Lamb meat quality from native grasslands of the Brazilian Pampa biome

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Consumers are increasingly interested in getting quality meat from sustainable agricultural practices. In the southern region of Brazil, lamb meat production is characterized almost exclusively by production in pastoral systems, and the majority is present in the Pampa biome, one of the richest biomes in terms of biodiversity in the world. This vegetation contains representatives of several plant species that are important source of antioxidants, with emphasis on *Desmodium incanum* (DI), a native legume with great amounts of condensed tannins and α-tocopherol (vitamin E). Our study investigated how different finishing systems and contrasting proportions of native legumes (mainly DI) in the diet affect lamb meat quality. Twenty-four castrated male Texel lambs of approximately 145 days old and initial live weight of 28.36 ± 1.37 kg were randomly assigned to three feeding treatments: 1) native grassland of Pampa biome with low proportion of legumes (LL, 4.37%); 2) the same grassland, but with high proportion of legumes (HL, 14.01%); 3) stall-fed system (SF) where the animals were fed with a low tannin and tocopherol concentration diet, and the lambs had a similar growth rates as the grazing groups. After 82 days of exposure to dietary treatments, all animals were slaughtered with 34.46 ± 1.33 kg, and the *Longissimus thoracis et lumborum* muscle was collected, vacuum packed, and stored at -30°C. Dietary treatments did not affect final pH, rib eye area, color descriptors, shear force, protein and lipid composition, γ-tocopherol deposition, and muscle cholesterol content ($P > 0.05$). Cold carcass yield from SF lambs was higher than HL. The meat from pasture-fed animals had greater water holding capacity, higher deposition of muscle α-tocopherol, and lower lipid oxidation (TBARS values) after 9 days of storage ($P < 0.05$). Low-legume lambs had the lowest cooking loss and highest subcutaneous fat thickness, which promoted better sensory quality of the meat (tender, juicier, and with a more intense flavor), as assessed by a trained panel. Pasture-based diets enhanced odd- and branched-chain fatty acids (OBCFA), trans vaccenic acid and total conjugated linoleic acid (CLA), and decreased elaidic acid ($P < 0.05$). Despite the lower Δ9-desaturase activity, the higher proportion of DI in the HL diet did not impact on meat nutritional quality. Finishing lambs on Pampa grasslands is an option for improving the oxidative stability and beneficial fatty acids content of meat, which enhance product quality and human consumer health. Preserving these pastures can improve the meat quality and generate a sustainable exploitation of native environment.

Keywords: antioxidants, tannin, tocopherol, *Desmodium incanum*, *Paspalum notatum*, plant secondary compounds.

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