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Merino Ewe Hogget Best Practice Project

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Executive summary

Merinos are a hardy breed able to survive harsh winter and summer conditions, but like all animals, the better they are fed, the better they will perform. Based on this assumption, the Merino Ewe Hogget Best Practice Project aimed to identify practices that produced the fastest growing hoggets and the best wool.

This paper focuses on:

- Why good nutrition is important from pregnancy onwards
- How ewe hoggets performed under different grazing strategies
- How management is reflected in the fibre profile

This is a research summary. The original report can be obtained from Allison Brook at Merino Inc. or downloaded from the Merino Inc. web site: www.merinoinc.co.nz

Key findings

- Ewe management in late pregnancy should be given more consideration by some merino farmers. Milk production, lamb survival and lamb growth rate, as well as the life time fibre diameter and fleece weight of her progeny are all determined by how well fed the ewe is before she lambs.
- Growth in the first year of life is critical. No matter how good her genes, a ewe whose growth is restricted as a lamb or hogget, will never fully express her potential.
- Management practices that promote fleece weight and staple strength also improve lamb survival and weaning percentages. Improved weaning percentages provide a larger pool for selecting replacements.
- Lamb and hogget growth rates appeared to be more closely linked to feed quality than DM/ha.
- Hoggets performed best on clean (low parasite challenge) pasture. The best results came from grazing vineyards; paddocks which were previously used for silage or hay; or those which had been "cleaned" by cattle.
- Hoggets invariably did poorly when grazed on high endophyte pastures in the autumn and cold southerly facing blocks in the winter.
- Management decisions are reflected in the wool fibre profile. Fibre profile analysis is a useful, though retrospective tool for understanding the effects of various management practices.

The Marlborough Merino Ewe Hogget: Best Practice Project

This project ran from 2000 to 2005 and involved 10 high country properties from the Awatere and Wairau Valleys. During the project some of the original properties pulled out, while others joined up. The farmers involved recorded the management of their ewe hoggets from weaning until the two-tooth stage, and the pastures they grazed. The project aimed to:

- identify practices that produced the fastest growing hoggets and the best wool
- encourage farmers to adopt best practice management guidelines

Towards the end of the investigation it became clear that hogget performance was very dependent on pre-weaning development. As a result, ewe condition and pre-weaning lamb growth rate were also measured on a few properties in the last year of the project. The results are from a limited number of on farm observations. The aim of the project was to look for trends, not to statistically analyse.

Impact of good nutrition on hogget performance and ewe production

Good nutrition *in utero* through to mating as a 2-tooth will pay dividends in life-time performance including:

- growth rate and final body weight as an adult
- life-time lambing performance (and performance of those lambs)
- wool follicle development – finer, heavier fleeces

