THE EFFECT OF EYE MUSCLE DEPTH BREEDING VALUES ON LAMB DRESSING PERCENTAGE.

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Introduction

Recent genetic gains have improved commercial lamb processing efficiencies by increasing carcass weights while at the same time decreasing carcass fat depth (GR). Selection for eye muscle has been shown to increase boning room yield (McLeod *et al.* 2007) justifying the improvement in this trait over recent years in Australia. The influence this has on dressing percentage will be further investigated. Dressing percentage is calculated from the ratio of hot carcass weight to pre-slaughter liveweight. The higher this ratio, the larger the economic gain achieved from each lamb. Many environmental and genetic factors influence dressing percentage. Dressing percentage is a moderately heritable trait (Safari & Fogarty, 2003), however, Australian sheep breeding values (ASBV's) are not commercially provided for dressing percentage to the Australian lamb industry as it is an expensive trait to measure. Perry and McKiernan (1994) showed that well muscled Angus steers had a higher dressing percentage than average muscled steers. Fogarty *et al.* (2003) documented a significant effect on dressing percentage between different strains of Merinos, however, dressing percentage had a poor correlation with carcass eye muscle depth (PEMD) in Merinos (Safari & Fogarty, 2003). LAMBPLAN Australian Sheep Breeding Values (ASBV's) for growth (PWWT), fat depth (PFAT) and muscling (post weaning eye muscle depth - PEMD) are potential tools for producers to improve the conformance to market specifications. The aim of this study was to determine if selecting terminal sires for eye muscle depth influenced the dressing percentage of their progeny. The association of dressing percentage with lamb growth rate and fatness was also investigated.

Materials and methods

367 1st cross (Border Leicester X Merino) ewes were randomly allocated into two joining groups after being stratified on weight and carcass fat depth (GR). Poll Dorset sires were selected for high and low muscle (PEMD) but were similar for growth (PWWT) and fat depth (PFAT). Table 1 represents the average ASBV's for each sire group.

Table 1 Average ASBV'S for each sire group

Group	Growth PWWT	Fat PFAT	Muscle PEMD
High muscle	9.32	-0.682	1.173
Low muscle	8.43	-0.772	-1.085

The progeny, 400 second cross lambs, were used to provide the data for this study. Joining occurred over seven weeks, then the joining groups were amalgamated until lambing commenced on the 19th April 2005. The ewes were weighed and fat scored prejoining, postjoining, at scanning, marking and weaning. All the ewes and lambs were run together from marking to weaning. Lambs were assessed for liveweight and estimated fat depth (GR), with a four hour feed and water curfew. Live assessments were then conducted every 14 days until slaughter. Lambs were curfewed overnight for 15 hours prior to transporting to abattoirs, then given access to water for 15 hours prior to slaughter. The lambs were slaughtered using serial kills as they met market specification, from the 15th September 2005 until 1st December 2005, at a minimum 43.5kg liveweight. To reduce selection bias between each serial slaughter a minimum of 40% of lambs were selected from either muscle group. Information collected on lambs included radio frequency identification (RFID) ear tag number, carcass body number, hot standard carcass weight (Ausmeat trim), carcass fat depth (GR) and carcass length.

Statistical analysis

The results were analysed using the statistical package ASReml (Gilmour *et al.* 2002), which fits linear mixed models. The fixed terms in the model included carcass fat, muscle group, slaughter group and also their interactions. The aim of the analysis was to determine whether there was any significant difference in dressing percentage between the progeny from the high and low EMD sires when their weights were adjusted to a

constant fat depth. The growth rate of each animal over the two weeks prior to slaughter was examined for any trend between growth and dressing percentage.

Results and discussion

There was a small difference in dressing percentage in favour of the high EMD sired progeny in the first slaughter but this difference was not evident at later slaughter dates (Figure 1). In fact this difference was reversed in the third slaughter. The overall difference between dressing percentage was not significant (P=0.442) when analysed across all kill dates.

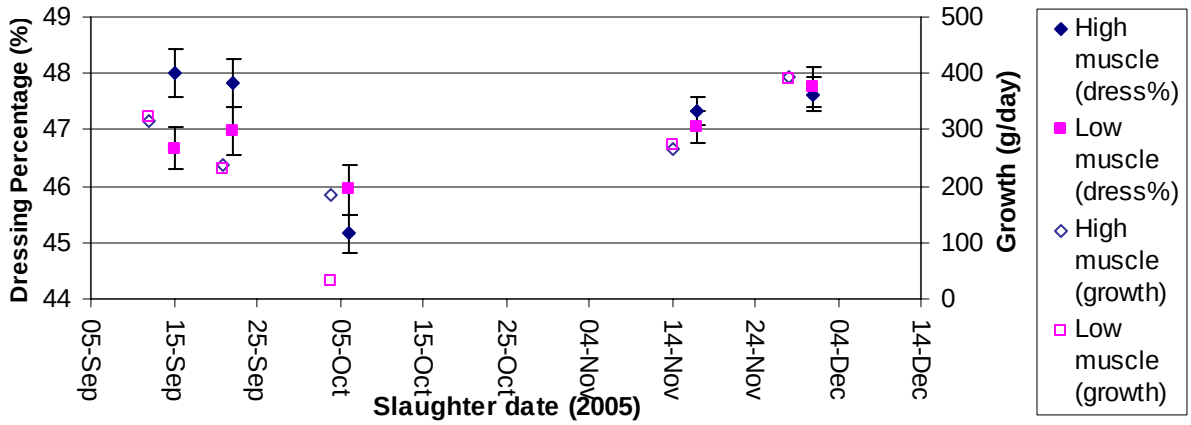

Figure 1: Dressing percentage for progeny from high and low EMD sires (with weights adjusted to a constant fat depth) and their growth rate prior to slaughter.

There is evidence to suggest from figure 1 that higher growth rates of the lambs prior to slaughter correspond to higher dressing percentages. In this study lamb growth rates declined after the second slaughter due to an outbreak of chlamydial arthritis.

Table 2: GR Carcase fat depth (mm) for high and low muscle groups (error in brackets) at each slaughter

	15/09/2005	22/09/2005	6/10/2005	17/11/2005	1/12/2005
High muscle group	12.72 (0.75)	11.21 (0.73)	9.10x (0.58)	10.56 (0.44)	12.63(0.50)
Low muscle group	11.00 (0.63)	9.75 (0.71)	9.17 (0.75)	10.84 (0.48)	11.72 (0.59)

A similar pattern to dressing percentage existed across the slaughters for carcase fat (Table 2). The high muscle group progeny were fatter in the faster growing, younger lambs slaughtered earlier. This difference disappeared in the later slaughters.

Conclusion

There are many factors that influence dressing percentage. The positive relationship between carcase fat and dressing percentage was confirmed by this study and should be accounted for when assessing lambs for slaughter. There did not appear to be a strong relationship between EMD and dressing percentage in these terminal sired lambs. The difference in dressing percentage appears to be confounded by changes in lamb growth rate prior to slaughter.

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