

Effect of slaughter weight and beef cut on the tenderness of 'Cachena' meat

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Despite recent recommendations towards a reduction, the moderate consumption of meat is desirable due to its high biological value protein content, containing all essential amino acids in adequate proportions. The consumer usually considers three attributes when buying meat: appearance, colour and presumed tenderness considering the meat cut. After purchase, the most important attribute is tenderness.

The aim of this study was to assess the effect of slaughter weight and beef cut on 'Cachena' meat tenderness. Texture was evaluated by texture profile analysis (TPA) and Warner-Bratzler shear force (WB) of the muscles *Longissimus dorsi* (LD) and *Psoas major* (GP) of two groups of animals. The first group (light animals) consisted of 16 animals with live weights between 142-225 kg, and the second group (heavy animals) with 16 animals with live weights that between 272-335 kg. Sensory attributes were assessed by a trained panel of tasters through a quantitative descriptive analysis of the LD muscle. The animals were reared on a farm in Barrancos and were slaughtered at the Beja slaughterhouse. Meat cuts were kept at 2°C and analysed 72h after slaughter. Results were analysed with Statistica v.12 software using ANOVA and Tukey's HSD test ($P < 0.05$).

Slaughter weight and meat cut influence meat tenderness. There are differences ($P < 0.05$) in meat hardness between animal groups, the meat of light animals being more tender than that of heavy animals ($11.12N \pm 4.57$ and $15.17N \pm 7.22$, respectively). However, according to WB, the LD shows higher shear forces compared to the GP muscle ($27.82N \pm 10.48$ and $25.58N \pm 5.37$, respectively), which may be related to the fact that light animals have more connective tissue.

Regarding meat cuts, LD ($15.70N \pm 7.83$) is harder than GP meat ($10.92N \pm 3.21$). The same was observed for chewiness, with more energy needed to chew LD ($5.95J \pm 3.50$) compared to GP meat ($3.99J \pm 1.64$). These results agree with those from WB, because it is necessary to apply greater shear forces to LD than to GP meat ($27.82N \pm 10.48$ and $25.58N \pm 5.37$, respectively).

Concerning sensory analysis, the tasters consider heavy animals to have tender meat ($P < 0.05$), which agrees with WB results. Therefore, sensory evaluation is better correlated with the meat's WB than with the force necessary for compression (hardness) or the energy needed for chewing (chewiness).

Further studies are being undertaken considering higher slaughter weights and less noble beef cuts.

Keywords: Texture profile analysis (TPA), Warner-Bratzler shear force (WB), *Longissimus dorsi* (LD), *Psoas major* (GP), Meat tenderness, Beef cuts