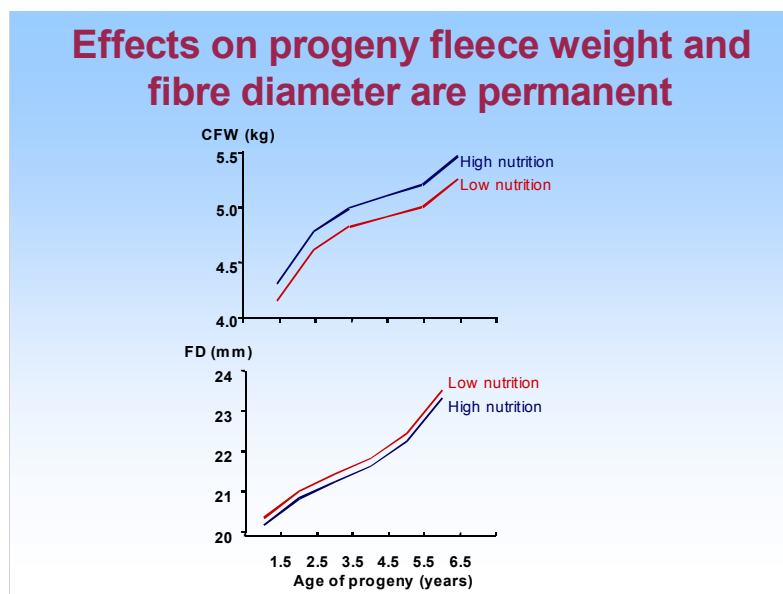
Ewe feeding during pregnancy

Sixty percent of lamb growth is determined by the ewe's pre-lambing condition. Pre-lambing nutrition also influences mammary gland development and thus milk supply, as well as lamb survival. Increasing feed after lambing will not alter these important factors. Saving paddocks to provide good feed only at or after lambing is not a good strategy, the nutrition is coming too late.

In this study twin bearing ewes that maintained good condition through to weaning raised two well grown lambs. Conversely, not giving them preferential treatment and forcing them to compete with singles ensured lighter twin lambs.

Graph 1: Effects on progeny fleece weight and fibre diameter

The Lifetime Wool Project (A Thompson *et al.* DPI, Hamilton Victoria, unpublished) found that late pregnancy ewe nutrition permanently affects progeny fleece weights and fibre diameter. Lambs born to better-fed ewes lay down more secondary follicles which produce finer, shorter fibres than primary follicles. The more secondary follicles/fibres, the finer the mean fibre diameter of a fleece.



Marlborough Project Findings

Lamb weaning weights relative to ewe condition score (CS) at weaning

Ewes in better condition at weaning wean heavier lambs.

- An increase in ewe condition score of 1 at weaning on average meant ewes weaned lambs 5kg heavier.

If feed quality/quantity is declining after tailing, consider early weaning. However, successful weaning at light weights will only be achieved if lambs are weaned onto high quality feed.

Hogget growth rates relative to weaning weights

Post weaning growth rate appears to be determined to a large extent by weaning weight. A year after weaning, the average weight of mobs of hoggets which had been weaned at 23+kg was 48.6kg compared with 42.4kg for those that were weaned at weights below 23kg. Put simply, lambs weaned under 23kg will never catch up.

Fleece weight, fibre length and fibre diameter relative to body weight

Heavier hoggets shear significantly more wool. An extra 5kg body weight at shearing produces on average another 700g wool. Wool from heavier hoggets tended to be of increased micron.

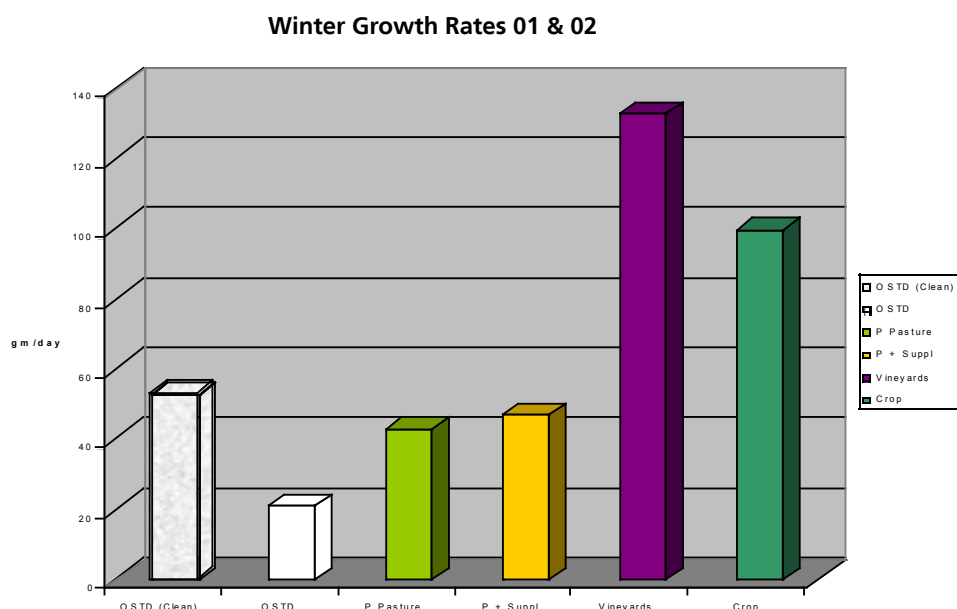
Best grazing management practice for growing good ewe hoggets

Having established the link between good nutrition in lambs and hoggets and lifetime ewe performance, the next question is... "what is good nutrition?" The farms in the project ran their lambs and hoggets on a range of land and pasture types, weighing them before and after each move. This information highlighted quite clearly which management practices promoted growth and which did not.

