

## Relative efficiency of five merino and Merino-type dam lines in a terminal crossbreeding system

By Dr. Daan Poggenpoel,  
as summarized from a scientific paper published by

S.W.P. Cloete, J.J.E. Cloete, A. Durand and L.C. Hoffman in the  
*South African Journal of Animal Science* 2004, 34(3), pp 135 – 143

In this scientific terminal crossbreeding experiment, five Merino and Merino-type dam lines were crossed to Dormer and Suffolk rams. The five dam lines were:

- South African Mutton Merino (SAMM).
- A Cross between SAMM rams and Merino ewes (SAMM cross line).
- Dohne Merino ewes.
- A Merino line selected for fleece weight with a check on fibre diameter (FW+).
- A Merino line selected for the ability to rear multiples per joining (Rep+).

The experiment was carried out at the Langgewens experimental farm near Malmesbury in the Swartland and evaluations were done over a four-year period. About 40 ewes of each line were annually joined during February and March. It was attempted to slaughter all lambs at a live weight of approximately 38-40 kg. Carcasses were classified according to standard regulations. On average 87 percent of the carcasses were graded as A1, with no difference between lines. Ewes were shorn during May and fleece measurements determined individually. At the end of the experiment adult ewes were

also slaughtered. There were no differences between the results of the two ram breeds for all traits measured.

Feeding costs are considered a major cost item for commercial sheep production. Live weight and growth rates were used to calculate energy requirements of ewes and lambs. Energy requirements were used for calculation of small stock units (SSU), where 1 SSU is equivalent to 11.25 MJ ME/day. Dr Tino Herselman explained in a personal communication that this is the energy in about 1.5 kg of lucern hay. For production and growth of lambs a 50 kg ewe will need about 915 kg lucern over a year, and a 60 kg ewe about 1115 kg.

The more important results of the experiment are given in **Table 1**.

The SAMM line weighed about 20% heavier than the Merino lines, with wool production about half that of the Merino lines and the Dohne roughly on the mid-parent value between these two parent breeds. The Merino and Dohne had a better staple strength than the SAMM, but there were only small

differences in fibre diameter. The Merino and Dohne wool prices were markedly higher than that of the SAMM, resulting in a much higher wool income.

SAMM lambs reached slaughter age at 134 days, significantly earlier than the 164 days of the Merino lines. There were small differences in slaughter weight, dressing percentage and carcass weight, with the Merino lines having lower slaughter weights than the other.

Calculations of gross return per small stock unit, where feed requirements for live weight and growth are taken into account, gave the following results: R 285 for SAMM ewes, R 306 for SAMM cross ewes, R 322 for Dohne Merino ewes, R 354 for FW+ Merino ewes and R 365 for Rep+ Merino ewes, when prices of the 2004 season were used.

The average gross income per small stock unit of the two Merino lines (R 360), which had the highest income in this experiment, was 12 percent or R 38 more than that of the Dohne Merino, and 26 percent or R 75 more than the SAMM line.

From these results the authors did simulations of gross income of these dam lines at different ratios of clean wool price to meat price. The results are presented in **Figure 1** for ratios of 1 : 0.78 to a ratio of 1 : 2.35. The results demonstrate that over this range the two Merino lines outperform all other lines in gross income per small stock unit.

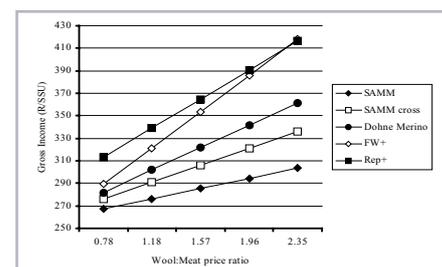
The **conclusion** from this experiment was that the combination of relatively small size with acceptable reproduction and high levels of fibre production resulted in the purebred Merino lines being extremely competitive in terms of economic yield.

**Table 1 Means of production and reproduction measurements for the five dam lines**

	SAMM	SAMM cross	Dohne	FW+ Merino	Rep+ Merino
Ewe live weight - kg	67.4	65.5	65.1	56.7	54.7
Clean fleece weight - kg	2.20	3.24	3.53	4.81	4.19
Staple strength - (N/ktex)	28.4	31.9	37.3	40.7	35.9
Fibre diameter - micron	23.5	23.0	22.0	22.9	22.4
Wool price (clean) - R/kg	29.3	33.1	37.0	39.5	37.5
Slaughter age of lambs - days	134	143	142	164	165
Slaughter weight - kg	40.3	39.2	39.7	37.0	37.8
Dressing percentage	41.0	40.6	40.0	38.5	39.3
Carcass weight - kg	16.6	16.0	15.9	14.3	14.9
Price of lamb carcasses - R/kg	20.38	20.39	20.45	20.47	20.39
Slaughter lamb production per					
ewe joined : - number	1.07	1.16	0.99	0.90	1.12
- weight - kg	42.7	44.2	39.3	32.9	42.0
- carcass weight - kg	17.8	17.6	15.7	12.7	16.4
- lamb weight as % of LW	67.7	70.2	63.3	59.7	83.4
Wool income per ewes per year - R	64.46	107.24	130.61	189.99	157.13
Lamb income per ewe per year - R	362.76	358.86	321.06	259.97	334.40
Total wool + lamb income/ewe/yr - R	427.22	466.11	451.67	449.96	491.52
Gross return per SSU - R	285	306	322	354	365
Return per SSU as % of SAMM line	100	107	113	124	128

SSU = small stock unit

LW = live weight of ewes



**Figure 1** Gross income per small stock unit (SSU) for the respective ewe lines when assessed at different wool:meat price ratios