NEW SOUTH WALES
LIFETIMEWOOL
MAXIMISING THE GENETIC POTENTIAL OF YOUR FLOCK

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INSIDE

HIGHLIGHTS

The benefits of optimal nutrition at joining

The benefits of optimal nutrition at joining

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Conception rate increases with increasing fat score due to relationships that exist between fat score, bodyweight and ovulation rate (see Volume 1 Issue 2 April 2005 of this newsletter). Fat score, bodyweight and pregnancy scanning data from both the 2004 and 2005 joining at the three NSW paddock-scale sites (Carwoola, Kialami and Oak Hills) were analysed to explore the relationships between these three traits in more detail. The aim of the analysis was to answer the following questions:

- What is the relationship between fat score at joining and conception rate? How many more lambs will I get if my ewes are in better condition at joining?
- What is the relationship between bodyweight at joining and conception rate? How many more lambs will I get if my ewes are heavier at joining?
- What is most important at joining, fat score or bodyweight?
- Does a change in fat score or bodyweight prior to joining have an impact on conception?

What is the impact of previous lambing on a subsequent pregnancy? Are dry ewes consistently dry? Do twin bearing ewes tend to continue to bear twins?

Fat score at joining and conception rate

Across all three NSW sites fat score had a significant impact on conception rate (lambs scanned /100 ewes) (Fig. 1). Ewes with higher fat scores at joining conceived more lambs than ewes in poorer condition at joining. An increase of 0.5 fat score (ie from 1.5 to 2 or from 2.5 to 3) resulted in an extra 6-7 lambs scanned per 100 ewes, while an increase of 1 fat score generated an extra 13 additional foetuses per 100 ewes scanned.

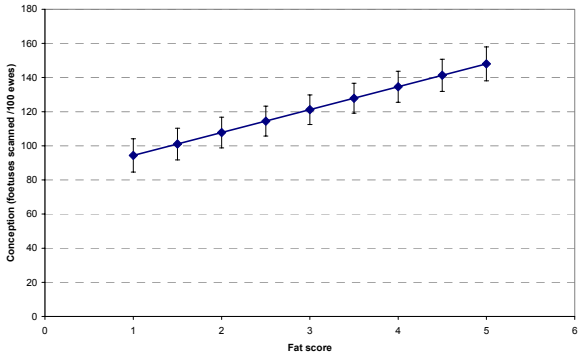

Figure 1: Conception rate increases linearly with increasing fat score.

Bodyweight at joining and conception rate

Bodyweight at joining also had a significant impact on conception rate (Fig.2). However, for bodyweight, the relationship was curvilinear. This means that as bodyweight increases so to does conception rate, but the number of extra lambs scanned per kg of ewe bodyweight decreases and actually begins to decline at higher bodyweights.

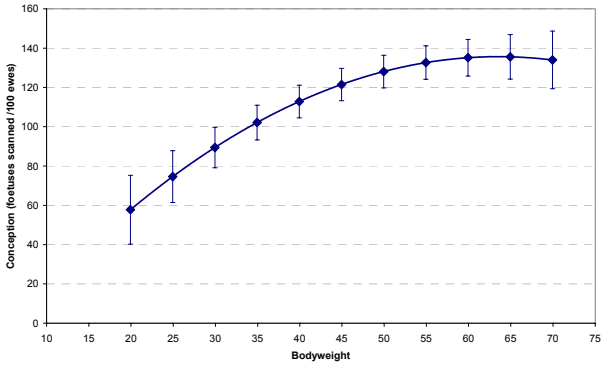

Figure 2: Conception rate has a curved relationship with increasing bodyweight.

For the data from the three NSW sites, increases of approximately 10 kg bodyweight up to about 45 kg lead to

higher conception rates per kg of ewe bodyweight. But as bodyweight increased further, the conception rate per kg of ewe bodyweight was smaller and began to decline at about 55-60 kg. For the ewes at the three NSW paddock-scale sites, conception rate was maximised when the ewes were 63 kg at joining.

So what is more important at conception - fat score or bodyweight?

The analysis indicates that the relative impacts of bodyweight and fat score on conception rate are similar. The important point to remember is that fat scores, and hence the relationship between fat score and conception, are transferable across flocks and bloodlines as they are not affected by differences in mature body size. This is clearly not true for bodyweight which varies between flocks and across bloodlines due to differences in frame size between flocks and bloodlines. The ewes in this analysis were all superfine and fine bloodlines, therefore the relationship between bodyweight and conception outlined above would not be applicable to medium and broader bloodlines.

