

Magnificent Maidens

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Maiden ewes represent a large part of your ewe flock, at an average of $\approx 30\%$ of breeding ewes. They are your best genetics, however getting good reproductive outcomes from maiden ewes remains a challenge for many producers. The difference between the reproductive rate of maidens and their older counterparts is usually around 20%. This can be considerably higher in some cases.

The traditional maiden ewe is one that goes to the ram for the first time at 19 months of age. However, in a maternal composite, first-cross ewe or shedding ewe-based system it is more likely to be a ewe joined at 7-9 months of age. The principles are the same for whichever of these two classes you are working with.

The aim of management of maiden ewes is to close the gap between their performance and that of the older ewes. Research into the reproductive performance of ewes has largely focussed on adult ewes. There has been an increased focus on ewe lambs more recently, however limited work has investigated the reproductive performance of traditional maidens joined at 19 months of age. The limited studies that have been conducted involving traditional maidens have demonstrated that their poorer reproductive performance can be attributed to poorer conception and reproductive rates and, at least in some cases, poorer survival of their lambs compared to those born to adult ewes.

The Magnificent Maidens Producer Demonstration Site (PDS)

With the valued support of Meat & Livestock Australia, the Magnificent Maidens PDS project aimed to help understand and demonstrate the key factors required to achieve successful reproductive outcomes from maiden Merino ewes joined at 19 months of age. The project included five demonstration sites across southern Australia where producers compared the reproductive performance of Merino ewes at their maiden (19 months) and second joining when maidens were managed according to 'best-bet' management versus 'normal' management for the farm. Ewes in the 'best-bet' group were fed about 30% more energy and protein than the 'normal' group during their maiden joining, with the differential nutrition ceasing at removal of the rams. Data collected included weights and condition scores at joining and pregnancy scanning results at the maiden joining at 19 months of age and their second joining at about 2.5 years-of-age.

The PDS findings in a nutshell

On average, ewes in the best-bet group gained more weight before joining, were 1.8 kg heavier and 0.1 condition score higher at joining and gained more weight during joining compared to those in the normal group. Ewes in the best-bet group had higher conception rates (93.5% vs 89.1%) and scanning percentages

(124.6% vs 113.8%) as a maiden than those in the normal group. Ewes that were heavier at joining and in better condition score (CS) and that grew faster during joining were more likely to achieve better conception rates (Figure 1) and scanning percentages (Figure 2).

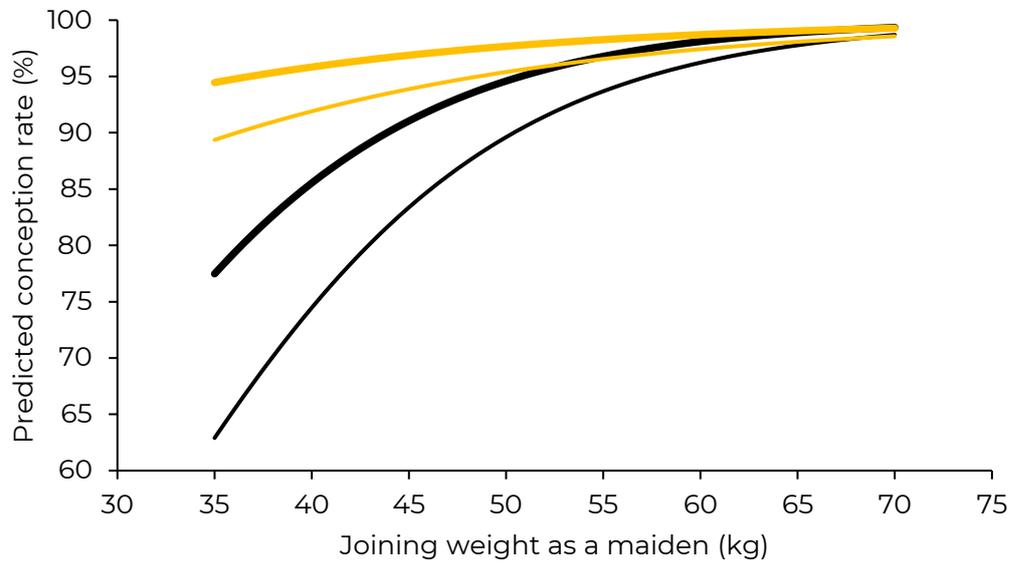


Figure 1. The effect of joining weight on the predicted conception rate of maiden Merino ewes when losing (thin line) or gaining (thick line) 100 g/hd/day during joining and joined at condition score 2 (black) or 3 (yellow) across four producer demonstration sites across Australia

