The effect of weaning age and slaughter age on the sensory characteristic of Arouquesa Beef - a Protected Designation of Origin Portuguese meat

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Introduction: Arouquesa is an autochthonous Portuguese breed whose animals are rustic and produced under traditional agriculture systems. These animals were uses for their force in agriculture work and its meat. The production region has moderate summer temperatures and an abundance of water until the end of spring, allowing its grazing almost all the year (CAP/DGAV, 2021). Animals are slaughtered between 9 months and one year. Once there is no commercial interest in the milk, animals are breastfed for an extended period. The feeding includes pasturage and cereal-based feed. Beyond the slaughter age, the weaning age has potential effects on the characteristics of the meat (Blanco et al., 2008). This work aimed to evaluate the effect of weaning and slaughter age on the sensory characteristics of Arouquesa meat assessed by a Check All That Apply (CATA) test made with consumers.

Material and methods: Animals were followed at the farm of several producers and assigned to 4 groups, with combinations of weaning (W) at 9 or 5 months and slaughter (S) at 9 or 12 months: W9-S9, W9-S12, W5-S9, and W5-S12. After slaughter, the Longissimus thoracis muscle was collected. A total of 26 samples were tested (7 W9-S9, 5 W9-S12, 6 W5-S9, and 8 W5-S12).

Steaks (1.5 cm) were cut and cooked in plastic bags in a water bath (72ºC). Pieces of 2x2 cm were cut from the cooked steak. Two pieces were rolled up in aluminum foil and kept at 60ºC until served.

Seventy consumers performed the CATA test. The technical conditions of the test were similar to those previously described (Silva et al., 2020). It was asked to the consumers to evaluate the general appreciation of each sample in a 9-point hedonic scale and to mark in a list of 22 attributes those they considered to apply: AROMA - cooked meat/beef broth; Cooked fat (pleasant); FLAVOR - cooked meat/beef broth; cooked fat (pleasant); sweet; bitter; sour; bloody; liver; hay; grass/vegetal; cardboard; fish; TEXTURE - tender; very tender; tough; very tough; fibrous; juicy; dry; disintegrate quickly in the mouth; takes time to chew. The vocabulary was adapted from the AMSA (Wheeler et al., 2015). The Cochran's Q test was used to compare binary data from the CATA test. Attributes and samples were analyzed by principal coordinate analysis (PCA), and penalty analysis. Data analysis was performed with XLStat, Addinsoft, Paris).

Results: Out of the 22 attributes, 8 presented differences ($p<0.05$) between the groups, namely the meat broth and fat smell, sweet flavor, tender and very tender, very tough, juiciness, and ease of disintegration in the mouth. Meat from the group W9S9 and W5S12 had higher smell notes. The PCA results showed that the texture parameters were the main responsible for the discrimination of the samples, with tenderness, juiciness, and ease to disintegrate in the mouth in one side of the plan, and tough, fibrous, dry, and time to chew in the opposite side. The attributes of aroma were fairly discriminant. Samples W9S9 and W9S12 were associated with more tender and juicy characteristics. Meat from animals weaned at five months was on the plan's opposite side (tougher and drier).

In the same sense, the penalty analysis revealed that tender, juicy, and easy to chew meat had a significative ($p<0.001$) gain in the hedonic evaluation (0.97, 1.74, 1.68, respectively). The time to chew was responsible for the highest penalty (-1.42) in the hedonic mean.

Conclusion: The weaning and slaughter age of the Arouquesa animals results in statistically different sensory characteristics, still with similarities between the four studied groups. Generally, it is possible to conclude that Longissimus thoracis meat from cattle raised under more traditional conditions, with later weaning, is more tender, juicy, and sweet.

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