

## Effect of the use of chestnuts in the finishing diet of Celta pig on the free fatty acid profile

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**Introduction:** Currently, the population is increasingly interested in the consumption of meat products that respect the environment and animal welfare (Sosnicki and Newman 2010). In this regard, extensive breeding and the use of natural resources such as chestnuts acquire special interest in the production of the Celta pig, an autochthonous breed of Galicia (Northwest Spain). However, the use of chestnuts in the finishing diet of pigs could modify different characteristics of the meat and meat products (Bermúdez et al. 2012; Domínguez et al. 2015), which could affect the final perception of the consumer. This is the case of free fatty acids, which can affect the flavor and taste of meat (Flores 2018). Therefore, the effect of chestnut on the free fatty acid profile of the Longissimus dorsi muscle of the Celta pig has been studied.

**Material and methods:** For this work, 18 pigs divided into two equal groups were fed in extensive regime with chestnut and commercial feed during the finishing diet (the last 3 months). After slaughter of the pigs, the left Longissimus dorsi muscle was extracted from each carcass for later analysis. The free fatty acid profile was determined by separation through NH<sub>2</sub>-aminopropyl SPE column (Kaluzny et al. 1985), and transesterified with sodium methoxide and sulfuric acid-methanol solutions following the procedure described by Barros et al. (2020). Then, the free fatty acids were identified and quantified using a gas chromatograph (GC) with a flame ionization detector (FID) employing the chromatographic conditions reported initially by the same authors. The influence of finishing diet on free fatty acids profile was evaluated using a one-way ANOVA with the IBM SPSS Statistics 23.0 software package (IBM, Chicago, IL, USA).

**Results:** A total of 36 free fatty acids were detected in the Longissimus dorsi muscle of the pigs from both feedings. The statistical analysis displayed that the chestnut diet did not affect the free fatty acid profile, since no individual free fatty acid was significantly ( $P > 0.05$ ) influenced by the diet supplied. Even the majority fatty acid was the same for the two diets, this being the oleic acid (C18:1n9c). In the same way, finishing diet did not significantly affect ( $P > 0.05$ ) the total amounts of SFA, UFA, MUFA, and PUFA or PUFA/SFA ratio. These facts are similar to those previously reported by Gómez et al. (2017), who observed that the use of chestnuts in the finishing diet of Celta pig had a minimal influence on the content of free fatty acids in the ripening and storage of Galician "Chorizo", at the same time that they also determined that oleic acid was the most abundant free fatty acid.

**Conclusions:** The inclusion of chestnut in the finishing diet of Celta pigs did not appear to affect the individual free fatty acids, nor the total amounts of SFA, UFA, MUFA and PUFA, nor the PUFA/SFA ratio. In this way, it is evidenced that both the meat of the pigs fed with chestnut and the meat of commercial feed pigs have similar states of lipolysis, so that the possible differences in taste and aroma due to these compounds could be minimal.

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