GENETIC AND ENVIRONMENTAL FACTORS AFFECTING PERFORMANCE TRAITS OF STRAIGHTBRED ANGUS AND FRIESIAN-SIRED CALVES

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ABSTRACT

Genetic and environmental parameters for calf growth traits were determined from data collected over a 5-year period at the Whatawhata Hill Country Research Station, Hamilton, using least squares mixed model procedures. From a total of 497 female and 460 male calves sired by 29 Friesian bulls and from Friesian, Friesian-Jersey, Angus and Friesian-Angus dams, paternal half-sib heritability estimates were close to zero for both sexes of calf. Higher heritabilities were calculated by the same method using records from 179 female and 161 male straightbred Angus calves, the progeny of 17 bulls, and giving females first and males second were: birth weight, -0.14 and 0.44; pre-weaning growth rate, 0.19 and 0.29; and weaning weight, 0.25 and 0.40. Because of large standard errors, the differences between calf sexes were not conclusive.

Genetic correlations between birth weight and pre-weaning growth rate and birth weight and weaning weight calculated for the Angus males were 1.06 and 1.07, respectively, and the genetic correlations between pre-weaning growth rate and weaning weight calculated for all individuals except the Friesian-sired female calves ranged from 0.88 to 1.06. Other genetic correlations were not obtained because negative sire components of variance precluded their estimation.

The ranges of the phenotypic correlations were: birth weight and pre-weaning growth rate, 0.07 to 0.43; birth weight and weaning weight; 0.25 to 0.61, and pre-weaning growth rate and weaning weight, 0.85 to 0.98.

An investigation of cow - calf weight relationships using 340 Angus and 404 Friesian cow - calf pairs showed that heavier Friesian cows gave birth to significantly heavier calves, such that every 10 kg increase in cow liveweight was associated with an approximate 0.40 kg increase in calf birth weight.

Regressions of weaning weight on dam liveweights showed that heavier Angus cows weaned significantly heavier male calves by approximately 0.45 kg per 10 kg increase in cow weight. The other associations for the remaining animals were considerably smaller and non-significant.

The findings of this study suggest that where Friesian sires are used, genetic improvement in calf growth characters would be slow and less effective than in Angus cattle. The genetic parameters for the Angus breed compare favourably with the majority of published estimates while comparable findings for dairy breeds and dairy x beef crossbreds are few in number.

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