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Effect of Spirulina Supplementation on Growth Performance and Body Conformation of Two Omani Goat Breeds

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Abstract : This study was conducted at the Livestock Research Centre, Ministry of Agriculture and Fisheries, Oman, on two local goat breeds (Jabbali and Sahrawi) due to their importance to Omani livestock production and food security. The Jabbali is characterized by increased growth rates and a higher twinning rate, while the Sahrawi has increased milk production. The aim of the study was to investigate the effect of Spirulina supplementation on live weight (BWT), average daily gain (ADG), and body conformation measurements; chest girth (CG), wither height (WH), body length (BL), and body condition score (BCS). Thirty-six males (approximately nine-months-old and 16.44 ± 0.33 kg average of initial body weight) were used across an eleven-week study from November–February 2019-2020. Each breed was divided into three groups (n = 6/group) and fed one of three rations: (1) concentrate mixture (Control) with crude protein 14% and energy 11.97% MJ/kg DM; (2) the same concentrate feed with the addition of 2 gm /capita daily Spirulina platensis (Treatment 1) and (3) the same concentrate feed with the addition of 4 gm /capita daily Spirulina platensis (Treatment 2). Analysis of weekly data collections for all traits indicated a significant effect of feeding Spirulina on all the studied traits except WH and BL. Analysis of variance for fixed effects in this study (damage and kid birth type i.e., single, twin or triple) were not significant for all studied traits. However, the breed effect was highly significant ($P < 0.001$) on BWT, ADG, BCS, and CG traits. On the other hand, when the analysis was done for the treatment effect within breeds for ADG, the Sahrawi breed had a significant effect ($P < 0.05$) at 56.52, 85.51, and 85.50 g/day for control, treatment 1 and treatment 2, respectively. This is a 51% difference between the control and treatment 1 (2 gm /capita). Whereas for the Jabbali breed, the treatment effect was not significant for ADG ($P = 0.55$), and the actual ADG was 104.59, 118.84, and 114.25 g/day for control, treatment 1, and treatment 2, respectively, providing a 14% difference between the control group and the treated group (4 gm /capita). These findings indicate using Spirulina supplementation in Omani goat diets is recommended at 2 gm per capita as there was no benefit in feeding at 4 gm per capita for either breed. Farmers feeding Spirulina supplementation to kids after weaning at six-months could increase their herd performance and growth rate and facilitate buck selection at an earlier age.

Keywords : body conformation, goats, live weight, spirulina
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