

Fatty acids composition of meat of corriedale lamb and its crossing with merino dohne lamb, reared exclusively on pasture in uruguay

Juan Jose Lucas¹, Maria Cristina Cabrera², Ali Saadoun²

¹ Estacion Experimental Bernardo Rosengurt (EEBR). Depto. Producción Animal y Pasturas, Facultad de Agronomía, Udelar, Melo, Uruguay

² Depto. Producción Animal y Pasturas, Facultad de Agronomía, Udelar. Avenida Garzón 809. Montevideo, Uruguay

Introduction: In Uruguay, crossings between Corriedale breed (C) and Merino Dohne breed (MD) seek to improve productive parameters, such as prolificacy, disease resistance, and wool quality parameters, the latter mainly through the reduction of wool fiber diameter. However, this objective must not be achieved at the expense of a deterioration in the nutritional quality of the meat, a rich source of high quality protein, minerals, vitamins, and fatty acids. Fatty acids are important considering their implication regarding human cardiovascular diseases (Chen y Liu, 2020). Thereby, the present investigation was focused on the comparative study of fatty acid composition of meat of C breed and its crossing with MD.

Materials and methods: Lambs from C (4/4 Corriedale), MD 1/4 (3/4 C - 1/4 Merino Dohne) and MD 3/4 (1/4 C - 3/4 Merino Dohne) lambs were used. They showed a live body weight not significantly different (Kg) Animals (n=8 for each genotype) were randomly assigned to three blocks by breed, and reared on pasture. The experiment was approved by the ethical committee of the University Udelar (Uruguay) under CHEA number 963.

Meat samples from Longissimus thoracis muscle (250 g) were extracted and conserved under vacuum at -20 °C until analysis. Lipids were extracted by Folch procedure (Folch et al, 1957). Fatty acids were determined using a Perkin Elmer chromatograph Clarus 500 according to del Puerto et al. (2017). The one-way ANOVA analysis was used for the statistical comparison of the means.

Results: Although this was not the purpose of this research, it's important to note that the mean fibre diameters in the animals used here were 22.5, 20.4 and 19.7 μm for C, MD 1/4 and MD 3/4, respectively (data to be published). The differences between C and the two MD groups were significant ($P < 0.001$). Thus, the crossing between C and MD resulted in a reduced wool fibre diameter.

However, the three groups of animals do not present differences regarding the composition of fatty acids, except for the α -linolenic acid. In taht case, differences are significant only between C and MD 3/4 (1.29 %; 1.20 % and 1.11% of total detected fatty acids for C, MD 1/4 and MD 3/4, respectively. $P < 0.05$). Besides, fatty acids implicated against cardiovascular diseases, such as C18:1 and of course C18:2n6 and C18:3n3 and CLA presented a favourable high level in meat of the three breeds. (Dachev et al., 2021).

Conclusions: Although the mean fibre diameters were reduced when C lambs were crossed with MD lambs, the composition of fatty acids of meat sampled from the Longissimus thoracis muscle was not different between the threer breeds, except for the α -linolenic acid in one MD group. Furthermore, taken together, the level of fatty acids determined in the meat of the three breeds, could be considered as nutritionally relevant and interesting considering the health of consumers.

References:

- Chen, J. y Liu, H. (2020). Nutritional Indices for Assessing Fatty Acids: a Mini-Review. International Journal of Molecular Science, 21, 5695. doi:10.3390/ijms21165695
- Dachev, M.; Bryndová, J.; Jakubek, M.; Moucka, Z.; Urban, M. (2021). The Effects of Conjugated Linoleic Acids on Cancer. Processes, 9, 454. <https://doi.org/10.3390/pr9030454>
- Del Puerto M, Cabrera M, Saadoun A. (2017). A Note on Fatty Acids Profile of Meat from Broiler Chickens Supplemented with Inorganic or Organic Selenium. International Journal of Food Science, ID 7613069. <https://doi.org/10.1155/2017/7613069>
- Folch, J., Lees, M. and Sloane-Stanley, G. H. (1957). A simple method for isolation and purification of total lipides from animal tissues. Journal of Biological Chemistry, 226, 497-509.