

GENOTYPE AND GROWTH RATE EFFECTS ON MARBLING, INTRAMUSCULAR FAT AND EATING QUALITY IN FEEDLOT-FINISHED BEEF CARCASSES

E. TOOHEY^{AE}, J.F. WILKINS^B, J. IRWIN^C, W.A. MCKIERNAN^D and B. KING^E

^A (Present address) NSW Agriculture, Agricultural Research and Advisory Station, Cowra, NSW 2794

^B NSW Agriculture, Agricultural Institute, PMB, Wagga Wagga, NSW 2650

^C NSW Agriculture, Agricultural Institute, PMB, Yanco, NSW 2703

^D NSW Agriculture, Locked Bag 21, Orange, NSW 2800

^E School of Agriculture, Charles Sturt University, Wagga Wagga, NSW 2650

Intramuscular fat (IMF), measured directly by laboratory analysis, or estimated by the more common commercially used system of marble score (at abattoir chiller assessment), is an important beef carcass trait affecting product specification, meat eating quality and carcass value. This paper reports effects on marbling, IMF and eating quality due to altering growth rate in steers with varying genetic potential for fat deposition.

Data comes from an ongoing study described previously (Wilkins *et al.* 2002). Steer progeny of 40 sires with a wide range of carcass types, based on their genetic potential for carcass intramuscular fat and/or yield, were grown at fast or conventional rates (~ 0.8 or 0.6 kg/d) from weaning to feedlot entry. Cohorts from different calving seasons were managed to achieve group mean feedlot entry weights of 400 kg at the same time (groups differing in age by 5-7 months). They were finished together in a commercial feedlot (around 100 days on feed). At slaughter, MSA (Meat Standards Australia) chiller assessment data were collected. We examined data from 2 such feedlot intakes and, for the first, samples were also taken from the *longissimus dorsi* muscle at the 12/13 rib quartering site for laboratory assay of IMF, and for MSA taste panel evaluation of eating quality. Data were analysed by the Genstat REML procedure, with main effects of carcass type and growth rate, and accounting for variation between sires within type.

Table 1. Least squares means for marble scores, intramuscular fat (IMF%) and CMQ4 (eating quality) in crossbred steers given different growth treatments (slow and fast) post weaning (AngY, AngM and AngYM are Angus sires chosen on EBV for high retail beef yield, high marbling or both; Ch (Charolais) and Lim (Limousin) from high yielding European cattle; WB (Black Wagyu) and WR (Red Wagyu) from expected high marbling breeds).

	Growth	AngY	AngM	AngYM	Ch	Lim	WagB	WagR	Sig.Type lsd	Average	Sig. of growth
Marble score											
First group	Slow	1.35	1.47	1.60	1.16	1.03	1.75	1.23	P<0.01	1.37	ns
	Fast	1.28	1.81	1.73	1.03	1.07	1.40	1.55	lsd 0.47	1.41	
Second group	Slow	1.66	1.65	1.57	1.68	0.60	1.92	1.69	P<0.01	1.54	ns
	Fast	1.38	1.83	1.69	1.25	1.26	1.59	1.65	lsd 0.45	1.52	
First group only											
IMF%	Slow	4.41	4.79	5.52	3.19	3.50	6.10	4.15	P<0.01	4.52	P<0.05
	Fast	4.22	7.31	6.12	3.87	3.93	4.52	5.25	lsd 2.04	5.03	
CMQ4	Slow	62.4	69.1	66.6	66.0	55.2	65.1	61.4	P=0.06	63.7	ns
	Fast	60.9	68.5	68.8	66.4	56.9	67.9	67.6	lsd 12.8	65.3	

There were significant differences due to genotype in all traits (Table 1). Performance was generally in line with the supposed genetic potential. The data also suggested at least equivalent performance between the Wagyu genotypes and the higher potential Angus sired groups. Differences due to growth treatment were non-significant except for IMF. However, the trends over all genotypes were mostly in favor of the fast growth groups. The interactions of growth treatment by genotype were not significant except for marble score in the second group. Inconsistent effects of treatments await clarification from future cohorts. The CMQ4 scores (eating quality) showed good agreement with higher marbling and IMF.

WILKINS, J.F., IRWIN, J., MCKIERNAN, W.A. and BARWICK, S.A. (2002). *Anim. Prod. Aust.* 24, 370.

Email: john.wilkins@agric.nsw.gov.au