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Work area: Nutrition and ruminant production

Nitrogen balance in the diet of spineless cactus-based associated with increasing levels of urea for Santa Inês lambs

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Soybean meal is widely used as a protein source in the diet of ruminants, as it has a positive impact on nitrogen balance (NB) and ensures high-quality protein. The high cost of soybean meal in the market leads many producers to seek alternative protein sources that minimize expenses without compromising quality. Among the alternative protein sources, urea stands out, which, when associated with ingredients with high levels of rapidly fermentable carbohydrates, releases nonprotein nitrogen (NPN). The aim is to evaluate diets based on spineless cactus with increasing levels of urea replacing soybean meal on nitrogen balance in lambs. Forty Santa Inês lambs, four months old, with an average weight of 22.2 ± 2.1 kg were fed a diet consisting of Mexican Elephant Ear spineless cactus (POEM), Tifton-85 hay, ground corn, sulfur flower, mineral mix, soybean meal, and increasing levels of urea (0; 7.3; 14.6 and 21.9 g/kg DM), replacing soybean meal. To perform NB, urine was collected around the 39th to the 42nd day of the analysis period, using a collector funnel adapted to the animals' morphology, with a hose attached. The urine was directed to a retention container containing 100 mL of 10% sulfuric acid (H2SO4) solution. The daily urine volume was measured over a 24-hour period, with a three percent sample taken and stored in a freezer at -20°C. NB was calculated by the equation: N retained (g/day) = N ingested - N fecal - N urinary, and the percentages of N absorption and retention were calculated by the equations: % N absorbed = (N absorbed / N ingested) x 100 % and N retained = (N retained / N ingested) x 100 respectively. The increasing levels of urea did not influence ($P > 0.05$) the amounts of ingested N, fecal N, absorbed N (% of ingested). Urinary N had a quadratic influence ($P = 0.0091$), with the highest excretion being 9.5 g/day in animals fed with a urea level of 7.3 g/kg DM and the lowest excretion being 7.5 g/day in those fed at the 21.9 g/kg DM urea level. Retained N (% of ingested) increased linearly ($P = 0.0275$) and was influenced quadratically ($P = 0.0003$), with a lower amount of 34.33% in animals fed at the 7.3 g/kg DM urea level and a higher amount of 44.45% in those fed at the 21.9 g/kg DM urea level. One of the factors that may have led to greater changes in the diet with 7.3 g/kg DM is the variable digestion of the animals. It can be concluded that increasing levels of urea in a diet based on POEM can partially or completely replace soybean meal in the diet of lambs, with little effect on NB.

Keywords: protein sources, non-protein nitrogen, lambs, Opuntia stricta, semiarid

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