TERMINAL SIRE INFLUENCES LAMB MEAT QUALITY

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Consistency of eating quality of lamb is an issue that the lamb industry is addressing through processing, management and genetic pathways. The effects of age, finishing conditions and level of Merino genetics in sheepmeat have been studied (Pethick *et al*. 2002). This paper examines some effects of terminal sires on objective measurements of eating quality of first-cross lambs.

Semen from 15 rams (8 Poll Dorsets, 5 White Suffolks, 1 Texel x Poll Dorset and 1 Texel x White Suffolk) was used to inseminate South Australian Merino ewes over 2 years. The sires had an average Carcase Plus Index (Lambplan) of 3 index standard deviations above the population mean. The lambs were curfewed for 24 h, transported to a commercial abattoir and slaughtered after overnight lairage. Carcasses were electrically stimulated (90 s, 1130 V peak, 2 A) within 60 minutes of slaughter. Temperature and pH (TPS pH meter WP-80) of the caudal end of the loin was measured immediately after stimulation and then at hourly intervals for 4 h, and again 24 h post stimulation. One loin was removed from each carcass and weighed. Loin tenderness was assessed as described by Hopkins and Thompson (2001), after aging at 4^{o}C for 5 days. Ultimate pH (pHu) and colour (L*, a*, b* - see Table 1; Minolta chromameter, CR-300) of the other loin between the 12th and 13th ribs were measured 26 h after slaughter. Rate of pH decline was estimated from an exponential decay equation using PROC NLIN (SAS; Hopkins and Thompson 2001). Significance of fixed effects was tested using GLM. Fixed effects in the model were year of birth, birth-rear type, sex, slaughter batch, and slaughter day nested within year and trimming category (nil, low, moderate and major). Hot carcass weight was used as a covariate when effects on loin weight were analysed. Whether the pH was less than 6.0 at 10^{o}C (pH-temp window) was fitted as a fixed effect when pHu, pH decline and tenderness were modelled.

Table 1. Number of records (N), unadjusted means, standard deviation (s.d.), coefficient of variation (c.v.) and level of significance of fixed effects for selected carcass and meat quality traits (see text for details).

Trait	N	Mean	s.d.	c.v. (%)	Sire	Sex	Batch	Trim
Loin weight (g)	1196	577.7	90.3	15.6	***	***	**	***
Lightness (L*)	1196	33.4	2.71	8.1	***	***	n.s.	**
Brightness (a*)	1196	17.4	1.63	9.4	***	***	***	**
Redness (b*)	1196	7.1	1.01	14.2	***	n.s.	**	*
Ultimate pH	1195	5.69	0.106	1.9	***	n.s.	***	n.s.
Rate of pH decline	1184	0.29	0.218	74.9	**	n.s.	*	n.s.
Tenderness (kg/F)	1184	2.84	0.812	28.6	***	**	**	***

* 0.05<P<0.01; ** 0.01<P<0.001; ***P<0.001

The number of records, mean values of carcass and meat quality measurements, their deviations and coefficients of variation are shown in Table 1. Sire and slaughter day had a significant effect on loin weight and all meat quality measurements, but birth-rearing type was only significant for loin weight. The effect of sex, slaughter batch and trim level had a significant effect on only some of the traits (Table 1). The pH-temp window had a significant effect on pHu, pH decline and tenderness. These results indicate that both genetic and phenotypic variation exists with all of the traits measured.

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