INFLUENCE OF FEEDING COMPOSITION AND STORAGE TIME ON PHYSIC-CHEMICAL PARAMETERS OF CHURRA LAMB MEAT

P. E. S. Munekata[1*], R. Bermudez[1], M. Pateiro[1], R. Dominguez[1], A. Maggiolino[2], D. Franco[1], and J. M. Lorenzo[1],

[1]*Food Science and Technology, Centro Tecnológico de la Carne de Galicia, Ourense, Spain*,

[2]*Department of Veterinary Medicine, University of Bari Aldo Moro, Bari, Italy*,

*paulosichetti@ceteca.net

I. OBJECTIVES

The use of natural and residual sources from food processing in animal feeding is an important strategy to evolve the meat productive sector towards more sustainable practices and also reduce the environmental impact of food processing. Apple is an important source of nutrients, and heather (*Calluna vulgaris*) is a relevant source of bioactive compounds found in several countries of Europe. In this sense, the present study aimed to study the effect of apple, heather, and their combination and the storage time in the physic-chemical parameters of Churra lamb meat.

II. MATERIALS AND METHODS

The handling of animals was performed according to the Directive 2010/63/EU of the European Parliament and the Council of the European Union (2010). Sixty Churra male lambs (already weaned, 6 to 8 wk old) were used. The animals were separated in 5 groups according to diet composition: Control (14), Concentrate (12), Apple (12), Heather (11), or Heather + Apple (11). The water and feeding were offered *ad libitum*. The lambs were slaughtered at age 4 mo in a commercial abattoir (1.5 h transport) where they were stunned, exsanguinated (jugular vein), eviscerated, and skinned. The carcasses were chilled for 24 h at 4°C. The meat samples were collected from the *longissimus thoracis* muscle, vacuum packaged, and stored for 3, 9, and 15 d at 4°C. During the storage period, the meat samples were evaluated regarding the pH, color, thiobarbituric acid reactive substances, and texture. The influence of feeding composition and storage time on quality characteristics of Churra lamb meat were examined using analysis of variance, with IBM SPSS Statistics 23 software package (IBM Corp., Armonk, NY).

III. RESULTS

Regarding the pH, the lowest value ($P < 0.05$) was obtained from animals fed with Concentrate after 3 d of storage. This difference was not observed on other storage days wherein the pH values ranged from 5.61 to 5.74. In the case of L^*, not-significant differences were obtained from storage time and feeding composition. Differently, the a^* value increased during storage for all animals regardless of feeding composition. A similar outcome was obtained for b^* for animals fed with Control, Concentrate, and Heather + Apple. The storage time reduced the firmness, shear force, and total work of Churra lamb meat, particularly after 9 d of storage. The formation of lipid oxidation increased gradually ($P < 0.05$) during storage, but it was not affected by feeding composition.

IV. CONCLUSION

The inclusion of apple, heather, and their combination were associated with minimal effect on physic-chemical parameters of Churra lamb meat and could be used in its production.

Acknowledgments: This work was supported by European Research Area on Sustainable Animal Production Systems (SusAn, ERA-NETSUSAN 2016/48 [PCIN-2017-053], EcoLamb project). Thanks to GAIN (Axencia Galega de Innovación) for supporting this study (Grant Number IN607A2019/01). Paulo E. S. Munekata acknowledges postdoctoral fellowship support from the Ministry of Economy and Competitiveness (MINECO, Spain) “Juan de la Cierva” program (FJCI-2016-29486). José M. Lorenzo is a member of the HealthyMeat network, funded by CYTED (reference 119RT0568).

Keywords: apple, heather, lipid oxidation, meat quality, texture parameters