The relationship between fat score and conception rate for the three NSW sites showed an even response of 13 foetuses for an improvement of 1 fat score across the entire range from score 1 to score 5. This suggests that drafting off the thinner ewes and giving them preferential treatment would be of no value to the average conception rate of the flock. However, if the bodyweight relationship is also taken into account, then there is value in holding the higher fat score ewes (ie maintaining their condition) and allowing the lighter ewes in the mob the chance to increase their fat score.

Does a change in fat score or bodyweight prior to joining have an impact on conception?

Neither fat score nor bodyweight changes (loss or gain) of the ewes between weaning in 2004 to joining in 2005 or in the month prior to joining had a significant influence on conception at the 2005 joining. Therefore the length and degree of condition or bodyweight loss or gain during either of these periods had little impact on the number of lambs scanned. It didn't seem to matter how the ewes reached their fat score at joining, only that they got there!

Nevertheless, the timing of the fat score increase is best done prior to the introduction of the rams. However, preliminary economic analyses suggests that supplementary feeding to increase fat score for improved conception is rarely profitable although this will depend on the responsiveness of conception rate within your flock. The latest results from the national Lifetime Wool project team suggest that an average of an extra 20 lambs are *born* per 100 ewes for each additional *condition* score (ie assessed at the 'C' site over the back bone and short ribs) at joining. However it is important to note that the national range was 5 to 40, indicating that variation does exist in the responsiveness of reproduction rate of different flocks.

Where your flock sits within this range will have a large impact on the cost-effectiveness of managing ewes to achieve fat score targets at joining (ie a +30 flock can economically be fed more than say a +10 flock). Despite this it will always be far better to achieve fat score targets at joining through management of ewe fat score from weaning using available pasture.

What is the impact of a previous lambing on a subsequent pregnancy?

Ewes that are dry are less likely to conceive at their next joining (Fig. 3). This is independent of their fat score or bodyweight at the subsequent joining. In other words a dry ewe will tend to remain dry regardless of her fat score or bodyweight at joining. Similarly there was a trend for twin bearing ewes to continue to conceive twins at their subsequent joining.

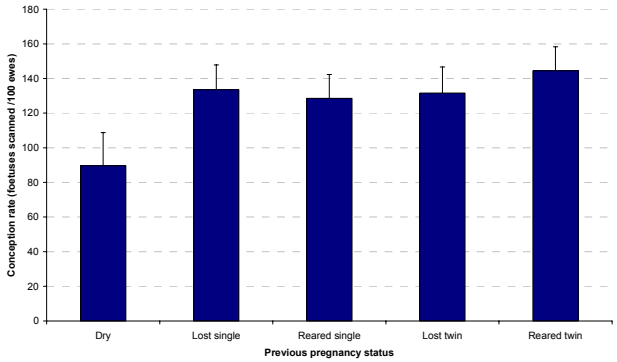

Figure 3: Dry ewes are less likely to conceive at their next joining.

There was no significant impact on the ability to rear a lamb on conception at a subsequent joining. Whether or not a ewe successfully reared her lamb in one year did not affect her ability to conceive at her next joining.

Remember, these results deal with conception. The impact of maternal nutrition (ie fat score) during late pregnancy and lactation will also have an impact on birth and weaning weights and hence survival of the progeny - this is particularly important for ewes carrying twins. It is therefore important to monitor ewes at critical stages during their reproductive cycle to minimise the difference between lambs scanned and marking and weaning percentages.

Important points

- Ewes below fat score 2.5 have an increased risk of being dry, ewes above fat score 3 can be maintained at their present body condition. The specific action for ewes between 2.5 to 3 depends on the conception response of your flocks and the prevailing seasonal conditions.
- Average flock conception rates can be improved by drafting dry ewes from the breeding mob after pregnancy scanning.

Monitoring ewes at critical stages during the breeding cycle is essential to minimise the difference occurring between the number of lambs scanned and marking and weaning percentages.

- The aim must be to achieve the target fat score of 3 at joining off pasture. Initial economic analyses using the NSW paddock-scale site data (see below) indicates that supplementary feeding for increased conception is marginal at current market prices.

Feeding for improved conception - does it pay?

