THE DOHNE MERINO IN SOUTH AFRICA

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SUMMARY

The Positioning of the Dohne Merino Breed in the South African small stock industry is quantified. Changes in breeding policy, resulting genetic change and environmental trends are presented. Possible global collaboration is stipulated.

INTRODUCTION

The Dohne Merino breed was developed at Dohne Research Station, Eastern Cape, South Africa with the initial purpose to breed wool bred sheep adapted to the harsh sourveld high rainfall conditions. The base population developed into a dual purpose breed for which an official breed society was established on 16 May, 1966. The breed gained international recognition with the establishment of the Australian Dohne Merino Society in 1999. The corner stone of the breed remains profitable production by means of relatively large flocks under commercially viable conditions. Breed improvement is based on scrutinizing large numbers of animals by means of objectively estimated breeding values supplemented by visual appraisal. The purpose of this paper is to outline the position of the breed in the South African small stock industry, to overview the current genetic improvement strategy and to mention possible international development in the near future.

The South African small stock industry-core statistics. Sheep numbers in South Africa declined from 30 million sheep in 1990 to 21 million in 2015. Concurrently wool bred sheep numbers declined by 7 million. The number of rams sold on official sales was used to estimate the market share of the Dohne Merino breed in the broader South African Merino sheep industry as 40.6 percent.

The Dohne Merino Breed Society increased to a total of 33,547 ewes in 2014. Despite a constant membership of 90 breeders, the expansion in population size in a declining industry is of some significance. The South African Dohne Merino Breed society is managed by a council consisting of 9 councilors. Membership is divided into 6 regions each with its own local management structure to promote the breed locally and to liaise with council.

Breeding objectives. *The South African economic climate*. Income generated from mutton production in absolute terms, increased dramatically from 1990 (R4.79, price per kg) to 2015 (R51.42, price per kg). Socio-economic factors dictated a decrease in mutton consumption of 30.6 percent from 1990 to 1996 where after consumption gradually increased to 93.6 percent of the level for 1990. Mutton imports are utilised when necessary to stabilize the local market at an average rate of 16.6 percent of total consumption.

The decline in wool production since 1990 (41.2 mil. kg. greasy wool), resulted from the decline in the total South African small stock population. During the same period, the average greasy wool price for merino sheep (including Dohne Merinos) increased from R6.98 to R68.63 (Table 1).

The trends in wool and mutton price indicate a long term change of 8 percent in ratio between the two prices in favour of mutton. Another significant change was the decline in the price premium (5 year rolling average used to calculate an economic weighting factor only) for fine wool by R2.00 per kg. clean wool.

Table 1: **Production and price of mutton and wool in South Africa**

Year	Mutton production (1,000 tons)	Mutton Imports (1,000 tons)	Mutton price (R/kg)	Greasy wool production (Million tons)	Greasy wool price (R/kg)
1990	206.0	17.3	4.79	74.6	6.98
1995	143.0	38.1	8.26	45.2	10.01
2000	159.0	55.1	14.62	33.5	15.52
2005	176.0	43.0	23.37	31.8	19.36
2010	155.0	8.1	40.48	31.5	43.58
2015	193.0	10.2	51.42	33.4	68.63

South African Dohne Merino policy. Economic changes necessitated the following breeding policy changes:

1 Selection for increased 12 months Body weight (initially an indirect selection criterion) was replaced by selection for growth rate, evaluated by weaning weight direct and maternal breeding values, at the end of 2013. Apart from economic considerations, 100 day measurement coincides with lamb marketing as (1) Slaughter lambs (2) lambs for feedlots or (3) veld prepared lambs marketed at a later stage. Snyman (unpublished) provided proof of 100 day measurement being accurate to estimate maternal ability of Dohne Merino ewes. The objective with this change was to promote early maturity and to retain fitness of the breed.

2 The relative importance of fibre diameter in the selection index decreased from 40.0 percent to 19.9 percent. At the same time, the amount of wool produced per head was maintained at a constant level.

It is generally accepted that the use of a selection index is the most effective method to pursue any breeding objective. In the case of South African Dohne Merinos within flock selection index averages serve as a benchmark to identify stud animals. This moderate minimum standard provides more than sufficient opportunities for individual breeders to pursue divergent within flock objectives. At this stage, insufficient proof of significant genotype by environmental interactions, hold back a final decision on the implementation of different selection indexes for different farming conditions and systems.

Genetic response. Genetic response and environmental change for the four measured traits in the Dohne merino selection Index is presented in Figure 1.

Limited response in maternal weaning weight is envisaged on account of low heritability. However maternal weaning weight was included in the selection index to improve on the non-significant trend in this trait (Figure 1). No significant change in environment (management) could be detected for both weaning weight and 12 months body weight.

