Quantitative and qualitative characteristics of the loin of grazing lambs from different production systems

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Introduction The international sheep market is supplied mainly from New Zealand and Australia, where there are advanced production systems and marketing organisations, and where the product is exported mainly in the form of carcasses and cuts. In Brazil, the farmers should aim to produce a younger animal, with an adequate fat level at an optimum stage of muscle development, in order to gain market share The proportions of muscle, bone and fat largely determine the value of the carcass, and the breed and age of animal, in addition to other factors such as feeding systems, cause variation in the proportions (Purchas *et al*., 1991). Grazing systems may be considered in Brazil due to reduced production costs. Measuring *M. longissimus* (the loin muscle) traits is a way of evaluating carcass quality because this muscle is one of the most important commercial cuts and represents total carcass characteristics. The objective of this study was to determine qualitative and quantitative characteristics of the loin of lambs on different production systems.

Materials and methods The experiment was carried out at the Experimental Research Station of UFPR, Pinhais, PR, Brazil, in a randomised block design with three replications. Four Suffolk lambs/plot grazed bermuda grass (*Cynodon dactylon* hybrid Tifton 85) in three production systems during the summer season: (1) lambs weaned at 60 d of age and grazed until slaughter; (2) lambs with their mothers until slaughter; (3) the same as Treatment 2, but the lambs were supplemented by a creep feed each day at 1% of live weight with a concentrate (18% crude protein and 80% TDN). Male lambs were weighed each 14 d and slaughtered at 33-34 kg live weight. After slaughter, carcasses were cleaned and eviscerated. They were then cooled at 5ºC for 24 h and the left side was sectioned into: shoulder, neck, ribs, loin (*M. longissimus)* and leg. *M. longissimus* weight was recorded and its dressing-out (%) calculated. Linear loin measurements were made: A or loin maximum width (cm); B or loin maximum depth (cm); C, loin subcutaneous fat thickness (mm) and J, loin maximum fat thickness (mm). Statistical analysis was conducted using a generalised linear model procedure.

Results and discussion Genetics may be the main factor that affects carcass and cut characteristics (Purchas *et al.,* 1991). In this experiment, all animals were from the Suffolk breed and were slaughtered at similar live weights (33-34 kg LW), but with different ages. Treatment (1) lambs were slaughtered at 134 d of age; treatment (2) and (3) lambs were slaughtered at 105 d and 100 d, respectively. Lambs weaned and kept on pasture until slaughter had lighter loin (0.552 kg; $P<0.05$) compared to lambs receiving creep feed (0.719 kg) and unweaned lambs (0.680 kg); the latter two treatments did not differ significantly. All treatments had similar loin dressing-out percentages. Loin maximum width (A) and depth (B) showed similar results ($P>0.05$). The fat thickness assessments (C and J- mm) represent the depth of subcutaneous fat. Weaned lambs gave the lowest average for C and J (Table 1) compared to lambs from Treatment (2) and (3), that did not differ significantly from one another. The production systems did not give the subcutaneous fat depth and slaughter ages required by the Brazilian market, although the lambs kept with their dams gave more acceptable fat thickness (J=1.78 mm).

Conclusions Sheep production systems on summer pastures with lambs slaughtered at around 100 to 134 days of age and slaughter weight 33-34 kg did not reach the subcutaneous fat depth required by the Brazilian market.

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Table 1 Average values of loin characters of lambs produced in different systems

Treatments	1	2	3
Loin weight(kg)	0.547a*	0.720b	0.680b
Loin dressing-out (%)	9.24a	9.63a	9.82a
Loin linear measurements			
A (cm)	4.90a	4.15a	5.25a
B (cm)	2.30a	3.26a	2.78a
C (cm)	0.44a	0.77b	0.98b
J (cm)	0.56a	1.21b	1.78b

Different letters in rows represent statistically significant differences (P<.,05) by Tukey test.

Reference

Purchas, R.W., A.S. Davies & A.Y. Abdullah (1991). An objective measure of muscularity: changes with animal growth and differences between genetic lines of Southdown sheep. *Meat Science*, 30, 81-94.