Effect of different feed types during different seasons on hogget growth

Results showed the benefit of sowing specialist forage crops for hoggets in the autumn and of grazing vineyards in the winter. Spreading the hoggets out 'on the hill' if feed is short in the autumn and winter can provide as good growth rates as confining them and feeding supplements.

Graph 2: Average hogget growth rate on different feed types during the winter.

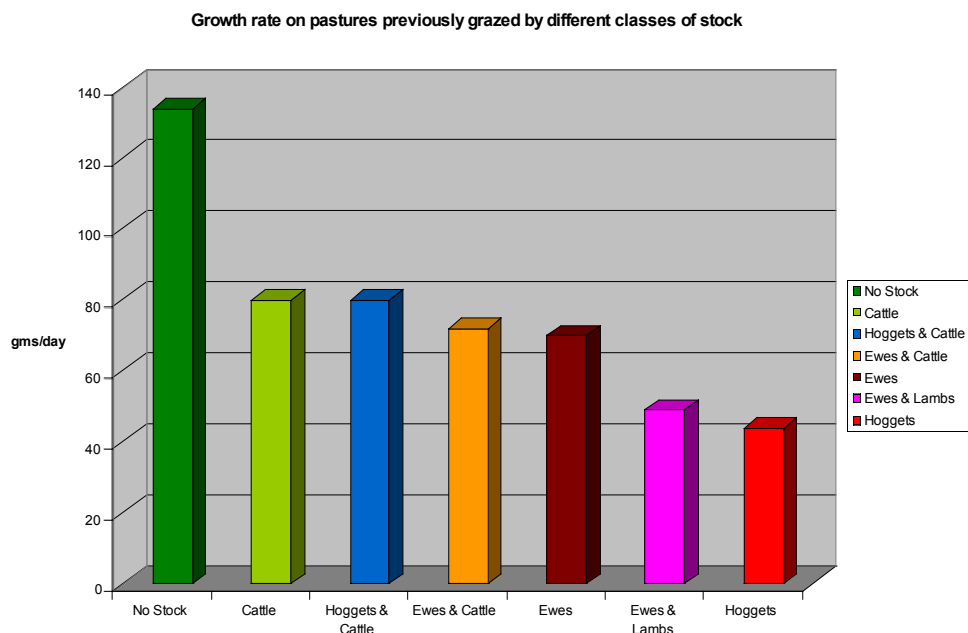


Winter growth rates on permanent pasture are significantly influenced by the increasingly popular practice of grazing hoggets in vineyards. Growth rates on clean over sown and top dressed (OSTD) pastures were similar to those on permanent pastures and those fed with supplements.

Graph 3 clearly shows that hoggets perform best on clean pasture. The best results came from grazing vineyards or paddocks which were previously used for silage or hay. Pastures cleaned by cattle also showed better growth rates.

The worst growth rates occurred when hoggets grazed paddocks previously grazed by themselves or by ewes and lambs. This suggests that parasitism was a major contributing factor.

Graph 3: Hogget growth on pastures previously grazed by different classes of stock



Hogget growth and pasture quality

Pasture was graded: 1- dry and dead; 2 – some green leaf, lots of dead and seed heads, few legumes; 3 – some leaf, some legume, medium dead and seed heads; 4 – leafy with reasonable legume; 5 – high legume/ herb, young leaf eg forage crops.

Not surprisingly, the better the pasture, the higher the weight gains. Growth rate on high quality pasture was more than twice that on low quality pasture.

The quality of pasture when stock were removed also affected growth. The growth rate of hoggets removed while residual pasture quality remained high was double that of hoggets who stayed grazing pasture until pasture quality was poor.

