

Using Hereford bulls can improve economic value of steer carcasses from Angus cows

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Studies investigating the benefits of Hereford by Angus crossbreeding in the US have demonstrated the value of utilising heterosis. Carcasses of crossbred calves were heavier but had less fat and marbling (Cundiff *et al.* 1974a,b; Koch *et al.* 1985). Daley & Earley (2013) found that Hereford cross Angus (Black Baldy) calves had better pre-weaning growth but that pure Angus had better quality carcass grades. This study was undertaken to identify the benefits of crossing Hereford bulls over Angus cows under Australian commercial conditions.

Over three breeding seasons, 1000 Angus cows and heifers were mated to leading Hereford or Angus bulls, producing Hereford cross or pure Angus calves. The cattle were raised on pasture at Musselroe Bay, Tasmania. Traits included calving ease, birth weight and weaning weight of all calves, and carcass traits and meat quality of steers (avg. 685 days). To account for variation due to seasonal differences (2015, 2016 & 2017) and dam age (H, J, K or L drop), a contemporary group combining them with 8 levels was used as a factor in the analysis (cow year group). Angus calves were on average 4.7 days younger so calving time (early (first 24 days of calving), medium (25-47 days after calving started) or late (48 plus days)) was used as a factor. Age was also fitted as a covariate within cow year group to adjust for differences due to calf age.

The proportion of dead calves was highest for Hereford sired calves born to heifer dams (10.0%). There was no difference between Hereford and Angus sires for calf loss when mature cows were used (Table 1). Hereford sired calves had higher (+6.3%) calving ease scores (greater difficulty) than Angus sired calves. Hereford sired calves were heavier at birth (+7.7%) and weaning (+3.1%). Carcasses were heavier (+3.6%) and fatter (+8.2%) and had greater EMA (+2.2%) but lower marbling scores (-10.0%) and less IMF (2.7 vs 3.7%). When HSCW was fitted as a covariate P8 Fat and EMA were no longer significant. Carcasses of the Hereford crosses had a significantly darker meat colour score (+6.1%) and lower brightness (-1.7%). There were no significant differences in meat pH, cooking loss or shear force.

Table 1. Sirebreed comparisons of birth, carcass and meat measurements.

Trait	Count	Angus sire	Hereford sire	Diff. (%)	Sig
Calf Loss (%) - Heifer	638	5.1 ± 1.3	10.0 ± 1.3	+96.1	P<0.001
Calf Loss (%) - Cow	965	2.5 ± 1.0	2.5 ± 1.3	0	n.s.
Calving Ease (Score)*	1584	1.12 ± 0.02	1.19 ± 0.02	+6.3	P<0.01
Birthweight (kg)	1612	33.8 ± 1.6	36.4 ± 1.6	+7.7	P<0.001
Weaning Weight (kg)	1419	245.6 ± 10.0	253.2 ± 10.0	+3.1	P<0.001
HSCW (kg)	634	298 ± 17	309 ± 17	+3.6	P<0.001
P8 Fat (mm)	640	7.3 ± 1.7	7.9 ± 1.7	+8.2	P<0.10
EMA (cm ²)	640	85.9 ± 5.9	87.8 ± 5.9	+2.2	P<0.05
MSA Marbling	640	331 ± 36	298 ± 36	-10.0	P<0.001
Meat Colour	610	3.3 ± 0.5	3.5 ± 0.5	+6.1	P<0.10
IMF (%)	610	3.7 ± 0.80	2.7 ± 0.8	-27.0	P<0.001
L (brightness)	610	40.5 ± 1.6	39.8 ± 1.6	-1.7	P<0.001

* Calving Ease Score: 1 = unassisted,...5 vet assisted,

Using Hereford bulls can improve economic value of carcasses from multiparous Angus cows. If Hereford sires were mated to mature cows only and not to heifers, calf loss could be avoided. The increase in HSCW was 3.6% so for pure Angus steers to be equivalent they would need to attract a premium price per kilogram of 3.6%. Pitchford *et al.* (2002) crossed Hereford and Angus bulls to Hereford cows and found the opposite effect to that shown therein. Thus, it is likely that the Hereford advantage is due to heterosis. The use of Hereford sires impacted on meat quality with less intramuscular fat and darker meat colour.

References

- Cundiff LV, Gregory KE and Koch RM (1974a) *J. Animal Science* **38** 711-727.
Cundiff LV, Gregory KE, Schwulst FJ, and Koch RM (1974b) *J. Animal Science* **38** 728-745.
Daley DA and Earley SP (2013) *Harris Heterosis Report*. [Accessed 25 March 2014]
Koch RM, Dickerson GE, Cundiff LV, and Gregory KE (1985) *J. Animal Science* **60** 1117-1132.
Pitchford WS, Deland MPB, Siebert BD, Malau-Aduli AEO, and Botema CDK (2002) *J. Animal Science* **80** 2825-2832