

Effect of slaughter age in intramuscular fat content and fatty acid profile of grazing Cabra Galega lambs

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Objectives: Sustainable meat production is major topic of interest to advance towards more sustainable production systems and meet the increasing demand for meat produced from system with sustainable actions, especially with the valorization of autochthonous breeds. It is also important that align this advances with the preservation of meat nutritional value [1]. The study aimed to evaluate the effect of slaughter age of autochthonous lambs (*Cabra Gallega*) grazed in the mountains of Galicia (Spain).

Materials and Methods: A total of 57 *Cabra Gallega* lambs (19 animals per group, initial weight) were slaughtered after 60, 90, and 120 days (weight at slaughter of 12.8, 15.9, and 16.8 kg, respectively). The animals were slaughtered after 12 h of fasting in a commercial slaughter facility following the EU regulation no. 1099/2009. After 24 h at 4 °C, *Longissimus thoracis et lumborum* muscle was removed and samples were acquired. Intramuscular fat content was determined following the AOCS Official Procedure Am 5-04 [2]. Fatty acid profile was determined using gas chromatography coupled with mass spectrometry [3]. Data were examined using a one-way ANOVA analysis. Duncan's test was used for the determination of the differences between least squares means ($P < 0.05$).

Results and Discussion: Age of slaughter did not affect the fat content (1.22, 0.44, and 0.94 g/100 g for 60, 90, and 120 days, respectively) of lamb meat. Fatty acid profile was affected by the slaughter age. The main groups of fatty acids were saturated fatty acids (SFA) and monounsaturated fatty acids (MUFA), followed by polyunsaturated fatty acids (PUFA) (37-41, 38, and 21-25% of total area, respectively). The age of slaughter affected only SFA ($P < 0.05$) where a gradual reduction was observed as the age of animals increased (from 41% at 60 days to 37% at 120 days). The main fatty acids were oleic acid (C18:1n9), palmitic acid (C16:0) and stearic acid (C18:0), regardless of age (30, 20, and 12%, respectively). Among SFA, the main fatty acids were C16:0, C18:0, and myristic acid (C14:0). In the case of MUFA, the main fatty acid was C18:1n9 followed *cis*-10-pentadecenoic acid (C15:1n5; 4%). In the group of PUFA, linoleic acid (C18:2n-6), arachidonic acid C20:4n-6, and docosapentaenoic acid (22:5n-3), which account for 7, 6 and 3%, respectively. These individual fatty acids were not significantly affected by animal age at slaughter. No significant effects were observed for the sums of n-3 or n-6 fatty acids. However, a significant effect was observed in relation to n-6/n-3 ratio that increased ($P < 0.01$) in the meat of animals slaughter at 120 days (2.9%) in relation animals at 60 and 90 days (1.8 and 1.9 for 60 and 90, respectively). This reduction in SFA content and increase in n-6/n-3 ratio with increasing slaughter age (42 or 70 days) were reported in Altamurana and Trimeticcio lambs [4].

Conclusions: The age of slaughter is an important factor to consider for grazed *Cabra Gallega* lambs. Although no effect was observed in intramuscular content, slaughtering lambs with 120 days favors fat quality by reducing SFA and increasing in n-6/n-3 ratio. **Acknowledgements:** The authors are grateful to INIA (grant number: RTA2017-00081-C04) for financial support for the study. Authors are members of the HealthyMeat network, funded by CYTED (ref. 119RT0568). Thanks to GAIN (Axencia Galega de Innovación) for supporting this research (grant number IN607A2019/01). Paulo E. S. Munekata acknowledges postdoctoral fellowship support from the Ministry of Science and Innovation (MCIN, Spain) "Juan de la Cierva" program (IJC2020-043358-I).

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