Higher hogget growth rates also tended to be associated with higher pasture DM. Most farmers put hoggets on pasture that had 2000kgDM/ha or less. Growth rates on pastures 1500kgDM/ha or less were poor.

No obvious relationship was found between the amount of residual left on the pasture and hogget growth rates. However farmers did not achieve growth rates over 100g/day if the pasture was less than 800kgDM/ha when the hoggets were removed.

Overall, lamb and hogget growth rates appeared to be more closely linked to feed quality than DM/ha.

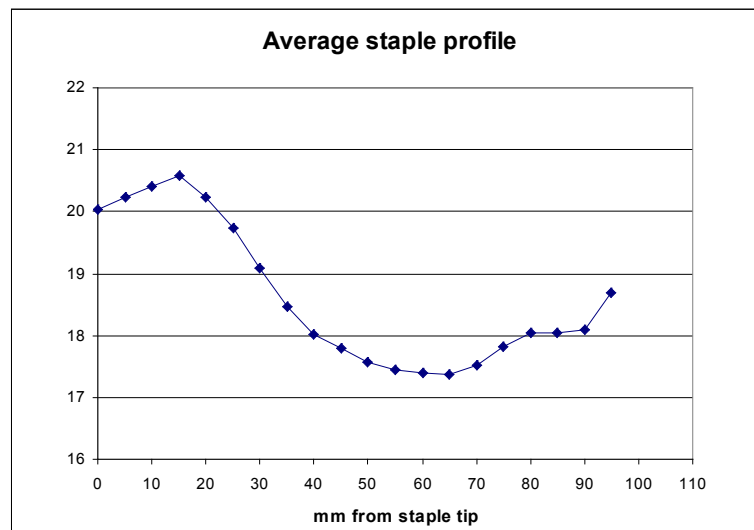
Using fibre profiles to monitor ewe hogget performance

Fibres with finer ends relative to the mean diameter are more comfortable when worn next to the skin. There is also less chance of them having a weak point mid fibre which will result in a lower staple strength and lower returns. Optical Fibre Diameter Analysis (OFDA) tests of the Marlborough properties revealed a large variation in fibre profile between years on the same property and between properties in the same year. However generally the profile was one showing an undesirable reduction in diameter somewhere along the mid part of the fibre.

The aim of the project was to link management practices with changes in fibre diameter. While some of the practices which cause problems are difficult to avoid, understanding the cause and effect process can help farmers identify management changes that will at least reduce the severity of some of the set backs seen.

Fibre profile could also be a useful indicator of ewe management and nutrition in late pregnancy.

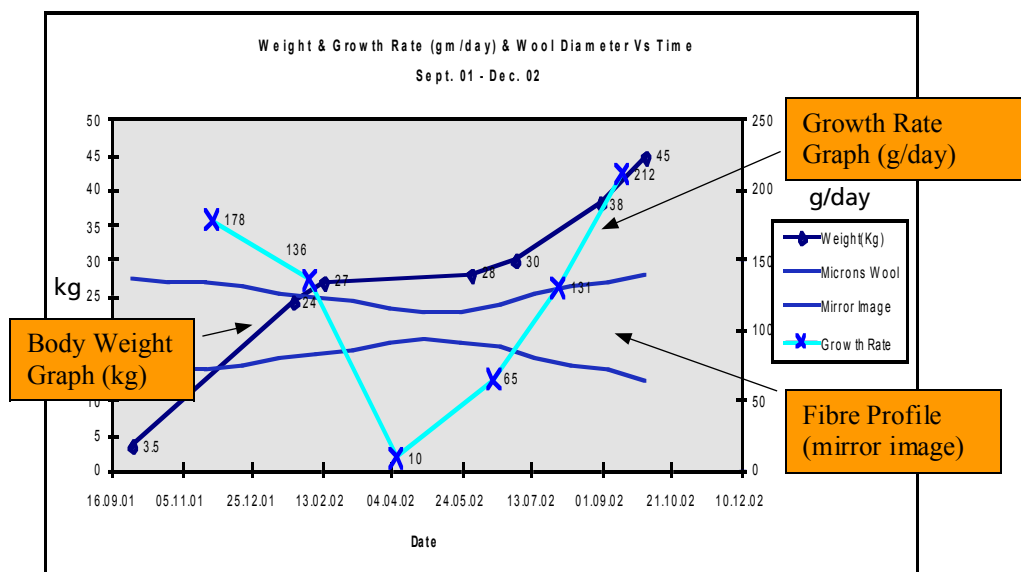
Graph 4: Fibre profile for one property.



