Shearing Merino ewes at different stages of pregnancy: some consequences for the progeny

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Erica van Reenen

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Abstract

Merinos are bred primarily for wool production, valued specifically for the fine-wool they produce. Wool returns have been diminishing over recent years so using management to improve wool quantity and quality is beneficial to growers. Shearing ewes at different stages of pregnancy has been shown to potentially influence the follicle population which in turn could achieve a finer, heavier fleece in the offspring, although this has not been examined in Merinos. A consequence of the diminishing wool returns is a greater emphasis on meat production, resulting in a shift in focus to increase live weight and body condition in order to increase reproductive performance and produce heavy lambs for sale. The whole Merino wool market is also currently threatened by the perception of overseas purchasers towards the practice of mulesing. Mulesing is undertaken in approximately half of New Zealand’s Merino lambs as a means of reducing blowfly strike.

There are few data available under New Zealand conditions for these pre-mentioned management factors that influence Merino production. Therefore, the aim of this thesis was to profile the live weight and body condition of single- and twin-bearing Merino ewes; investigate the effect of shearing time of Merino ewes on the live weight, fleece characteristics and the follicle population in their progeny; and to investigate the effect of mulesing Merino lambs on their live weight, dag score and fleece characteristics.

Two hundred and ninety nine Merino ewes were bred to 4 mature Merino rams on day 0 of the experiment (d0; May 20, 2006). Pregnant ewes were then allocated to one of three shearing times; mid-pregnancy (d106), late-pregnancy (d141) and post-lambing (d191). Ewes were weighed and condition scored on d0, d79, d106, d141, d191 and d283 of the experiment.

The ewes produced 128 ewe-lambs which were used for subsequent measurements. Ewe-lambs were identified using DNA parentage testing to their dam’s maternal shearing treatment. Ewe-lambs were weighed on d191 (approximately 6 weeks of age) and weighed and dag scored on d191 (approximately 6 weeks of age), d283 (approximately 4 months of age), d359 (approximately 7 months of age) and d499 (approximately 1 year of age). Ewe-lambs were wrinkle scored on d191. On d191, 60 ewe-lambs were mulesed; the remaining 67 were left un-mulesed. A skin biopsy was taken from the mid-side of the lamb at d359 and analysed for primary and secondary follicle density. Two mid-side wool samples were taken from the lambs; one at d359
(approximately 7 months of age) and one at d499 (approximately 1 year of age). The first of these samples was analysed for washing yield, colour and fibre diameter. The second mid-side was analysed for fleece class, staple length and staple strength respectively. At d499 fleece weight was measured before the mid-side sample was taken.

Twin-bearing ewes were heavier (P<0.05) than single-bearing ewes from d0 (start of breeding) through to d79 (pregnancy diagnosis). They were also heavier (P<0.05) following this period. However, this is most likely due to the weight of their foetuses. Body condition score of twin-bearing ewes decreased following lambing until d191 (tailing) but recovered by d283 (weaning). Single-bearing ewes were more likely (P<0.05) to be rearing a lamb at d191. Single-born lambs were heavier (P<0.05) at d191 and d283, had heavier fleeces and had a higher primary follicle number index than their twin-born counterparts.

Shearing time of Merino ewes had no effect on lamb live weight at any stage of the experiment. It also had no effect on ewe live weight apart from in late-pregnancy where the mid-pregnancy shorn ewes were heavier (P<0.05) than late-pregnancy shorn and post-lambing shorn ewes. Shearing ewes in mid-pregnancy had no effect on the fleece characteristics of their lambs. The progeny of lambs born to ewes shorn post-lambing had a significantly greater follicle density, secondary follicle density, follicle number index and secondary follicle number index than their mid- and late-pregnancy shorn counterparts.

Mulesing Merino lambs had no effect on their growth, live weight or fleece characteristics. It resulted in a reduction in dags at d359 and d588 which is likely to reduce susceptibility to blowfly strike. The purpose of mulesing is to reduce wrinkles around the breech, and in this study, the more wrinkles a lamb had at d191 the greater the secondary to primary follicle ratio, total follicle density, secondary follicle density, secondary follicle number index, primary follicle number index, total follicle number index, and fleece weight. This suggests a productive advantage to sheep with more wrinkles; however, they also had more dags and therefore were at greater risk of blowfly strike than the less wrinkly lambs.

