Effect of Sunflower Oil on Sheep Milk Production and Composition, and in vitro Rumen Fermentation

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Feeding vegetable oils rich in linoleic acid has been proved to be an effective strategy to enrich cow’s milk with conjugated linoleic acid (CLA). However, little is known in sheep. This work was carried out to study the effect of feeding sunflower oil (SO) on ewes milk production and composition (including fatty acids profile and CLA), and in vitro rumen fermentation. Twenty four Assaf ewes were fed ad libitum two diets: control or supplemented with 6% SO (2 lots of 6 animals per diet) for 4 weeks. Both diets (80/20 concentrate/forage ratio) contained 17% crude protein. Intake, and milk yield and composition were recorded weekly. Fatty acid (FA) profile of milk fat was determined by GC. Differences between diets in fermentation rates and ruminal parameters were studied using the in vitro gas production technique. Ruminal inocula were collected from 4 cannulated sheep fed the control diet. In vivo data were analyzed by repeated measures analysis, with measurements at 0-week as a covariate. Data from the in vitro trial were analyzed as a one-way analysis of variance. The interaction "diet × time" was never significant (P>0.10). No differences (P>0.10) between treatments were found in dry matter intake (2.40 kg/d) and milk production (1728 g/d). Although the SO diet increased milk fat percentage (P<0.05) and tended to reduce milk protein content (P<0.10), it did not affect milk fat, protein or total solids yields (88, 85 and 264 g/d; P>0.10). The proportions of milk CLA and trans-11 C18:1 (TVA) were significantly higher in ewes receiving SO (3.9 vs. 1.0 and 8.6 vs. 2.2 % of total FA; P<0.05), whereas percentage of C12, C14 and C16 were lower. This diet also increased trans-10 C18:1 content (4.9 vs. 0.8 % of total FA; P<0.01). Concerning in vitro rumen fermentation, no differences (P>0.10) were found in extent and rate of gas production, effective degradability, in vitro true digestibility or total volatile fatty acids production. However, SO diet tended (P<0.10) to reduce the production of propionic acid. Results demonstrate that dairy sheep milk CLA and TVA contents could be noticeably increased by the addition of SO in the diet, without detrimental effects on ruminal fermentation and milk production.