ESTIMATION OF GENETIC AND PHENOTYPIC PARAMETERS IN NEW ZEALAND ROMNEY SHEEP

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ABSTRACT

Genetic and phenotypic parameters were estimated from liveweight and fleece data recorded on 1604 New Zealand Romney lambs between 1970 and 1972. The flock into which the lambs were born is located at Woodlands Research Station near Invercargill. The data analysed are from the establishment phase of a long-term selection experiment; the flock was closed for selection in 1973.

The traits studied were birthweight (BWT), docking weight (DWT), weaning weight (WWT), April liveweight (APR), June liveweight (JUN), August liveweight (AUG), November liveweight (NOV), 2-tooth liveweight (2TH), lamb fleece weight (LFW), hogget fleece weight (HFW), staple length (STL), quality number (QNO), character (CHR), fleece colour (COL) and break severity (BRS).

Restricted maximum likelihood (REML) estimates of the variance components were obtained. These were used in the generation of paternal half-sib estimates of the heritabilities (h^2), the inter-trait genetic (r_g) and phenotypic (r_p) correlations, and the best linear unbiased estimates (BLUE) of the non-genetic (fixed) effects.

The estimates of the h^2's for the liveweights ranged from 0.08 for BWT, increasing through to 0.13 for 2TH. These estimates are lower than most of the values previously published (generally, from 0.2-0.4, respectively), although they are comparable with many of the more recent h^2 estimates for liveweight.

The estimates of h^2 for the fleece traits were generally similar to the estimates of previous studies. Estimates of 0.19 and 0.30 were obtained for LFW and HFW, respectively, and 0.37 for STL. The

fleece quality traits were found to have h^2 estimates ranging from 0.07 for BRS to 0.56 for QNO.

The estimates of the genetic and phenotypic correlations between the traits studied were comparable with estimates from previous studies in most cases. Important exceptions include the low genetic correlations of WWT with the liveweights from JUN (of 0.38) through to 2TH (of 0.50).

The BLUE's of the fixed effects generally agree well with the estimates of previous studies. Year-of-birth, birth-rearing rank and date-of-birth effects were significant for all the traits studied. In addition, age-of-dam effects were significant for all the liveweights, and sex effects were significant for BWT, DWT and WWT.

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