

Molecular Value Predictions: Associations With Beef Tenderness in Brahman Cattle

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Recently, panels of gene markers have become available that allow for Molecular Value Predictions (MVPs) that represent a molecular breeding value to be calculated for economically important traits (Anon. 2009). This study tested the hypothesis that Molecular Value Predictions (MVPs) generated for tenderness from a commercially available marker panel would have favourable associations with beef tenderness. It also tested the hypothesis that the MVPs for marbling and feed efficiency would not have unfavourable associations with beef tenderness. Two experiments, one in NSW and one in WA, designed to examine tenderness gene marker effects and interactions within Brahman cattle (Cafe *et al.* 2010), were used to test the above hypotheses.

Cattle were selected at weaning from 12 commercial and research herds based on their genotype for commercially available calpastatin (*CAST*) and calpain3 (*CAPN3*) gene markers, and μ -calpain (*CAPN1-4751* and *CAPN1-316*) gene marker status was also determined. The NSW study comprised 79 heifers and 82 steers and the WA herd had 135 steers. Cattle were backgrounded at pasture for 6 to 8 months and grain-fed for 117 d (NSW) or 80 d (WA) before slaughter. Half of the cattle at each site were implanted with a hormonal growth promotant (Revalor-H) during grain finishing. Statistical analyses were as described by Cafe *et al.* (2010) except for the exclusion of terms for calpain system gene markers, and the inclusion of single MVPs as covariates.

A favourable Tenderness MVP was associated with more tender beef from the striploin (LD) following aging and tenderstretch carcass suspension in both experiments (Table 1). There were no significant associations between Marbling MVP and beef tenderness, or between Feed Efficiency MVP and beef tenderness apart from a tendency towards a negative association for 7d aged striploin in the NSW experiment.

Table 1. Effects of Molecular Value Predictions (MVP) on shear force (N) for achilles (AT) and tenderstretch (TS) suspended *m. longissimus* (LD) and achilles suspended *m. semitendinosus* (ST) aged for 1 or 7 d in Brahman cattle in the NSW (n =161) and WA (n = 135) experiments

Trait	Site	Tenderness MVP			Marbling MVP			Feed Efficiency MVP		
		Slope	SE	P	Slope	SE	P	Slope	SE	P
LD AT 1d aged	NSW	6.2	8.33	0.46	14.2	11.3	0.21	3.3	6.64	0.62
	WA	1.0	6.11	0.87	6.0	8.04	0.46	8.2	5.16	0.12
LD AT 7d aged	NSW	15.5	7.99	0.06	6.9	10.6	0.51	-11.2	6.19	0.07
	WA	17.8	5.14	0.001	7.8	7.12	0.27	-2.1	4.78	0.66
LD TS 1d aged	NSW	7.2	2.48	0.004	-2.9	3.39	0.39	-1.6	1.98	0.43
	WA	11.0	6.15	0.08	-0.81	8.10	0.92	0.41	5.30	0.94
LD TS 7d aged	NSW	4.9	2.61	0.07	1.7	3.49	0.62	-2.9	2.03	0.15
	WA	11.0	4.97	0.029	-10.4	6.96	0.14	-0.35	4.49	0.94
ST AT 1d aged	NSW	6.0	3.13	0.06	-2.0	4.21	0.64	2.0	2.43	0.41
	WA	5.4	4.47	0.23	3.0	5.91	0.61	-3.7	3.83	0.34
ST AT 7d aged	NSW	4.5	3.04	0.14	-5.7	4.12	0.17	-1.0	2.37	0.68
	WA	3.9	3.39	0.25	-0.28	4.48	0.95	0.65	2.92	0.82

This study shows that the Tenderness MVP has favourable significant associations with beef tenderness in Brahman cattle, particularly in 7d aged and tenderstretched striploins. Further analyses are in progress to assess associations of the MVPs with consumer sensory eating quality and with marbling and feed efficiency.

Anon. (2009). Technical Summary, March 2009. (Pfizer Animal Health Animal Genetics, Albion)

Cafe L.M., McIntyre B.L., Robinson D.L., Geesink G.H., Barendse W., Thompson J.M., Pethick D.W. and Greenwood P.L. (2010). *J. Anim. Sci.* (submitted).

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