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Nutrient intake, in vivo digestibility, growth performance and carcass quality of growing lambs fed concentrate diets containing sweet lupin grain (Lupinus angustifolius)

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Abstract

This study aimed to evaluate the effect of feeding growing Awassi lambs on sweet lupin (LUP; Lupinus angustifolius) on nutrient intake, in vivo digestibility, growth performance and carcass quality. Twenty-seven lambs (average body weight (BW) 16.5 ± 0.88 kg) were assigned randomly to 3-diet groups, namely:1) no LUP (CON), 2) 125 g/kg LUP (LUP125) or 250 g/kg (LUP250) dry matter (DM) in replacement of portion of barley grain and soybean meal. The study lasted for 84 days (first 7 days were used as adaptation period followed by 77 days to collect the data). Nutrient intake was measured daily. Lambs' BW was measured at the commencement of the study and every two weeks during the whole study. On day 60, 15 lambs (5 from each group) were chosen at random and moved to metabolism cages to determine nutrient in vivo digestibility and N balance parameters. Lambs fed LUP250 showed greater ($P \leq 0.05$) intakes of DM, crude protein and ether extract than the CON and LUP125 fed groups; however, their NDF data tended ($P = 0.07$) to surpass other groups. Intake of metabolizable energy was greater ($P = 0.02$) in lupin-containing diets than the CON diet. Lambs' fed LUP250 diet had greater ($P < 0.05$) total gain and average daily gain than the CON diet. In vivo digestibilities, N retention, carcass characteristics of longissimus muscle linear dimensions and cooking loss was not affected by treatment. The CON-fed lambs had the highest ($P < 0.001$) water holding capacity followed by the LUP250 and LUP125 groups. The whiteness (L*) and yellowness (b*) were lower ($P \leq 0.05$) for the LUP125 diet than the CON and LUP250 diets. From the study, it can be concluded that the inclusion of sweet lupin at 250 g/kg DM improved the growing performance without affecting carcass characteristics of lambs.