Graph 4: explanatory notes

- A typical fibre profile showing a reduction in diameter along the mid part of the fibre.
- Mean fibre diameter = 18.66 micron
- Mean Staple Length = 78.2 mm. Fibre profile beyond this point is significantly influenced by a few fibres from a few longer fleeces and is therefore not included.

Graph 5: Linking hogget weight, growth and wool diameter

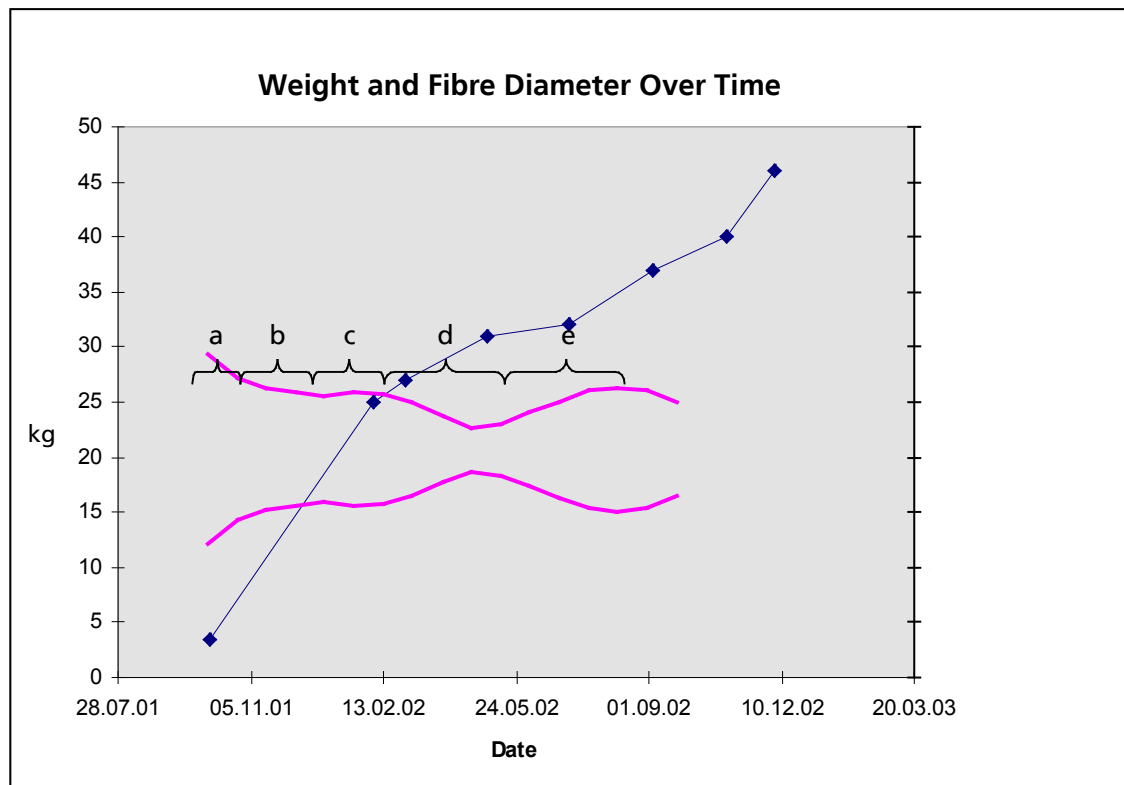


Graph 5: explanatory notes

A mirror image fibre profile has been added to the graph. It illustrates shifts in fibre diameter from 18.2 micron in September 01, down to 17 micron in April/May 02, then back up to 18.6 micron in October 02.