Phil Graham, NSW DPI Livestock Officer (Sheep & Wool) Yass

The information in Table 1 attempts to put some dollar returns on the analysis of the NSW conception data in the preceding article. This economic analysis work is based on feeding to improve fat score by 0.5 units. The assumptions used were:

- All extra lambs are sold – 2 figures were used, $25 or $40 per lamb. Note that this is profit from the extra lamb – not the actual sale price. These prices cover the range from wool to meat operations with wool properties at the lower end.
- Wool prices used are December 2005 for a base 19 µm flock.
- Only ewe progeny are shorn and they are shorn 4 times. The improvement in wool performance of the progeny from improved fat score of the ewes is 0.2 kg/hd/year and -0.2 µm.
- $2.66/ewe is allowed for supplementary feeding, which is enough to improve fat score by 0.5 in Southern NSW averaged over many years.
- The wool returns over the 4 years have been discounted @ 5%.

The figures in the body of the table are the profit/ewe from improving fat score by 0.5 units (from 2.5 to 3.0). A range of improvements in weaning percentages are given to reflect the responses seen across Australia.

Table 1. Profit per ewe from an improvement in fat score at joining due to increased conception.

Improvement in Weaning Percentage	$25 / Lamb + Current Wool Prices	$40 / Lamb + Current Wool Prices
4.6% (NSW Data)	$0	$0.69
10.0% National average	$1.36	$2.86
15.0% Upper range	$2.61	$4.86

If your wool is 21 µm it would reduce these returns by 40c/head. Shearing the wether progeny once, adds 45c/head to the listed figures. So, based on the NSW conception response, the return from feeding to improve fat score at joining with current prices is "line-ball" at best. The best bet is to achieve the target fat score of 3 at joining from pasture

Progeny wool production & quality - NSW sites

Dr Sue Hatcher, NSW DPI Senior Research Scientist

The progeny at each of the three NSW paddock-scale sites had their first shearing during 2005. Progeny at Carwoola were shorn in mid-March at approx 6 months of age and Kialami and Oak Hills in August at 10 and 11 months of age respectively.

Wool production

At Carwoola there was no significant difference in clean wool production between the high nutrition and low nutrition groups (Fig. 4). All progeny cut about 1.2 kg CFW.

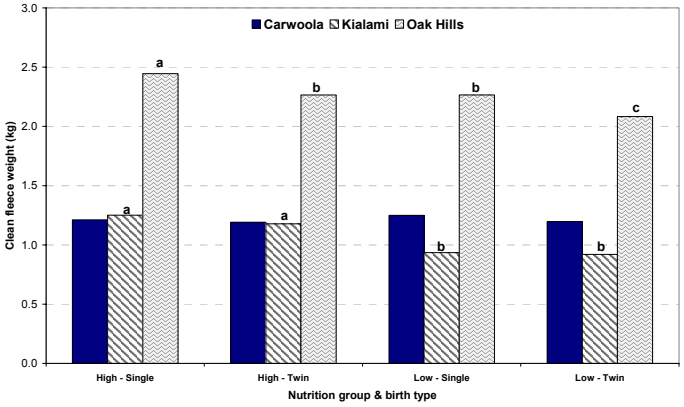

Figure 4. Progeny born in the high nutrition groups tended to have higher CFW than the low nutrition progeny..

Progeny born to high nutrition ewes at Kialami had higher clean fleece weights (+0.3 kg) than the low nutrition progeny (Fig. 4). The higher CFW was due to higher greasy wool production (+ 0.4 kg) as well as higher yields (+1-2 %) of the high nutrition progeny. Oak Hills progeny also cut heavier fleeces (Fig 4), both greasy and clean (+0.2 kg), than progeny born to low nutrition ewes. The difference in yield between the high and low progeny at Oak Hills was the same as that at Kialami (ie +1.2%).

At each of the three sites, twin born progeny had lower clean and greasy fleece weights than single born progeny as well as lower yields. Interestingly the difference in wool production between single and twin born progeny was greater among the high nutrition progeny. In the high nutrition group, singles cut approx 0.3 kg more clean fleece than twin progeny while in the low nutrition group this difference was only 0.2 kg.

Wool quality

At both Carwoola and Oak Hills there was no significant difference between the two nutrition groups in average fibre diameter (Fig. 5). However significant differences were evident between the high and low nutrition progeny at Kialami where the high nutrition progeny cut slightly broader fleeces than the low nutrition progeny (15.4 versus 15.0 µm).

