MINISTRY OF JIHAD-E-AGRICULTURE
Agricultural Research, Education and Extension Organization
Agriculture and Natural Resources Research and Education Center of Bushehr

Investigating effects of Ziziphus (*Ziziphus mauritiana*) tree branches with or without fat supplementation on performance, rumen fermentation, behavior and fatty acids profile of Adani goat kids meat and dairy goats milk

Research worker: Mahmoud Dashtizadeh

Abstract

Three experiments were conducted in order to investigate the inclusion of Konar *(Ziziphus mauritiana)* branches containing tannins and sunflower oil as a source of poly unsaturated fatty acids in high concentrate diets on rumen gas production (*in vitro*) and performance, production, fermentation and behavioral characteristics in Adani goat growing kids and dairy goats milk. The Konar branches used in these experiments contain 95% dry matter, 14.5% crude protein, 1.93% ether extract, 33% NDF, 18% ADF, 2.60 % Ca, 0.34% P, total phenol 12.54% and total tannin 9.12%. The fermentation parameters of the diets were compared using gas production methods **(first experiment).** Dietary treatments were control, 20% Konar branches, 2.5 % sunflower oil and, 2.5 % sunflower oil +20% Konar branches. Effective dry matter and crude protein degradability decreased in diets containing Konar branches. Gas production potential and gas production rate were significantly increased by addition of sunflower oil. An increase in true organic matter digestibility (TOMD) and microbial mass production (MB) ($P<0.01$) observed using Konar branches in the diet. **The second experiment** was conducted in hot ambient temperature using 32 Adani dairy goat, in a completely randomized design with a 2×2 factorial arrangements. Significant increases in respiration rate (RR) and rectal temperature (RT) were observed in control goats. Heart rate (HR) in sunflower oil treated goats decreased significantly ($P <0.05$). Significant interaction in dry matter intake ($P=0.01$), fat percent and milk solids were observed. Dry matter intake of treatments fed Konar branches and oil were lower than control and mixture of Konar branches and oil treatments. PUFA concentration in milk fat of the mixture of Konar branches and sunflower oil diet showed a tendency to increase ($P = 0.04$). MCFA concentration in milk fat of goats fed Konar branches was higher compared to other treatments. The inclusion of sunflower oil decreased NDF and ADF digestibility. An increase in blood cortisol concentration in control treatment observed compared to other treatments ($P <0.05$). **The third experiment** was conducted to study the effects of the diets on performance, meat quality and fatty acids profile, an experiment was conducted using 32 Adani male goat kids, in a completely randomized design with a 2×2 factorial arrangement of treatments for 75 days. Oil inclusion in the diet tended to increase daily weight gain ($P=0.06$) and tended to decrease feed conversion ratio ($P=0.07$) of goat kids. Inclusion of konar branches in the diet increased the polyunsaturated fatty acids to

saturated fatty acids ratio in LD muscle of goat kids ($P<0.05$). The fat content of LD muscle increased with the inclusion of oil to the diets ($P<0.01$). The diet containing Konar leaf had the lowest amount of nutrient digestibility, but by using Konar leaf in the diet containing oil, no decrease in nutrient digestibility was observed, which this different behavior, led to significant interaction between the two factors. Consumption of Konar branches diets caused a significant increase in feed intake (minutes per day) ($P=0.03$). The results of this study show that the use of Konar leaves and sunflower oil in the diet of Adani goats can improve the nutritive value of their milk and meat by reducing saturated fatty acids and increasing polyunsaturated fatty acids.
Keywords: Konar branches, Sunflower oil, Adani growing goat kid, Adani dairy goat, Performance.