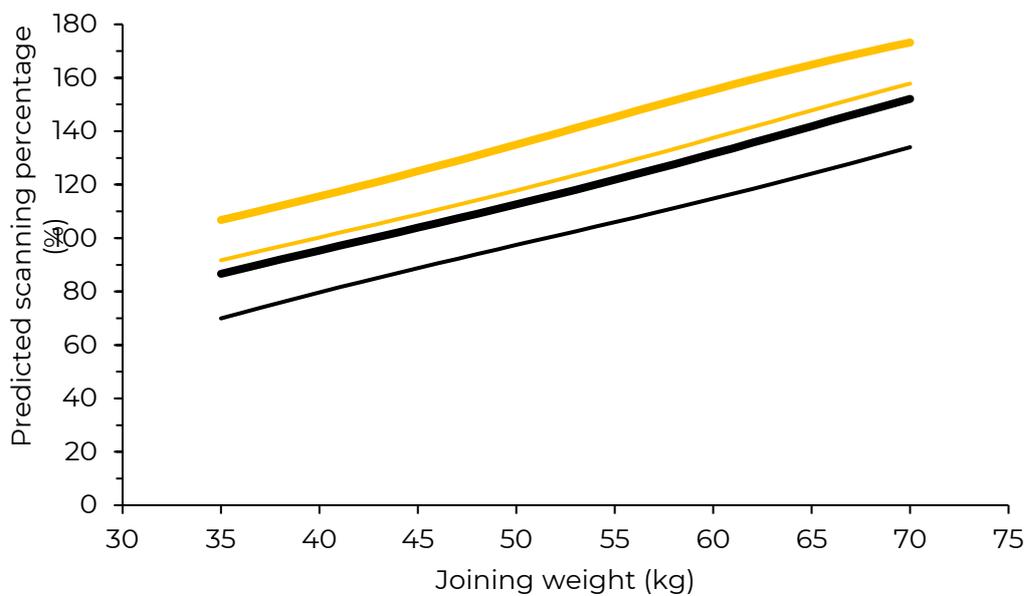


Figure 2. The effect of weight at joining on the predicted scanning percentage of maiden Merino ewes when losing (thin line) or gaining (thick line) 100 g/hd/day during joining and joined at condition score 2 (black lines) or 3 (yellow lines) across four producer demonstration sites across Australia

Ewes that were in better condition score at their second joining were more likely to achieve higher conception rates. Ewes that were heavier at their second joining or that were scanned as twin-bearing as a maiden were more likely to achieve higher scanning percentages, with more ewes being scanned as twin-bearing (Figure 3).