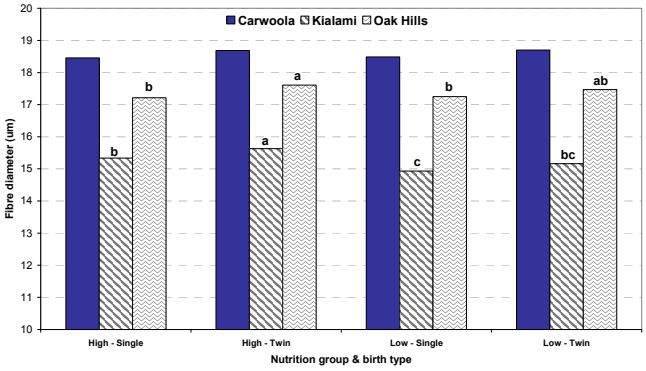

Figure 5. Differences between the high and low nutrition progeny in average fibre diameter were variable.

Across all three NSW sites, the fleeces of the single born progeny were about 0.2 µm finer than those of twin born progeny. The single born progeny also tended to have higher standard deviation and coefficient of variation of fibre diameter than twin born progeny.

So how do these results compare with sites in other states?

Variation in wool production between the high and low nutrition groups at the three NSW sites is comparable to that achieved at the small plot research sites in Victoria and WA (Fig. 6) for progeny CFW and AFD.

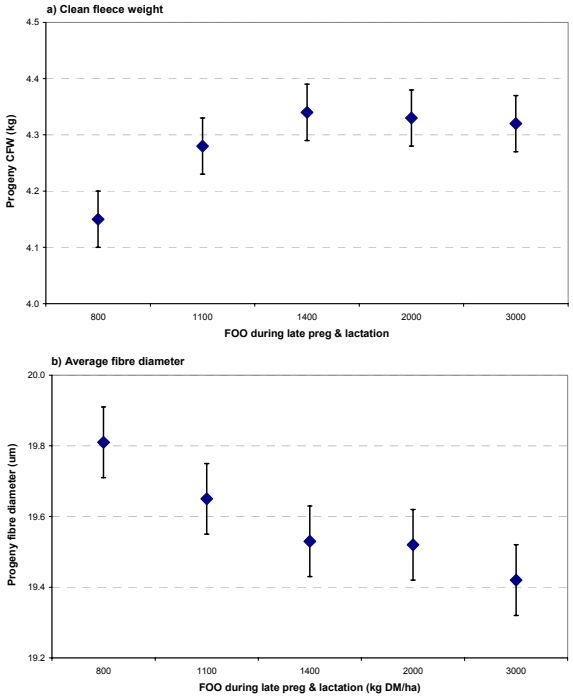

Figure 6. Progeny from better fed ewes during pregnancy grow a) heavier and b) finer fleeces. (Source: Dr Andrew Thompson, National Project Leader of Lifetime Wool, DPI VIC)

At the two small plot sites, improving the nutrition of the Merino ewe during pregnancy and lactation increased the clean fleece weight and reduced the diameter of the progeny's wool during their lifetime. The difference in the magnitude of the differences between the three NSW sites and the small-plot work is due to a combination of factors; i) the fat score difference achieved between the high and low groups during pregnancy and bloodline and environmental differences between sites. These factors will each affect the responsiveness of progeny CFW and FD to improved ewe nutrition during pregnancy.

These results are from the first shearing of the progeny from the three NSW sites. Further data will be collected at future shearings in both 2006 and 2007. Results from these subsequent shearings will be made available in future issues of this newsletter.

Preparation for joining - things to do now

1. Fat score ewes.

- Are your ewes at the target of score 3?
- Draft ewes according to their fat score. Hold those above score 3 and manage thinner ewes to increase fat score.
- Join maiden ewes separately from older ewes, with a higher percentage of older experienced rams
- Be targeted with any supplementary feeding.

2. Ram preparation

- If feeding rams, start 9 weeks before joining. The semen cycle is 6 to 7 weeks.
- Avoid shearing rams just before joining; this is more critical in hot weather.

3. Mating paddock preparation

- Smaller paddocks increase contact between rams and ewes. There should be no problems moving mobs during joining if necessary.

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