In conclusion, shearing ewes post lambing increased the secondary follicle density of the ewe progeny but had no affect on fleece characteristics. In contrast to experiments with other breeds, shearing Merino ewes in mid-pregnancy compared with post-lambing had no effect on fleece or follicle characteristics. There is an opportunity for
future work investigating the mechanisms behind the response of lambs to shearing their ewe post-lambing. The results suggest that maintaining high ewe live weight and body condition score throughout pregnancy will result in more lambs reared to at least tailing, and heavier lambs at weaning. Further work is required to examine the potential benefits of differential management of single and twin-bearing/rearing ewes. Mulesing lambs reduces dag score, and hence is likely to reduce flystrike rates but had no effect on live weight, or fleece characteristics. Alternatives to the practice of mulesing that give equal protection, compared to mulesing, against blowfly strike need to be found.
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The Reasons

It is not fame or fortune
That makes men muster sheep,
On broken, rugged hillsides
And ranges rough and steep.
It is not love of comfort
Or the working of short hours,
That makes them tread the mountains
‘Mid the pure, fresh alpine flowers.

It's the frosty early mornings
As the dawn breaks clear and bright,
And the mists rise from the valleys
As the day takes o'er from night.
It's the climbing out with gang of mates
To reach your beats on high;
The kea soaring on the wing
In the slowly lightening sky.
It's the feel you get when top is reached
And the whole world's stretched below,
A maze of peaks and ridges
Bright red in the sunrise glow.

It's the stirring sight of stringing sheep
As they move for the days first noise,
But it never pays to take them cheap
For they're full of many ploys.
It's the pride you feel when your heading dog
Hooks a mob a mile away,
Though he's cast on running shingle
And his pads have bled all day.
It's the satisfaction at day's end
When the last sheep's through the gate,
With weary tread you head to camp
For the evening's getting late.
It’s the smell of woodsmoke rising
From the hut tucked in the lee,
Of the towering bluff bound massif,
Clothed with bush and shingle scree.
It’s the swinging billy boiling
As the packy makes a brew,
And the dixie on the fireside
Full of simmering mutton stew,
It’s the old camp oven sitting
In the embers glowing red,
And the smells that issue from it
From the slowly rising bread.

It’s the yarning in the sacking bunks
And the smell of candle wax,
The rolling of the day’s last smoke
The whinnies from the hacks.
The hobble chains are clinking
As they head down to the creek,
And the morepork in the birch trees
Tells the world it’s time to sleep

By Jim Morris

For Gordy
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**Abbreviations**

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<thead>
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<th>Abbreviation</th>
<th>Definition</th>
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<tbody>
<tr>
<td>kg</td>
<td>kilogram</td>
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<tr>
<td>μm</td>
<td>micrometres</td>
</tr>
<tr>
<td>N/kt</td>
<td>Newtons per kilotex</td>
</tr>
<tr>
<td>BCS</td>
<td>body condition score</td>
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<tr>
<td>PD</td>
<td>pregnancy diagnosis</td>
</tr>
<tr>
<td>S:P</td>
<td>secondary to primary follicle ratio</td>
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<tr>
<td>S*</td>
<td>secondary follicle</td>
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<tr>
<td>P*</td>
<td>primary follicle</td>
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<tr>
<td>TFNI</td>
<td>total follicle number index</td>
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<tr>
<td>SFNI</td>
<td>secondary follicle number index</td>
</tr>
<tr>
<td>PFNI</td>
<td>primary follicle number index</td>
</tr>
<tr>
<td>cvMFD</td>
<td>coefficient of variation of mean fibre diameter</td>
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**Statistical terms**

* Significant at $P<0.05$
** Significant at $P<0.01$
*** Significant at $P<0.001$
NS Non-significant $P>0.05$