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Effects of Feeding Pecans on Carcass Characteristics, Color, Lipid Stability, and Nutritional Values of Lamb

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Objectives

Utilization of byproducts is an efficient strategy to decrease costs of feeding. During processing, pecans that show defects are usually discarded, generating a byproduct with high levels of oleic acid (C18:1n9). In this study, we evaluated the effects of feeding pecan byproducts on growth performance, meat quality attributes, and fatty acid profile of lamb.

Materials and Methods

Forty-four Santa Ines lambs (24 ram lambs and 20 ewe lambs) with approximately 20.77 ± 1.60 kg of body weight were randomly assigned to 1 of 4 dietary treatments (n = 11 per treatment). Diets were formulated with sorghum silage, broken rice, soybean meal, a commercial mineral mix, calcitic limestone, soybean oil, and 4 different levels of pecans: 0, 3, 6, and 9% (DM basis). All diets were isoenergetic. Lambs were fed for 52 d and after slaughtered, hot carcass weight was recorded, carcasses were chilled, and the M. *longissimus dorsi et lumborum* was excised from loins 24 h post mortem. Loin chops (2.5 cm) were cut and pH was assessed by using a Hanna® pH meter and objective color (L*, a*, b*) was recorded by using a CR-10 Konika Minolta color reader after 30 min of blooming at room temperature. Samples were evaluated for proximate composition, fatty acids profile, cooking loss, Warner-Bratzler Shear Force (WBSF), and lipid oxidation. Data were analyzed as a completely randomized design using the GLIMMIX procedure of SAS (SAS Inst. Inc., Cary, NC), whereas dietary treatment and gender was considered main effects.

Results

Inclusion of pecans in lamb diets did not affect moisture, protein, pH, cooking loss, lipid oxidation, and WBSF. Rams yielded heavier carcasses ($P < 0.01$), whereas fat percent in the lean was significant higher in meat from ewes. An interaction between the 2 fixed effects was onserved only for ash, whereas higher levels were detected in meat from rams fed control when compared to 9% pecan diets. Dietary treatments did not affect objective color parameters. However, meat from ewes were significant redder (a*) and yellower (b*) when compared to meat from rams. Greater levels of margaric (C17:1n7) and oleic (C18:1n9) acids were observed in the lean of ewes ($P = 0.03$ and 0.01, respectively), whereas meat from rams had greater values of linoleic acid (C18:2n6) ($P < 0.01$). Feeding 9% of pecans significantly increased deposition of Eicosapentaenoic acid (EPA, C20:5n3) when compared to 0 and 3% (0.15^{a}, 0.08^{ab}, 0.03^{b}, and 0.01^{b} for 9, 6, 0, and 3%, respectively). Additionally, the inclusion of 6% of pecans in diets led to greater values of Docosahexaenoic acid (DHA, C22:6n3) when compared to lamb fed 0 and 3% diets (1.12^{a}, 1.02^{ab}, 0.68^{bc}, and 0.60^{c} for 6, 9, 0, and 3%, respectively).

Conclusion

Inclusion of pecans in finishing diets did not affect performance and quality attributes of lamb. Corn has linoleic acid (C18:2n6) as the predominant fatty acid in the fat, whereas pecan has high levels of oleic acid (C18:1n9). In this study, feeding pecans positively affect nutritional value of lamb by increasing deposition of desirable fatty acids such as EPA and DHA, without compromising carcass weights, color, and lipid stability. Utilizing pecan byproducts as feeding source is a sustainable alternative for producers who may have access to this feedstuff.

