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Effect of Alternative Feeds Characteristic for Mediterranean Dry Areas on the Quality of Milk and Dairy Products from Awassi Sheep

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Abstract

Small ruminants constitute an integral part of the farming system in many dry areas of the Mediterranean basin. Alternative feeds may provide a solution to overcome the frequent shortage of feeds but their successful integration depends on their ability for improving milk production without negatively affecting the quality of milk and dairy products. In the present study, five alternative feeds were compared to a control diet in an experiment conducted at ICARDA, Syria. Per diet, ten Awassi ewes (51.0 ± 6.5 kg) were allocated in a randomised block design considering days-in-milk, milk yield and composition. Diets were isonitrogenous and isoenergetic, and had forage:concentrate ratios of 0.3:0.7. The test feeds constituted 30% of the diets replacing control diet ingredients (barley straw by lentil straw, olive leaves or Atriplex leaves; and wheat bran/cottonseed meal by olive cake or tomato pomace). Animals were group-fed with 2.5 kg dry matter/day and water ad libitum. The experiment lasted for 50 days and milk sampling and yield were recorded weekly. Three times milk was pooled per group and processed to yoghurt and fresh cheese. In addition to mechanical texture measurements, compositional analyses and sensory tests were performed. Data were subjected to GLM (effects: diet and time). Milk yield and composition of milk and processed products changed with time, but did not significantly differ among treatments, except after six weeks, with a high milk fat content from diets containing tomato pomace (7.5%) and olive cake (7.4%). The traditional feed resulted in the highest yogurt firmness (0.266 N) followed by the Atriplex diet (0.190 N), while yoghurt was softest with tomato pomace (0.114 N). The olive cake diet provided the hardest cheese (0.726 N) while cheese was softest with lentil straw (0.429 N). Consequently, the sensory panel ranked yoghurt from traditional feed (4.2/5) and cheese from olive cake (4.0/5) first, while diets with olive cake (3.7/5) and olive leaves (3.2/5), resulted in lowest scores for yoghurt and cheese, respectively. The results suggest that balanced diets with alternative feeds can be successfully introduced as the quality of dairy products is mostly similar or even slightly better than those from traditional feeds.

Keywords: Atriplex, awassi, livestock, olive cake, ruminant, tomato pomace