	1.0	0.9	4.6	1.8	1.1	1.9	1.3	1.3	0.9
Progeny production															
CFW hog	kg		3.1	3.2	3.3	3.1	3.2	3.3	3.0	3.1	3.2	3.0	3.1	3.2	3.3
FD hog	µm		18.0	17.7	17.5	17.9	17.7	17.5	19.0	17.9	17.7	18.1	17.9	17.8	17.6
Survival singles	%		78.2	88.7	93.8	74.6	86.3	93.8	72.7	85.0	93.0	80.6	90.3	96.2	98.5
Survival twins	%		42.8	65.0	78.1	36.1	59.6	78.1	32.6	56.7	75.9	47.6	68.8	85.2	94.6
Joining Fat Score			2.5			3			3.5						
Day 90			2	2.5	3	2	2.5	3	2	2.5	3				
Lambing			2	2.5	3	2	2.5	3	2	2.5	3	3.5	4		
Ewe production															
CFW	kg		3.5	3.8	4.2	3.8	4.1	4.4	3.7	3.8	4.0	4.3	4.7		
FD	µm		19.9	20.3	20.7	20.5	20.3	21.2	20.3	20.3	20.7	21.1	21.3		
Reproduction rate	%		109.1	109.1	109.1	119.9	119.9	119.9	119.9	119.9	119.9	131.1	131.1		
Mortality	%		4.4	1.0	0.9	1.1	1.8	0.8	1.8	1.8	1.1	1.3	0.9		
Progeny production															
CFW hog	kg		3.1	3.2	3.3	3.2	3.1	3.3	3.1	3.1	3.2	3.2	3.2		
FD hog	µm		17.9	17.7	17.5	17.8	17.9	17.6	17.9	17.9	17.7	17.8	17.8		
Survival singles	%		74.6	86.3	93.8	91.3	82.2	96.7	85.0	82.2	93.0	96.2	94.9		
Survival twins	%		36.1	59.6	78.1	71.3	50.8	87.1	56.7	50.8	75.9	85.2	81.3		

Tracking progress – impacts are additive

You can use this same process to track ewe and progeny performance from a joining fat score of 2.5, 3 or 3.5 and then losing, maintaining or gaining condition between day 90 and lambing. This is

possible as the effects of ewe fat score are additive. This means the impacts of ewe nutrition in early to mid pregnancy can be added to the impacts of nutrition in late pregnancy. Losing fat score during early to mid pregnancy and then regaining that lost condition by lambing gives the same net result as maintaining the ewes' nutrition level and hence fat score over the whole of pregnancy.

Commercial reality

The production responses in Table 1 were derived from intensive small plot research in western Victoria and the south-west of Western Australia. However larger scale comparisons involving 1,000 breeding ewes at 18 paddock-scale sites across southern Australia have backed up these findings.

For the ewe production traits the effects per kilogram of ewe liveweight change were very similar to those from the plot-scale sites. The impact of ewe nutrition on progeny survival from the paddock-scale sites was also very similar to that of the plot scale work. However there was some variation in the progeny wool production and quality with the paddock-scale results being between ⅓ and ⅔ those of the plot scale findings.

Biology versus economics

From a biological view point, maintaining breeding ewes in fat score 3 for the duration of pregnancy and lactation maximises production outcomes. However, there is a trade-off between the level of production and the economic cost of achieving that level of production. The cost of changes in grazing management or the level of supplementary feed required to achieve and maintain ewes at fat score 3 needs to be assessed against the additional value of production of both the ewes and their progeny.

Costing nutritional decisions

The ewe and progeny performance information at each of the fat score profiles in Table 1 is a valuable tool to assist with nutritional decisions regarding breeding ewes at critical stages of the reproductive cycle.

The relative performance of ewes joined at either fat score 2.5, 3 or 3.5 is clear – ewes in better condition at joining cut more wool, and have higher reproduction rates and lower mortality. When supplement prices are high (remember to make an allowance for purchase, cartage and feeding out) you can estimate the cost and predict the consequences of not feeding ewes post-weaning to increase fat score at joining.

Improving reproduction rate

The responsiveness of reproduction rate in your flock to a change in fat score will be a major input into your decision. While it may pay to feed a highly responsive flock (say, +12–15 additional lambs per 1 fat score increase at joining) the benefit to a low or non-responsive flock (say, +3 or lower additional lambs) would be questionable (Primefact 309, How responsive is the conception rate of your Merino ewes?).

Ewe management in late pregnancy

Fat scoring a random sample of ewes when they are yarded for pregnancy scanning at about day 90 will allow you to track their progress. If the ewes have dropped condition you can decide to maintain them at that lower fat score or improve their available nutrition by either moving them to a better paddock or offering some form of supplementation. Again you can use the information in Table 1 to determine the production consequences of either option and calculate the cost:benefit of providing supplementation.

Remember that adequate nutrition for twin bearing ewes is vital during the latter stages of pregnancy – survival rates of twin born progeny from ewes that lose condition during late pregnancy can fall to below 50%. It is worth considering offering additional feed (pasture or supplements) to lightweight twin bearing ewes following scanning to allow them to improve condition as they approach lambing.

Drafting into lambing mobs

You can use the same decision process if you fat score when drafting ewes into lambing mobs. Use this information, along with their pregnancy status, to allocate ewes to lambing paddocks and decide whether the available pasture is sufficient to meet their needs or if supplementation is warranted.

Again the focus should be on twin-bearing ewes – they must have sufficient available pasture and body reserves to support the relatively greater lactation demand of suckling two lambs.

Paying attention to detail

Management of breeding ewes is about paying attention to detail at all stages of the breeding cycle. Regular monitoring of ewe fat score at critical stages allows you to track ewe progress against targets and to make informed decisions regarding their nutritional status (requirements versus feed availability). Active management of breeding ewes during pregnancy is the key to success!

Further reading

See http://www.dpi.nsw.gov.au/agriculture

Primefact 151, *Fat score of ewes at joining: the benefits of optimal nutrition*

Primefact 308, *Maiden Merino ewe conception rates*

Primefact 309, *How responsive is the conception rate of your Merino ewes?*

Primefact 302 *Fat scoring sheep and lambs*

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