Performance, carcass characteristics and meat quality of grazing lambs finished on tropical grasses

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Introduction

Brazil is a country of continental size, and more than seven million ha are occupied with tropical pasture. Worldwide animal production from tropical pastures is also very significant where *Cynodon*, *Panicum* and *Paspalum* are important genus. These grasses are widely used in the production of cattle, and are growing in importance for sheep production, but their potential for producing quality lamb is not fully known.

The objective of this study was to evaluate the potential of two tropical grasses for finishing lambs in autumn to reduce the seasonality of production of lamb for meat.

Methods

The study was carried out at State Foundation for Agricultural Research (FEPAGRO - Unit Viamão) - in the Southern Region of Brazil, in an area of 1.2 ha. A split plot within a randomized block design was used with three replications. The main plot was composed of two tropical grasses with different growth habits: *Cynodon* spp. cv Tifton-85 and Aruana grass (*Panicum maximum* cv. IZ-5). The split plot consisted of two sheep breeds (Texel and Corriedale). The following assessments were performed: herb-age mass, forage quality (Euclides *et al.* 1982), productive performance through animal average daily weight gain (ADG), carcass characteristics: hot weight (CHW), hot carcass yield (HCY), cold carcass weight (CCW), cold carcass yield (CCY), cooling loss ratio (CLR), fat thickness and conformation, and meat quality by the profile fatty acids according to the methodology of Bligh and Dyer (1959). The data were analyzed using analysis of variance and the means were compared with Tukey test at 5% probability. The repeated measures (different periods) were analyzed using the "Proc Mixed" in SAS® statistical software version 9.3 (Statistical Analysis System, Cary, North Carolina).

Results

Considering the whole experimental period, there was, on average, no difference between treatments or between breeds for ADG. For the different assessment periods, there was also no difference between breeds, but there was significant difference between treatments (Fig. 1). In the first and fourth periods, the ADGs were similar between treatments. In the second period, the animals had higher ADG in the Tifton-85 treatment, and in the third period Aruana grass provided higher ADG. The differences between treatments over the periods can be explained largely by the variation in leaf:stem ratio of pastures, which ranged from 0.06 to 2.41 in Aruana and 0.28 to 1.12 in Tifton 85. The smaller variation in leaf:stem ratio of Tifton-85 explained the steadier gains throughout the experimental period.

For all carcass traits there was no difference between treatments (Table 1). Comparing breeds, Texel lambs were superior for liveweight at slaughter (LS), HWC, HCY, conformation, CCW and CCY. For fatness score there was no difference between the breeds. These differences in most

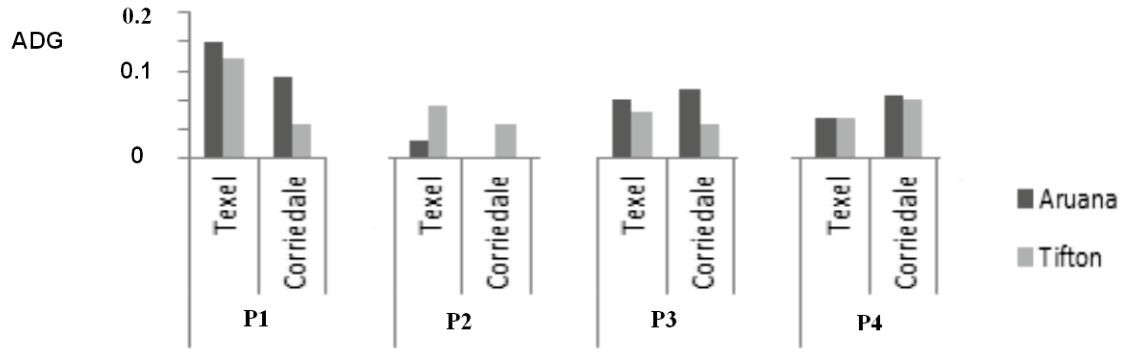

Figure 1. Average daily gain (ADG) (kg/day) throughout different experimental periods (P).

Table 1. Carcass characteristics of lamb breeds finished on Aruana and Tifton-85 grasses.

Carcass Characteristics[1]	Aruana Grass		Tifton-85	
	Corriedale	Texel	Corriedale	Texel
LS (kg)	30.91a	39.66b	30a	39.77b
HCW (kg)	12.48a	18.31b	12.1a	17.66b
HCY (%)	40.27a	46.05b	40a	44.31b
Fatness score	2.33a	2.66a	2.2a	2.44a
Conformation	1.83a	3.22b	1.6a	3.33b
PCF (kg)	12.11a	17.84b	11.68a	17.27b
RCF (%)	39.04a	44.84b	38.57a	43.32b

[1]LS - Liveweight at slaughter; HCW – hot carcass weight; HCY - hot carcass yield; Fatness Score (from 1(without fat) to 5 (high fat)); carcass conformation score (from 1- sub-concave to 5 - convex) CCW – cold carcass weight; CCY - cold carcass yield.
*Means followed by different letters, differ the breeds by Tukey test (P<0.05), within each pasture species.

carcass traits can be explained by the distinct productive potential of the breeds used. Texel is a breed selected for meat production and Corriedale is a double purpose breed (wool and meat).

The most frequent fatty acids found in the meat were the saturated palmitic acid (C16) and stearic (C18) acids; mono-unsaturated heptadecanoic (C17: 1) and oleic (C18: 1), as well as polyunsaturated linoleic (C18: 2ω9 cis, trans) and linolenic (C18: 3ω3) acids. Fatty acids that were most prevalent in the meat were oleic (37.07%), palmitic (26.93%) and stearic (14.21%). These represented 78.21% of total fatty acids found. There were differences in the fatty acid profile between treatments. Oleic acid (C18: 1ωcis/trans) was found at higher levels in meat from lambs finished on Aruana grass. Arachidic acid showed up in greater quantities in meat from lambs finished on Tifton-85. There was no difference in lipid profile between breeds evaluated. No differences were found between treatments or between breeds and for the relations poly-unsaturated/saturated fatty acids (PS) and omega-6:omega3 (ω6:ω3). The relationship between PS for both treatments was 0.09. This relationship confirms the high proportion of saturated and low polyunsaturated fatty acid characteristics of sheep meat. The high amount of dietary fiber influences this ratio, as fiber increases rumen biohydrogenation, which consequently leads to greater production of saturated fatty acids. The relationship between ω6:ω3 was 0.2 for Aruana and 0.46 for Tifton-85 grass. The low ratio found can be explained by animal nutrition. Diets using only grazing are characterized by an elevation of ω3 fatty acids and reduction of ω6.

Conclusion

The data of animal performance, carcass characteristics and meat quality obtained in this study show that, if the tropical grasses are well managed, they have good potential for finishing lambs for slaughter in the autumn, reducing the seasonality of production. Although there are important differences between lamb breeds, Corriedale and Texel can be finished exclusively on tropical pasture. There are some differences in meat fatty acid profiles due to the pasture species that needs to be better assessed

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