Recently clean fleece weight increased very slightly (< than 100 gm. in 15 years) as possibly the result of a correlated response to selection for growth traits and less emphasis on fibre diameter. The reason being that South African breeders maintain a low wool production potential percentage (WPP%) in order to improve reproduction and retain hardiness and adaptability attributes of the breed.

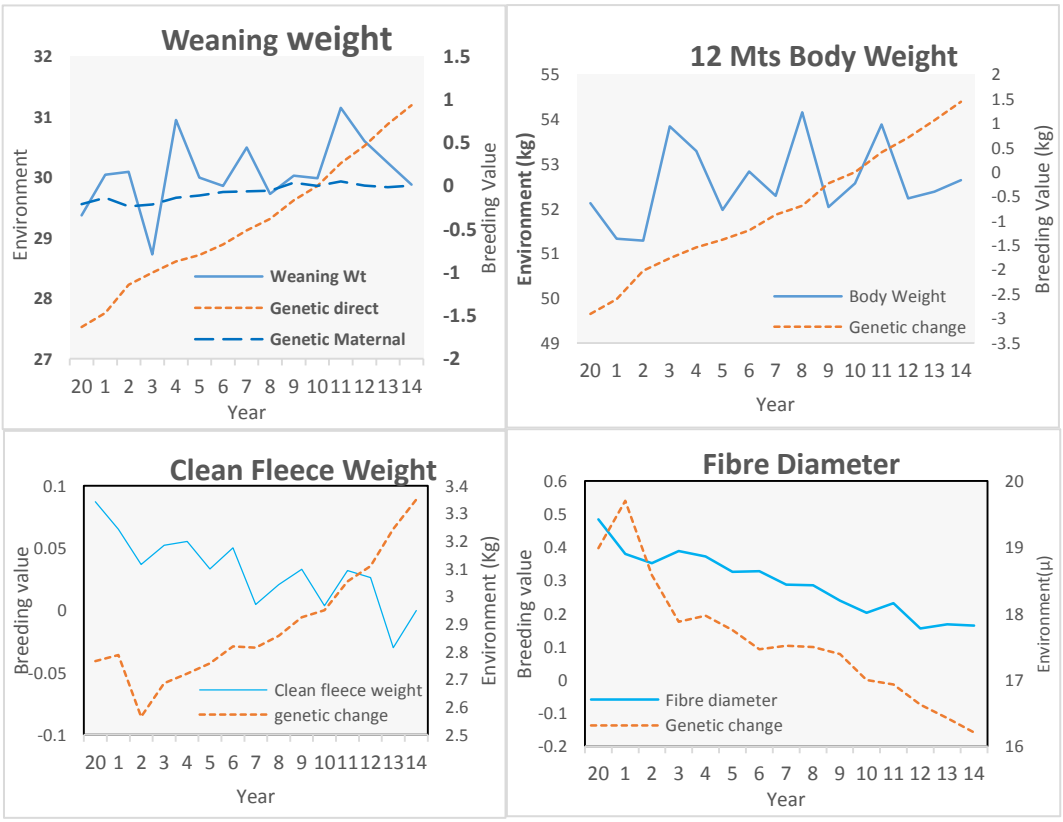

Figure 1: Genetic and environmental trends in production traits of South African Dohne Merinos.

A point of concern to breeders is the further possible decline in the genetic change of fibre diameter. Increasing reproduction and growth as well as the effect of "current gains" may explain this concern. The genetic outcome of the recent reduction in selection pressure on fibre diameter is awaited before more drastic decision making will be considered.

Future challenges: A South African perspective. The South African Dohne Merino model over the past 50 years resulted in a highly successful well established breed. The system is however in need of adjustments (Minutes Dohne Merino Council Meeting, 2016) to provide for the following aspects vital to survival and expansion of the breed:

1 Locally and internationally, genomic improvement and measurement of additional traits including resistance to parasites, carcass measurements and visual scores on a routine basis, pose a serious challenge to infrastructure and financing. The development of more advanced systems will have to be carefully balanced against the additional work load and possible returns

for individual breeders. The reality of breeders resorting back to less effective genetic improvement systems at lower cost will have to be seriously addressed by not only South African breeders but the seed stock industry at large.

2 Marketing strategies have to be more focused on the role of the Dohne Merino in cross breeding systems. Additionally the useful attributes of the breed to increase commercial output from hardy indigenous sheep breeds deserve more prominence.

3 Current veterinarian protocols jeopardise effective exchange of genetic material on an international basis. Improved understanding of the global animal health status of production regions may assist to alleviate this problem.

4 Common ground should be found on an international basis to expand and adapt current within country improvement systems for the purpose of international comparisons. Global expansion of the breed should be based on internationally agreed guidelines to ensure the continued existence of the true dual-purpose character and easy care attributes of the breed.

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