

**A MIXED MODEL EVALUATION FOR GROWTH  
AND REPRODUCTION PARAMETERS  
IN A SA MUTTON MERINO FLOCK**

**by**

**Carina Hartman**

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**Promotors: Mr. G.T.J. Vermeulen  
Dr. G.J. Delpport**

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## SUMMARY

Records of the La Rochelle S.A. Mutton Merino stud were analysed to determine the importance of possible contributing non-genetic sources of variation on growth and reproductive traits. Growth traits analysed were pre-weaning weight (42dW), weaning weight (100dW), 205d weight, ADG's and Kleiber Ratio's (KR) for both 42d and 100d. All the included effects, i.e. year, sex, birth status, season, age of dam and the year x sire interaction, were highly significant ( $P < 0.001$ ) for the growth traits. Reproduction traits measured were mean number of lambs born per ewe per year, mean Kg lamb weaned per ewe per year, percentage twins and fecundity. Year was the only significant effect ( $P < 0.001$ ) for all four reproduction traits.

Data of records between 1974 and 1995 were used to estimate additive direct and additive maternal heritabilities for seven growth traits. The estimates of the direct heritabilities varied between 0.166 for 42dW and 0.513 for 205dW. The estimates of the maternal heritabilities were within the 0.042 (42dW) to 0.370 (100dADG) range. Estimates of the covariance between the direct additive and maternal additive components were generally negative and of a substantial size (-0.215 to -0.674).

Additive direct and additive maternal heritabilities for four reproductive traits were also estimated. The estimates for direct additive heritabilities varied between 0.039 for fecundity and 0.177 for Kg lamb weaned per ewe per year. Estimates for the maternal additive heritabilities were correspondingly low, varying from 0.007 for lambs born per ewe per year to 0.197 for percentage twins. Estimates of covariance between the additive direct and additive maternal components were negative.

Genetic trends of the flock were studied. The main objective of the breeder was to improve the reproductive efficiency of the flock, whilst decreasing the incidence of very large lambs. Selection pressure on reproductive performance hasn't yet attained the desired effect as three of the four reproductive traits measured, showed very little or no improvement. Lambs do however have lower body weights, while the 100dADG and 100dKR have improved.

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