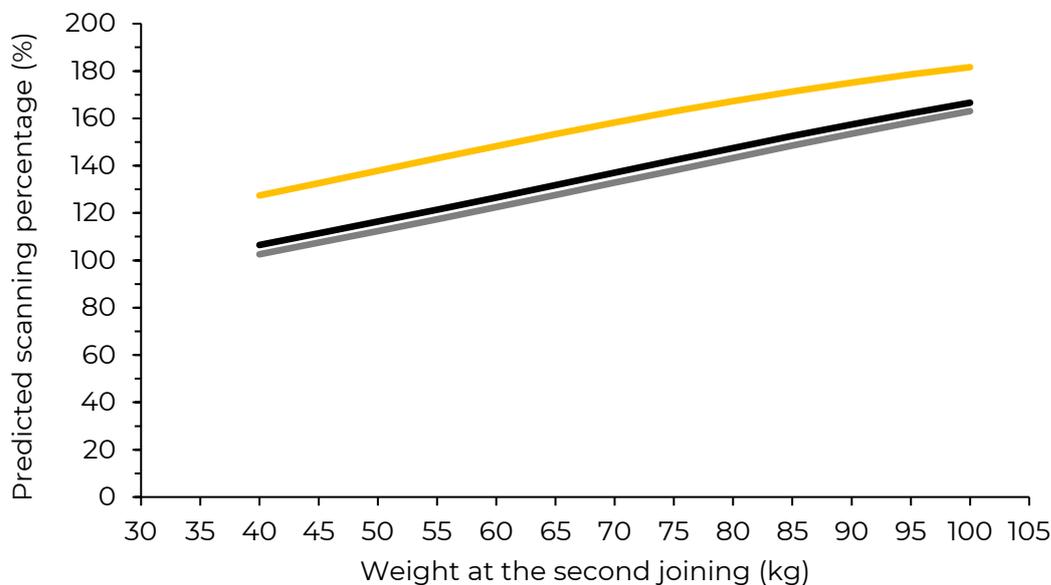


Figure 3. Effect of the weight of Merino ewes at their second joining as a 2.6-year-old on the predicted scanning percentage at their second joining when scanned dry (grey line), single-bearing (black line) or twin-bearing (yellow line) as a maiden and joined at condition score 3 across three producer demonstration sites across Australia

New targets for maiden Merino ewes

Economic modelling has been conducted by Michael Young of Farm Optimisation Group. The modelling was conducted with Australian Farm Optimiser, which is a powerful whole-farm optimisation model that has unmatched level of detail in its livestock production equations, making it capable of capturing the biological and economic trade-offs associated with nutritional management.

The analysis was undertaken for a 'typical' 1000 ha farm in the Hamilton region of south-west Victoria that runs a medium-framed, 21-micron Merino flock with a 60 kg Standard Reference Weight (SRW), lambing in spring and pregnancy scanning ewes for multiples. The results are specific to the modelled farm, however it is expected that similar conclusions can be drawn for other systems. If you're unfamiliar with SRW, this is the weight of a dry, adult sheep at condition score 3 when bare-shorn and fasted.

The modelling has shown that optimal targets for maiden Merino ewes are to join at 96 – 98% of SRW and maintain weight during joining. Profitability is sensitive to these targets, with higher joining weights and maintaining weight during joining

generally leading to greater returns (Figure 4). However, profitability can decline sharply when joining weight exceeds the standard reference weight, due to the inefficiency of weight gain when ewes are in higher condition.

