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Ruminant nutrition and production

Economic evaluation of the inclusion of lipid sources and cactus in the diet of lactating goats

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The pursuit of cost reduction in production is paramount, given that food expenses constitute a substantial portion of overall costs. Lipid supplementation, through enhancing the diet's energy density, has the potential to enhance productivity, optimize resource utilization, and bolster the economic sustainability of goat milk production. Consequently, the aim was to assess lipid sources as a means to lower food expenses, with or without the inclusion of cactus pear Mexican Elephant Ear (PMEE), *Opuntia stricta* HAW., in goat milk production. The study was carried out at the Department of Animal Science at the Federal Rural University of Pernambuco. Twelve lactating Saanen goats were utilized, with 60 days in milk, an average body weight of 55.0 ± 8.0 kg, and a daily milk yield of 3.5 kg. The animals were randomly assigned to a double 4x4 Latin square design, with a 2x2 factorial arrangement (two lipid sources, either associated or not with cactus pear). The dietary ingredients consisted of Tifton-85 hay, PMEE, ground corn, soybean meal, mineral supplement, and either whole cottonseed (CT) or coconut fruit pulp by-product (CPB), resulting in four treatment diets: 5% PC; 5% PC + 25% PMEE; 20% CT; 20% CT + 25% PMEE. Feed costs were calculated by multiplying the individual cost of each ingredient by the consumption of each diet and were expressed as the average cost per animal. The variables were subjected to analysis of variance, and means were compared, assuming a 5% significance level. The economic evaluation was not subjected to statistical analysis, as the observed economic differences were based on greater profitability. The utilization of diets containing PMEE proved to be more effective ($P<0.05$) in terms of dry matter (DM) intake and milk production. The diet consisting of CPB+PMEE exhibited the lowest cost per kilogram of drya matter at R$ 1.78, whereas the other diets had the following values: CPB R$ 2.28; CT R$ 2.46; CT + PMEE R$ 1.97. The combination of PMEE with Tifton-85 hay resulted in a 45% reduction in roughage costs. The treatment with the lowest break-even point was CPB, requiring 0.85 kg of milk per day to cover feeding expenses, while the other diets showed CPB + PMEE at R$ 1.10; CT at R$ 1.05; CT + PMEE at R$ 1.33. The diet that yielded the most favorable results was CT+PMEE, despite not having the lowest cost per kilogram of dry matter. This diet provided the highest milk yield, resulting in the greatest net income among the treatments at R$ 4.19 per day, which is derived from gross income minus feeding costs. Among the evaluated diets, the combination of CT+PMEE is recommended for feeding lactating goats, owing to the reduced feeding costs and improved animal performance.

Keywords: cactus pear, feed costs, semi-arid, animal science.

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