WOOL PRODUCTION OF SUPERFINE MERINOS TRANSFERRED FROM THE HIGH COUNTRY TO LOW PLAINS IN THE SOUTH ISLAND OF NEW ZEALAND

T. WULIJI, J.T.J. LAND and K.G. DODDS

Invermay Agricultural Centre
AgResearch
Mosgiel, New Zealand

SUMMARY

This paper discusses the result of two consecutive years wool production of Superfine Merino ewes and their controls on the Canterbury Plains, after being shifted from the Tara Hills High Country Research Station. The trial was sited on a private property at "Strathburn" Sandy Knolls near Burnham, Canterbury. The mean live weight, clean fleece weight and fibre diameter of the SF group in 1989 (high country) were 49.7 kg (± 0.5), 2.99 kg (± 0.03) and 18.4 μm (± 0.1) respectively which compared that of 57.1 kg (± 0.5), 3.23 kg (± 0.04) and 18.7 μm (± 0.1) in 1990, and 62.4 kg (± 0.6), 3.26 kg (± 0.04) and 19.2 μm (± 0.1) in 1991. The live weight and fleece weight of ewes increased significantly ($P<0.01$) in consecutive years, however, there was also a small increase in fibre diameter. The fibre diameter of the SF group remained significantly lower than the C group while the C group produced a higher ($P < 0.01$) fleece weight. The trial indicated that the genetically superfine Merinos have a potential to increase live weight and fleece weight while holding wool fineness relatively stable in the lowlands. Fleece and foot rot associated with Merino sheep in wet conditions are also noted.

INTRODUCTION

Fine-wooled merinos in New Zealand have traditionally been farmed in the South Island high country regions centring around Otago where the climate is cold and dry. It was commonly accepted that it was unsuitable to farm Merinos in the lowplain areas of the South Island or hill country in the North Island where the climate is much warmer and wetter. Merino stock numbers remained low, at just over a million, for many years, however the dramatic downturn in the prime lamb industry and a significant increase in the premium for finer wools in world markets during the mid 1980's has stimulated an upsurge in Merino farming. The various non-traditional regions were investigated for Merino farming (Dobbie et al. 1985); a large scale Merino group breeding scheme was established (Land 1990) and screening for selection in Superfine Merinos was initiated at Tara Hills High Country Research Station (Wuliji et al. 1990). Further, in 1990, Invermay Agricultural Centre established a superfine Merino progeny test program on a private property near Burnham, Canterbury. The 570 Merino ewes were shifted from Tara Hills High Country Research Station (Lat. 44° 32', Long. 169° 54'; annual rainfall: 520 mm) to "Strathburn" Sandy Knolls property (43° 33' and 172° 28'; annual rainfall: 650 mm) near Burnham. The program aims to identify superior superfine sires for the fine wool industry and to demonstrate Merino farming in the low plain environment. This paper presents the results of two consecutive years performance of Merino ewes shifted from the high country to the low plains.

MATERIALS AND METHODS

The progeny test Merino ewe flock was formed from Tara Hills local control (LC, n = 120), Superfine flock (SF, n = 162), Commercial flock (n=118) and rising 2-tooth ewes (TT, n = 170). Ewes from LC, SF and TT had the previous year's performance records at Tara Hills available and these groups were

monitored in detail and analysed across the consecutive production years and between the flock of origin. The LC and SF ewes had equal numbers born in each year between 1984 and 1987 while TT ewes were born in 1988. As the heaviest culling was carried out on coarser FD the LC group was subsequently reduced disproportionally.

After the flock was transferred from Tara Hills to "Strathburn" Sandy Knolls property, ewes were grazed and managed together as one mob. Ewes were joined in late March, lambed in August and shorn in late July pre-lambing in the past consecutive two years. Animal performance was recorded for spring live weight (SLW), greasy fleece weight (GFW), clean fleece weight (CFW), yield and fibre diameter (FD).

Data from each year were analysed by least squares methods. The age and flock of origin (LC/SF) was included in the model and means presented for a particluar effect are adjusted for the other effect. The TT data were analysed separately to compare the two year's production at Strathburn.

RESULTS AND DISCUSSION

The comparisons of live weight, fleece weight and wool characteristics of ewes from LC and SF at the two locations are shown in Table 1. All traits measured except yield were markedly increased after transferring to low plains. The SLW of both flocks increased by an average of 8 kg in the first year and a further 6 kg in the second year; which was largely due to better winter grazing condition at low plains. A small but a significant difference was found in fleece weights with LC higher than SF. However, FD remained significantly ($p < 0.001$) lower for SF than its LC contemporaries even though the SF flock did coarsen its FD by 0.3 μm in the first year and a further 0.5 μm in the second year. The FD increase in both flocks was similar, however, as heavy culling was applied on coarser FD, a lower ratio of LC ewes was present in the second year which might under-estimate the increase in the LC flock.

The SLW, CFW, FD and yield were significantly ($p < 0.051$) increased for TT in 1991 compared to its 1990 records as rising two tooths (Table 2). These differences resulted mostly from added maturity, live weight increase and the better pasture conditions.