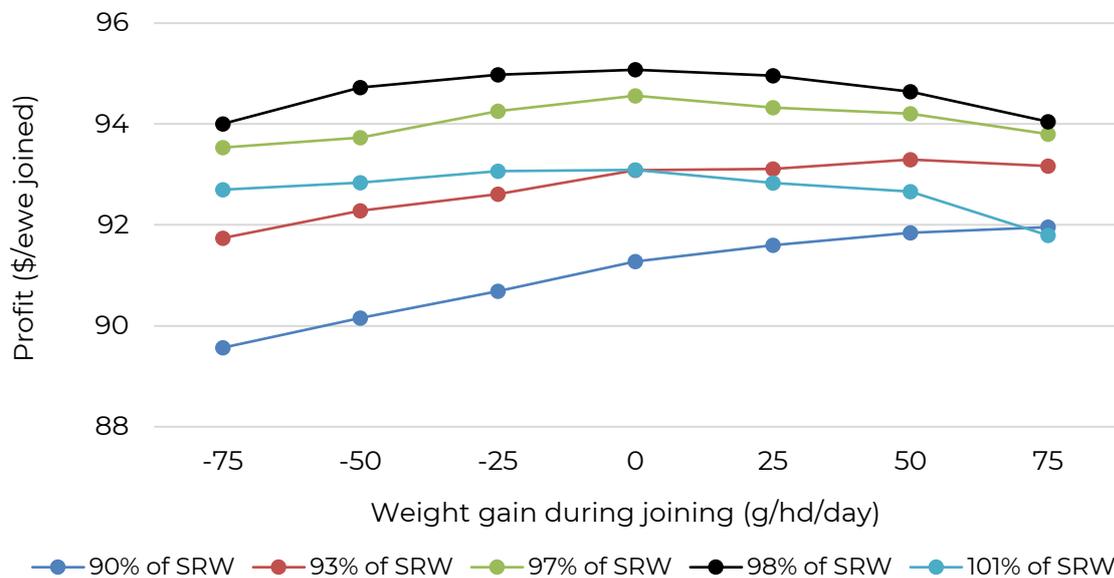


Figure 4. Effect of joining liveweight change (LWC; g/day) on profitability (\$/mated ewe) across a range of maiden ewe joining weights (LWj; expressed as a percentage of standard reference weight).

Changes in supplementary feed costs did not significantly alter the optimal nutrition targets, provided that producers can respond to rising feed costs by adjusting the stocking rate (e.g. through destocking) and/or the amount of supplementary feed fed. A higher cost of supplementary feed reduces absolute profit but profit per ewe joined is higher because of changes to the stocking rate and amount of feed fed in response to the higher feed cost (Figure 5). If producers cannot make these strategic responses, the optimal nutrition targets could change. This was not examined for this analysis, however the drivers of nutrition targets will be examined further in the Precision Sheep Management project (Project L.LSM.0038), that has recently begun, with funding from Meat & Livestock Australia, Australian Wool Innovation and collaborating partners.

