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ESTIMATES OF GENETIC VARIATION AND COVARIATION FROM NEW ZEALAND NATIONAL BOAR PERFORMANCE TESTING DATA

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A preliminary genetic analysis was undertaken of boar performance test data collected over a 19-month period from October 1972. The records analysed came from 372 Large White and 286 Landrace boars which represented 108 and 73 sires, respectively.

The boars were paternal half-sib pairs which started test at 23 kg and finished at 82 kg liveweight. Boar pairs were group penned but individually fed. Data for each boar consisted of growth rate (kg/day) (1), feed conversion ratio (kg feed/kg liveweight gain) (2) and the sum of four ultrasonically measured backfat depths (mm) (3). A standard diet was used together with a scale of feeding based on individual liveweight.

Genetic parameters were estimated from a half-sib analysis fitting sires within breed and farm of origin. The results showed that Large White boars grew slightly faster and more efficiently than Landrace boars, but fat depths were similar. Marked seasonal trends, sigmoidal in form, were observed for growth rate and the feed conversion ratio. A stepwise multiple regression analysis fitting the data to the day at the end of test, transformed by taking all powers up to the twelfth, accounted for up to 22 and 24% of the variation in growth rate and feed conversion, but only 2% for backfat. Accordingly, daily gain and feed conversion were adjusted for the day at end of test, but backfat was not adjusted for genetic analysis. Values calculated for phenotypic correlations were: $r_{12} = 0.88$, $r_{13} = -0.26$ and $r_{23} = 0.52$; genetic correlations $r_{12} = -0.92$, $r_{13} = -0.17$ and $r_{23} = 0.56$. Heritability estimates were: 1.02 ± 0.29 growth rate, 0.77 ± 0.28 feed conversion ratio, and 0.86 ± 0.28 for backfat depth. Correlations were less antagonistic to the improvement of the separate traits than those in the index currently used. However, heritability estimates were much higher than expected possibly due to deviations from the assumption of random mating, confounding of sires with seasonal variation and/or the effects of selection among sires.

Further study of these possibilities is desirable before attempting a full revision of the index currently in use for national boar performance testing.