The advantages of farming Merinos on the low plains are an increase of 10-15 kg in live weight, 0.25 - 0.5 kg fleece weight and 10 - 20% lambing rate, but there is also a 0.5 - 0.8 μm fibre diameter increase compared with typical high country (Tara Hills) norms. Although the increased FD may reduce per unit value of wool the improved fleece weight, live weight (or carcass weight of culls) and lambing rate out-weighed this disadvantage. There are other associated benefits such as a lower vegetable matter content in wool, and increased staple length and strength.

In practical husbandry, it was cautiously noted that farming Merinos on low plains appeared to result in a greater incidence of fleece rot (ie low plains 10% vs high country 2%) and a higher cost of flystrike and footrot treatments (Burnett, person. comm). The early introduction of Merinos into the North Island of New Zealand has also provided a practical evidence that Merinos have adapted well in the high rainfall (1200mm) hill country in the Waikato region (37° 52', 175° 20') but they were more prone to footrot and scald than long wool sheep, with 28% of Merinos affected in comparison with 9% of Romneys (Dobbie et al. 1985).

Table 1. Live weight and wool production performance of mixed age ewe flocks: Tara Hills local control vs superfine flocks (year born 1984-1987)

Year	Location	Flock	n	SLW (kg)	GFW (kg)	CFW (kg)	FD (μm)	Yield (%)
1989	Tara Hills	LC	119	50.8^{NS}	4.36^{NS}	3.05^{NS}	20.2***	75.8**
		SF	162	49.7	4.02	2.99	18.4	74.4
		SED		0.7	0.06	0.05	0.1	0.5
1990[a]	Strathburn	LC	119	57.6^{NS}	4.61**	3.40**	20.4***	73.6^{NS}
		SF	162	57.1	4.40	3.23	18.7	73.8
		SED		0.8	0.07	0.06	0.1	0.5
1991	Strathburn	LC	76	64.0^{NS}	4.66**	3.46**	20.8***	74.2^{NS}
		SF	142	62.4	4.40	3.26	19.2	73.8
		SED		1.0	0.09	0.07	0.1	0.7

^{NS} non significant; * $p<0.05$; ** $p<0.01$; *** $p<0.001$

[a] The shearing at Strathburn was 1½ months earlier than Tara Hills therefore fleece weights were adjusted to 12 month growth.

Table 2. Live weight and wool production performance of 2-tooth ewes (born 1988)[#] in the two consecutive years

Production Year	n	SLW (kg)	GFW[a] (kg)	CFW[a] (kg)	FD (μm)	Yield (%)
1990	170	48.5 ±0.5	4.55 ±0.04	3.36 ±0.03	18.4 ±0.1	73.8 ±0.4
1991	136	58.5 ±0.6***	4.64 ±0.04^{NS}	3.52 ±0.03*	19.1 ±0.1***	76.0 ±0.4***

^{NS} non significant; * $p<0.05$; ** $p<0.01$; *** $p<0.001$

[a] The shearing at Strathburn was 1½ months earlier than Tara Hills therefore fleece weights were adjusted to 12 month growth.

#: These animals were shorn as hogget at Tara Hills and shifted to Strathburn as 2-tooth.

Table 3. The spring live weight, clean fleece weight and fibre diameter at different age groups for production year 1991 (pooled for LC and SF)

Age Group	n	SLW (kg)	GFW (kg)	CFW (kg)	FD (μm)	Yield (%)
4 (year born 1987)	81	62.5^{a}	4.40^{b}	3.33^{c}	20.1^{b}	75.8^{b}
5 (year born 1986)	55	64.7^{a}	4.18^{a}	3.12^{b}	19.9^{ab}	74.3^{a}
6 (year born 1985)	49	64.1^{a}	4.09^{a}	2.99^{ab}	20.0^{ab}	73.2^{a}
7 (year born 1984)	33	61.5^{a}	3.98^{c}	2.90^{a}	19.7^{a}	72.6^{a}
Average SED		1.5	0.08	0.07	0.2	0.7

abc : Mean carried a different superscript differ significantly at $P<0.05$.

The SLW, CFW and FD of Merino ewes (pooled data) farmed in low plains showed age gradients (Tables 2 and 3), such that CFW peaked at 4 year old ($P< 0.05$), while SLW and FD peaked at 4 to 6 year old and were declined at 7 year old. These values agreed with previous findings in Australian Merinos (Brown et al. 1966).

CONCLUSION

This trial indicated that the genetically superfine merinos have the potential to increase live weight and fleece weight while retaining good fleece qualities in the low plains. Merino farming can be successful in a wider non-traditional area if careful and appropriate animal husbandry is adopted.

ACKNOWLEDGEMENTS

The authors are pleased to acknowledge the contribution of Peter and Marian Burnett, "Strathburn", Sandy Knolls who was responsible for animal management and farming and their generous offer to carry out this trial on their property.

REFERENCES

BROWN, G.H.,TURNER, Helen N., YOUNG, S.S.Y. and DOLLING, C.H.S. (1966). *Aust. J. Agric. Res.* **17**:557.

DOBBIE, J.L., HICKEY, S M, and SMART, S H. (1985). Proc. Ruakura Fmrs Conf. **37**:16.

LAND, J.T.J. (1990). Proc. AAABG. Conf., **8**:231.

WULIJI, T., LAND, J.T.J., ANDREWS, R.N. and DODDS, K.G. (1990). Proc. NZSAP. vol. **50**:301.