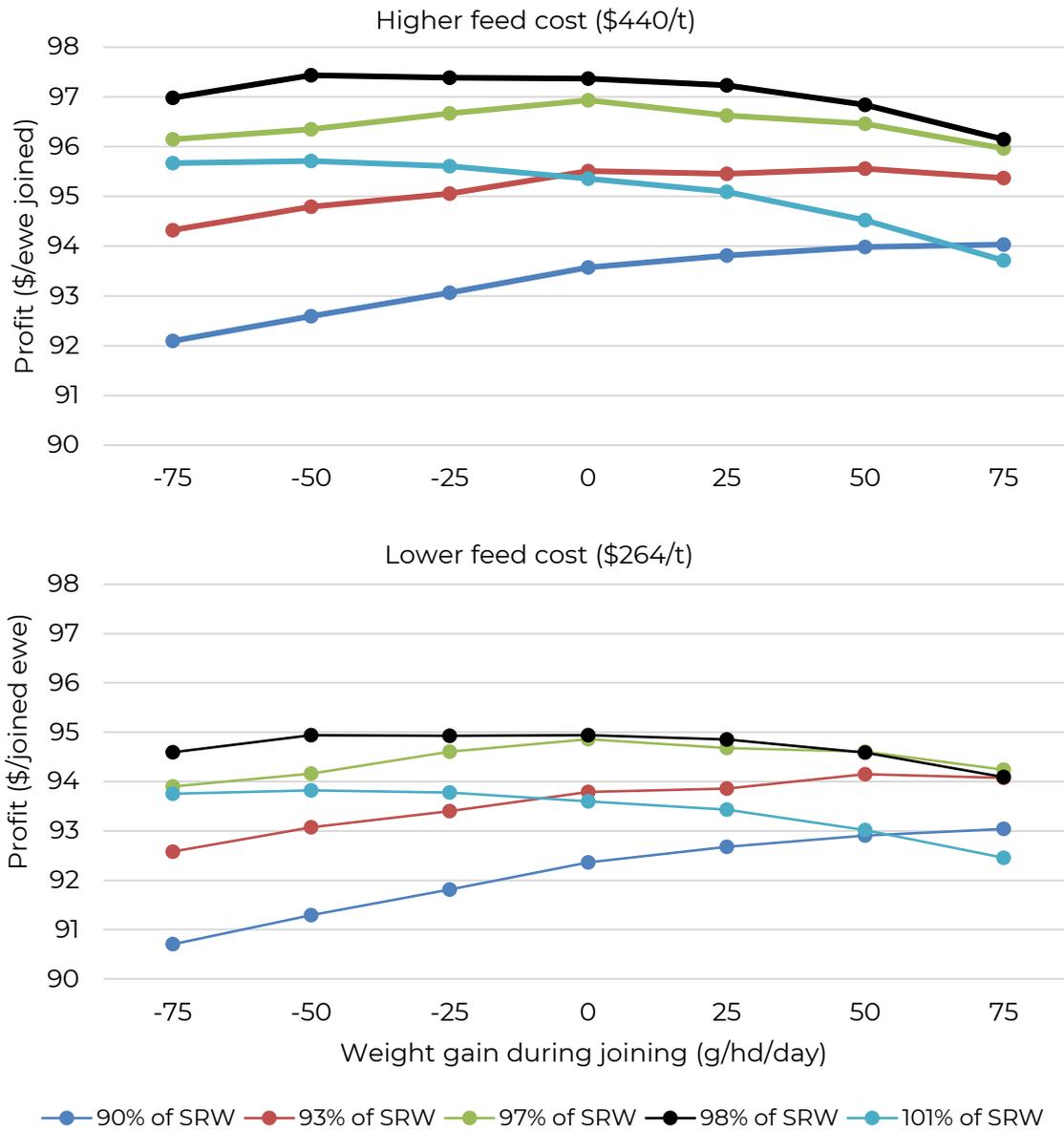


Figure 5. Effect of weight gain during joining on profitability across a range of maiden ewe joining weights (expressed as a percentage of standard reference weight; SRW) when supplementary feed costs are lower (lupins at \$264/tonne) or higher (lupins at \$440/tonne).

The economic impact of implementing the revised targets for maiden ewes will depend on each farm's current nutritional management. However, under a scenario where producers are currently using established best-practice guidelines, such as those from *Lifetime Ewe Management*, the new targets are projected to increase whole-farm profit by 0.5%, income per ewe by \$4.90 and weaning rates by 10%. The improved reproductive performance allows for a 2.1% reduction in the number of ewes joined and 0.5% reduction in stocking rate.

Where to next?

The new targets identified by this project move us a step (or few!) nearer to closing the gap between the reproductive performance of maiden and adult ewes. Further analysis would be valuable to assess the economic importance of achieving these targets. As always, research often answers some questions whilst raising some new ones. More comprehensive guidelines for managing maiden Merino ewes could be developed with further work involving larger numbers of maiden Merino ewes and a broader range of Merino genotypes, to understand whether the response to better nutrition or the optimal management targets vary between genotypes. It would also be great to better understand the reasons behind the carryover benefit of being scanned with twins as a maiden and whether the performance of progeny born to twin-bearing maiden Merino ewes is poorer than that of progeny from ewes scanned with singles. This also influences culling decisions for ewes that are scanned dry as a maiden and the nutrition strategy for the remaining flock, which could be explored with further economic modelling.

Making maidens a priority

Maiden Merino ewes have often been considered second-class citizens. The findings from this project have highlighted the value in shifting this mindset and prioritising their nutrition in early life. Maiden Merino ewes need to be regularly weighed well before joining to allow the allocation of pastures, stubbles or fodder crops and/or supplementary feeding to be adjusted to achieve the targets at joining and therefore optimise their reproductive performance and profitability.

Project resources

If you haven't already, make sure to check out the 'Magnificent Maidens' space on [The Hub](#). Here you can access recordings from our webinars, online course, blog articles and much more. You can also interact with the Magnificent Maidens community to ask questions and share knowledge and experiences around managing maiden ewes.

Thanks for coming along for the ride

We'd like to take the opportunity to thank our PDS hosts for their contributions to this project. Thanks also to everyone who has engaged in the extension activities throughout the project. The Magnificent Maidens community has been a great space to share experiences and knowledge and ask questions.

We'd really appreciate you taking 10 minutes to complete our post-project survey. This will help us and Meat & Livestock Australia determine what we've done well, what we can do better and if investment into this project has helped build your

knowledge and skills around improving the reproductive performance of maiden ewes.

You can access the survey at [this link](#) or by following the QR code below.

