

Milk yield and composition of crossbred goats supplemented with vegetable oil

Darklê L. Souza^{1*}, Ariosvaldo N. Medeiros², Marco A. D. Bomfim³, Marcos J. Araujo⁴, Aldivan R. Alves², Mayara A. Sabedot² and Rita de Cássia R. E. Queiroga⁵

* ¹Federal Institute of Alagoas – Campus Santana do Ipanema, Santana do Ipanema, Alagoas, 57500-970, Brazil; ²Federal University of Paraíba, Areia, Paraíba, 58397-000, Brazil; ³National Goat Research Center - EMBRAPA, Sobral, Ceará, 62010-970, Brazil; ⁴Federal University of Piauí, Bom Jesus, Piauí, 64900-000, Brazil; ⁵Federal University of Paraíba, João Pessoa, Paraíba, 58059-900, Brazil.

* darkleluiza@yahoo.com.br

The use of vegetable oils from native plants of the northeastern Semi-arid region in animal feeding can contributing not only for animal supplementation during periods of shortage but also for reforestation and, thus, collaborating with preservation and appreciation of the native vegetation, as well as the adapted exotic vegetation. The increase in the energy density of diets obtained with inclusion of lipids can have benefits such as reducing the negative effects of high amounts of concentrates rich in starch, on the rumen environment. The aim of this study was to evaluate the influence of faveleira, sesame and castor oils supplemented to milking goats on the yield and composition. A double Latin square experimental design (4×4) using 8 confined crossbred Saanen x Alpine goats was performed according to the following treatments: nonsupplemented (control), 4% castor oil, 4% sesame oil and 4% faveleira oil. The transformation of the TDN values to digestible energy DE (Mcal kg⁻¹) = 0.04409 × %TDN was performed through the equations: ME (Mcal kg⁻¹) = DE (Mcal kg⁻¹) × 0.86 considering 0.86 as the efficiency of utilization of DE. For the conversion of TDN in net energy (NE), it was adopted the equation NE_m (Mcal kg⁻¹) = 0.0245 × %TDN - 0.12. The animals were weighted at the beginning and end of each experimental period to asses weight change. The goats were manually milked twice daily. Before milking, the udder was cleaned and the strip-cup test was performed to detect mastitis. Post dipping was performed after milking using a commercial iodine solution. Milk yield (kg/day) was determined during the 1st, 3rd and 5th days of each experimental period. A composed sample per animal was collected using proportional amounts from morning (60%) and afternoon (40%) milking and used for physicochemical analyses. Previously sterilized polyethylene bottles (200 mL) were used for milk storage (-20°C). The procedures of milking and milk manipulation followed the recommendations of the legislation of goat milk. Physicochemical analyses were carried out on 32 composed milk samples from 4 treatments and 4 periods in a double Latin square design (4×4×2). Were determined Protein, Milk DM, Fat content of milk samples was determined by the Gerber method, and Lactose was determined by the Fehling reduction method. The density index was measured by a thermolactodensimeter at 15°C and the acidity, was expressed in °D. The fat corrected milk yield FCM 4% (kg day⁻¹) = 0.4 × milk (kg day⁻¹) + 15 × fat (kg day⁻¹) and the solid corrected milk yield SCM (kg day⁻¹) = 12.3 (milk fat, kg day⁻¹) + 6.56 (SNF, kg day⁻¹) - 0.0752 (milk yield, kg day⁻¹). Feed efficiency was determined by dividing the FCM by the dry matter intake (DMI) verified over the sampling period. Treatment means were compared by Tukey's test, adopting α = 0.05 using SAS (SAS Inst. Inc., Cary, NC.). Faveleira oil provided higher net energy intake. Addition of oil in the diets decreased the efficiency of utilization of metabolizable energy (ME) to milk yield, however the gross energy efficiency and net energy balance were not affected. The addition of 4% faveleira or sesame oil does not damage the performance and characteristics of the milk produced. On the other hand, the use of castor oil during lactation depresses the milk yield and its protein content. The addition of the oils does not influence feed efficiency, the efficiency of N use or in the energy intake taking the faveleira oil improved net energy intake. The efficiency of utilization of ME is reduced with the addition of oil in the diet of lactating dairy goats.

Keywords: castor oil, fat corrected milk, faveleira oil, goat milk, sesame oil, total solids