

PRODUCTION OF HIGH QUALITY MILK BY USING NATURAL PLANT COMPOUNDS IN LACTATING GOATS' DIETS

By

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ABSTRACT

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To study the effect of feeding lactating goats on some medicinal plant, two experiments were carried out. The first experiment aimed to determine the proper level of *Echinacea purpurea*, *Nigella sativa* and *Cichorium intybus* to be used in ruminant rations using in vitro techniques. In the second experiment, twenty Damascus lactating goats weighting 29.2 ± 1.96 Kg LBW (2.5 – 3 years old) were used in this experiment. Animals were randomly divided into five groups where the control group (G_1) was given a basal diet, G_2 was given the basal diet mixed with 4 g/h.d *Echinacea purpurea*, G_3 was given the basal diet mixed with 8 g/kg *Echinacea purpurea*, G_4 was given the basal diet mixed with 7.5 g/h.d *Nigella sativa* and G_5 was given the basal diet mixed with 10 g/h.d *Cichorium intybus* for 98 days. The results obtained from the first experiment showed that the levels of 8 g *Echinacea purpurea*, 7.5 g *Nigella sativa* and 10 g *Cichorium intybus* / kg DM diet, had improved both dry matter and organic matter disappearance in the rumen. While the results of the second experiment showed that, the rumen parameter (pH – TVFs' – Ammonia) tend to increase significantly ($P \leq 0.05$) in G_2 . Digestion coefficients of all nutrients (DM – OM – EE – CP – CF) tend to be higher in the treated groups compared with the control group.

Using medicinal plants lead to improve milk production in the treated groups than control group, where milk production was 1345.4, 1718.4, 1516.8, 1363.3 and 1380.0 g/h/d for G₁, G₂, G₃, G₄ and G₅, respectively. Regarding to milk composition, milk fat % in the treated groups was slightly higher than the control group. However total milk protein % was lower in G₃, G₅ and G₄ compared with G₂ and G₁. The values of milk protein percent were 2.89, 2.93, 2.77, 2.52 and 2.57 %, for G₁, G₂, G₃, G₄ and G₅, respectively. Using *Echinacea purpurea* effectively decreased somatic cell counts (SCC) in G₂ and G₃. Also adding *Nigella sativa* and *cichorium intybus* to the lactating goats' diets tend to decrease SCC. The obtained values of SCC were 608.1, 64.3, 96.7, 179.0, and 105.2 *10³ CFU for G₁, G₂, G₃, G₄ and G₅, respectively. Total microbial count was affected by adding *Echinacea purpurea* and *Nigella sativa*, where G₂ recorded the lowest count followed by G₃ then G₄ (5.17, 5.18 and 5.38, respectively). Also, G₂ and G₃ recorded the lowest count of *Staphylococci* count and *St. aureus* count than G₅, G₄ and G₁. The results indicated that using *Echinacea purpurea*, *Nigella sativa* and *cichorium intybus* as additives in the dairy goats' diets tend to improve nutrient digestion coefficient also improve milk quantity and quality.

Key Words:

medicinal plant, *Echinacea purpurea*, *Nigella sativa*, *Cichorium intybus*, milk production, milk composition, somatic cell counts, microbial count, *Staphylococci* count, *St. aureus* count.

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