- Between February and May 02 the hoggets only put on 1 kg (10gm/day) body weight. This period of reduced growth rate was associated with a narrowing of fibre diameter and 'weak point' mid fibre. This is not a desired profile (coarser tips) but was a common finding during the project.
- More frequent weighings are likely to have given a better match between growth rate and fibre profiles.
- Any loss in fibre diameter and reduction in body growth rate has to be considered a lost opportunity in terms of fibre quality and fleece weight, as well as body weight.
- Fibre profile is probably a very good template to illustrate previous management.

Graph 6: Major events associated with fibre profile changes.



Graph 6: explanatory notes

A mirror image fibre profile has been added to the graph to indicate increases and decreases in micron over the year.

- Reducing fibre diameter from the tip suggests declining nutrition for the ewes in late pregnancy.
- It was a very wet cold spring and lambs did not do well during this period
- Lambs were weaned onto silage paddock aftermath with good covers and high legume content.
- During this period the lambs were grazed on deteriorating dry summer pasture, sometimes as low as 800Kg DM/ha and with a high endophyte content. Ryegrass staggers was seen. This coincides with a weak point mid fibre.
- Hoggets were wintered on both pastures 'cleaned' for at least 3 months by cattle and in vineyards.

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Fibre profile and management

The hogget fibre profile is clearly affected by many management decisions. These include ewe management during pregnancy as well as management of the lamb/hogget itself.

Good nutrition of ewes in late pregnancy will ensure they have progeny that produce finer and heavier fleeces over their lifetime and a hogget fleece that is less likely to be coarser at the tip. It will also ensure better lamb survival and pre-weaning growth rates of lambs.

Practices that encourage satisfactory hogget growth rates will also produce hogget clips with an even fibre profile and good staple strength. Key factors include the use of low parasite challenge pastures and high quality high legume content pastures, and the avoidance, where possible, of cold southerly faces in the winter and high endophyte pastures in the autumn.

Shearing dates could also possibly be used to alter fibre profile. For example, lamb shearing at weaning would remove stronger tips. However excellent post shearing nutrition would be required to ensure the profile increased from the tip.

Hogget shearing occurs in the spring when growth rates are high and the diameter at the base of the fibre is invariably at its maximum. As feed quality declines into the summer, diameter may reduce. Therefore delaying hogget shearing a month or two and having a weaning shearing could improve the profile.

Best management conclusions and recommendations

Generally, management practices that encourage a consistent and satisfactory growth rate from birth through to mating as a 2-tooth, will not only determine fibre profile and financial return from hogget wool, but also lifetime performance - lambs and wool.

Management practices that promote fleece weight and staple strength, especially improved ewe nutrition in late pregnancy, will also improve lamb survival and weaning percentages. Improved weaning percentages allow a greater selection pressure for replacements.

Fleece weight and staple strength have just as much impact on wool returns as fibre diameter. For this reason it is important to identify and implement management practices which will produce a heavier clip with good staple strength.

No matter how good her genes, ewes that have had their growth affected as young stock will never be able to fully express their potential. Growth in their first year of life is critical, in fact it starts before they are born.

- Hogget growth rate and performance starts with ewe management.
- Plan for excellent ewe nutrition in late pregnancy. Ewe management at this time needs to be reviewed on some properties.
- Preferentially manage twin bearing ewes.
- Aim for a minimum weaning weight of 23kg.
- Consider early weaning if ewe condition score is declining.
- Plan for hoggets to graze 'clean' pastures.
- Pasture quality appears to be of more importance than quantity.
- Don't put hoggets onto cold south facing blocks in the winter.
- Consider grazing off property or utilise more specialist weaning and winter pastures or crops.
- Avoid high endophyte pastures.
- Wool fibre profile analysis is an effective, although retrospective measurement of stock performance.