IS CROSSBRED PROGENY PERFORMANCE CONSISTENT WITH THEIR SIRE ESTIMATED BREEDING VALUES (EBVS)?

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Crossbreeding in the southern Australian beef industry has been recognized for some time as being a tool to increase productivity (Morgan *et al*. 1992). Selection of sires based on objective measurement has been refined with the development of BREEDPLAN, with the result that the combined effects of genetic changes on each beef-producing herd has been estimated at $9,170 per year for the last 30 years (MLA 2002). The relative genetic merit of candidates for selection in breeding programs is now widely available, with sires having the highest/optimum ranking for the chosen trait/traits usually being chosen. Currently across-breed evaluation is not available. Assumptions rather than direct comparisons of a sires estimated breeding value (EBV) are used to compare sires across breeds.

Data was collected from over 2,600 progeny out of Angus and Hereford cows joined to 88 sires; 22 Angus (Ang), Hereford (Her), Limousin (Lim) and Simmental (Sim). The bulls' EBVs had high accuracy (75%) and were chosen so that a similar number of bulls per breed were represented in each percentile band for 400-day growth EBVs (400d EBV). Data was analyzed using residual maximum likelihood (REML), using age, calf sex, bullbreed, dambreed and sire EBV for the particular trait, to examine the effect of EBV. Progeny liveweight was predicted for each sire and the correlations ($P<0.001$) between the predicted mean liveweights of the progeny of each sire and various growth rate EBVs for each breed are shown in Table 1 (relevant effects in bold). Apart from the 600-day liveweight trait ($P=0.013$), there was no significant interaction between dam breed and sire EBV.

Table 1. The Correlation between the predicted liveweight trait and sire EBVs

Sire breed	Trait	BirthWt EBV	200d EBV	400d EBV	600d EBV
Ang	Birth-Weight	**0.758**	0.423	0.422	0.465
Her	Birth-Weight	**0.411**	0.203	0.284	0.250
Lim	Birth-Weight	**0.382**	0.573	0.511	0.378
Sim	Birth-Weight	**0.445**	0.241	0.245	0.238
Ang	Wean-Weight	0.417	**0.652**	0.611	0.598
Her	Wean-Weight	0.566	**0.553**	0.551	0.605
Lim	Wean-Weight	0.225	**0.403**	0.484	0.348
Sim	Wean-Weight	0.307	**0.494**	0.527	0.523
Ang	200d-Weight	0.538	**0.682**	0.646	0.636
Her	200d-Weight	0.732	**0.738**	0.705	0.686
Lim	200d-Weight	0.348	**0.568**	0.583	0.400
Sim	200d-Weight	0.230	**0.428**	0.490	0.466
Ang	400d-Weight	0.586	0.851	**0.843**	0.878
Her	400d-Weight	0.354	0.519	**0.593**	0.640
Lim	400d-Weight	0.450	0.535	**0.490**	0.371
Sim	400d-Weight	0.461	0.440	**0.384**	0.487
Ang	600d-Weight	0.532	0.768	0.750	**0.790**
Her	600d-Weight	0.509	0.588	0.605	**0.716**
Lim	600d-Weight	0.065	0.430	0.381	**0.399**
Sim	600d-Weight	0.425	0.647	0.611	**0.697**

Whilst these preliminary results indicate that the EBV for the respective liveweight trait can be expected to be a reliable indicator of likely progeny differences regardless of dam breed, there is an indication that breeds respond differently, with the Angus generally producing the strongest response. Since these data included only two dam breeds, and these breeds could be considered to be of similar biological type, a dam of different genotype may give a different response than these two breeds.

MORGAN, J.H.L, CLARK, A.J, AND GRAHAM, J.F. (1992). *Anim. Prod. Aust.* **19**, 17.
MLA (2002). Meat and Livestock Australia, *Proc. National Beef Genetics Workshop*, Sydney, 4th Dec. 2001

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