

Influence of chestnuts in the finishing diet of Celta pig breed on the free amino acids

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Objectives: This research designed to study the effect of chestnut finishing diet on the free amino acid (FAA) composition of the

Longissimus thoracis et lumborum muscle of the Celta pig raised in a semi-extensive system.

Materials and Methods: To achieve this objective, 18 pigs of Celta breed were used which were divided into two random groups of 9 animals each. Thus, one of the groups was fed exclusively with chestnuts, while the other was nurtured with a commercial feed. Said feeding was supplied during the last 3 months prior to the pig slaughter. Once the animals have been slaughtered, the *Longissimus thoracis et lumborum* muscle was removed from the left half carcass of each animal. The FAA were determined according to (Pérez-Palacios et al., 2010) following the modifications proposed by (Lorenzo et al., 2015) where the amino acid extract obtained was derivatized and analyzed by RP-HPLC using a multiple fluorescence detector. In addition, the results obtained was evaluated using a one-way ANOVA.

Results and Discussion: The outcomes attained in this work displayed that feeding chestnuts did not significantly ($P > 0.05$) influence the total amount of FAA in the *Longissimus thoracis et lumborum* muscle, since the concentration determined in both groups was comparable. Similarly, the FAA that were found in greater quantity (arginine, followed by threonine and alanine, for both feedings) did not show significant ($P > 0.05$) differences in their concentrations with respect to the diet. However, other amino acids determined in a smaller proportion were significantly ($P < 0.05$) influenced by chestnut inclusion. Thus, 7 of the 18 FAA identified were found to be affected by diet. Specifically, the chestnuts supply significant ($P < 0.05$) decreased the amounts of affected FAA. This fact could influence the sensory quality of meat, since amino acids are not only essential components of proteins, but also represent important substances for the specific flavor and taste of meat (Lee et al., 2016). For example, previous studies have reported that several FAA are part of the flavor components of pork (Ma et al., 2020). In the case of our research, the presence of a significant higher amount of the FAA isoleucine, leucine, methionine, phenylalanine, and valine, in the muscle of fed commercial feed pigs could favor their bitter taste, since these amino acids have been characterized with said taste. On the other hand, serine has been identified as an amino acid with a sweet taste. This contrasts with previous knowledge that usually associates meats fed with chestnuts with sweeter flavors than their counterparts fed with commercial feed. Nevertheless, other FAA that have not been significantly ($P > 0.05$) affected by diet are also related to sweetness, such as serine, glutamic acid, threonine, alanine, and lysine, some of which were found in higher concentrations in chestnut pigs. Finally, it is worth mentioning glutamic acid, as it is a considerable pork flavor (Shahidi, 2001), since in addition to being related to the sweet taste it is also related to the sour taste. Additionally, the fresh taste of meat is a characteristic attributed to this last amino acid (Ma et al., 2020).

Conclusions: The inclusion of chestnuts in the finishing diet of Celta pigs decreased the concentration of 7 FAA, which could be involved in different ways in the taste and flavour of the meat obtained.

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Key words: Celta pig, *Longissimus thoracis et lumborum*, Free amino acids (FAA), Taste, Flavour