

Effect of Extract Crushed Fenugreek Seeds as Feed Additive on some Blood Parameters, Milk Yield and Its Composition of Lactating Egyptian Buffaloes

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ABSTRACT

Milk production & composition and some blood parameters were examined in Egyptian buffaloes as affected by supplemented basal diet by crushed Fenugreek seeds. Sixteen lactating buffaloes aged 5-7 years (at the third and fifth seasons of lactation); 45 days from calving were divided into four dietary treatments, 4 animals per each. Buffaloes were fed individually on basal diet ration [concentrate feed mixture (CFM) and rice straw (RS)] according to developing of body weight and milk production during the whole experimental periods. The crushed Fenugreek seeds were given as feed additives to the basal ration at a level 100, 150 and 200 g/buffalo/ day for 2nd, 3rd and 4th treatments, respectively, while the 1st treatment considered as control. The results indicated that the dry matter intake (DMI) was significantly ($P < 0.05$) increased in T₃ and T₄ than other groups. Also, crushed fenugreek seeds significantly ($P < 0.05$) increased nutrient digestibilities (DM, OM, CP and EE). The total milk yields were 806.4, 896.0, 952.0 and 907.2 Kg, respectively. Also, the overall daily milk yield was 7.2, 8.0, 8.5 and 8.1 Kg/h/d for T₁, T₂, T₃ and T₄, respectively. Lactose percentage significantly ($P < 0.05$) increased in treated buffaloes. However, fat percentage was significantly ($P < 0.05$) decreased with treated buffaloes. The calculated efficiency of milk yield/DMI was increased ($P < 0.05$) in Fenugreek treated buffaloes. The addition of crushed Fenugreek seeds increased ($P < 0.05$) the level of blood plasma prolactin and GPT in lactating buffaloes. It could be concluded that adding fenugreek seeds to buffalo's rations at 100, 150 and 200 g/buffalo/day led to raising economic efficiency by about 6.6, 3.95 and 7.89 %, respectively and it could be recommended to improve feed efficiency, milk yield and economic efficiency.

Keywords: Fenugreek seed, Lactating buffaloes, milk yield, Prolactin hormone.

INTRODUCTION

Buffaloes produce about 60 and 40% of milk yield and meat production in Egypt, respectively (Agriculture Economy Research Institute, 2003). The world health organization encourages using medicinal herbs and plants to substitute or minimize the use of chemicals through the global trend to go back to nature. The use of herbal galactogogues is known to have beneficial effect on milk production (Salama *et al.*, 2015). Medicinal herbs are important materials that can improve feed efficiency and performance of lactation buffaloes. Fenugreek (*Trigonella foenum-graecum* L) is cultivated in Egypt and in various parts of the world. The seeds of this herb have been used in traditional medicine to promote lactation in lactating women (Tiran, 2003). Also, this herb has been shown to influence the lactation performance in ruminants. In goats, feeding on 60 g of fenugreek seeds powder per day increased milk yield without any effects on milk fat percentage (Alamer and Basiouni 2005). In buffaloes, fenugreek seeds feeding increased milk yield but without any effects on milk composition except for a tendency of lower fat content (El-Alamy 2001). Feeding costs of buffaloes represent about 65-70 % of the total current costs. Improving milk production contributes to improve feed efficiency and economic return.

Therefore, this study was designed to examine the effect of crushed fenugreek seeds addition to Egyptian lactating buffalo's diets on feed intake, digestibility, nutrient value, milk yield and composition, as well as some blood parameters.

MATERIALS AND METHODS

This study was carried out at Sids Animal Production Research Station, Beni-Seuf Governorate,

Animal Production Institute, Ministry of Agriculture, Egypt.

Experimental Animal and Feeding System:

Sixteen lactating buffaloes (at the third and fifth seasons of lactation), 45 days from calving were divided into four equal groups. The animals were randomly assigned to feeding four experimental rations. The overall mean of buffaloes weight were 559, 554, 551 and 560 Kg for T₁"control", T₂, T₃ and T₄, respectively. The experimental period lasted 16 weeks (starting from 45 days after calving).

Control group (T₁) fed CFM and RS without feed additive (basal diet), whereas, buffaloes in T₂, T₃ and T₄ were fed basal diet supplemented with crushed fenugreek seeds by 100, 150 and 200 g/buffalo/day, respectively.

The CFM consisting of 21% undecorticated cotton seed meal, 35% wheat bran, 5% molasses, 35% yellow corn, 2.5% limestone, 1% salt and 0.5% mineral mixture. Animals were fed individually according to requirements of (APRI, 1997) for lactating buffaloes. Feeding allowances were weekly adjusted according to changes in body weight and milk production. All experimental rations were formulated to contain 60 % CFM and 40 % rice straw. Rations were offered twice daily at 8 a.m. and 4 p.m., fresh and clean drinking water was offered three times daily, at 7 a.m., 3 p.m. and 8 p.m.

Digestibility trial:

Nutrient digestibility and feeding values were determined by chosen 3 buffaloes randomly from each group, using acid insoluble ash (AIA) technique of Van Keulen and Young (1977). Feeds and feces were sampled and the conventional analytical methods of AOAC (1995) were applied. Also, digestibility coefficient and feeding values of the tested rations were determined. Total digestible nutrients (TDN) and digestible crude protein (DCP) calculated according

to classic formula of McDonald *et al.*, (1995). While digestible energy (DE Mcal/Kg DM) was calculated according to Nehring and Haenlien (1973).

Sampling and Analysis of Milk:

Buffaloes were hand milked twice daily (7 a.m. and 4 p.m.) during the experimental period (112 days) and milk yields were recorded individually at each milking. Milk Samples were collected once every two weeks. Milk samples were analyzed for fat, total solids, total protein and ash (Ling, 1963), Lactose content (Barett and Abd El-Tawab, 1957). Solids not fat (SNF) was calculated by difference. Milk was adjusted as 7 % fat corrected milk (FCM) using the formula given by Raafat and Saleh (1962) as follows: 7 % FCM = 0.265 × milk yield + 10.5 × fat yield.

Blood Plasma Constituents:

Heparinized blood samples were collected from the jugular vein from each of the experimental buffaloes at the end of feeding trial. Blood samples were centrifuged at 4000 r.p.m for 20 minutes to separate of plasma which were stored at -20c° till analysis. Blood plasma samples were analyzed for prolactin, glutamic oxaloacetic transaminase (GOT) and glutamic pyruvic transaminase (GPT) in the division of radioisotopes application, nuclear research center, Atomic Energy department, Cairo, Egypt.

Economic efficiency:

Economic efficiency was calculated on the basis of daily feed cost and price of daily milk yield. Prices of feedstuffs and feed additive on dry matter basis were 2.52, 0.45 and 3.50 LE / kg for concentrate feed mixture, rice straw and fenugreek seeds, respectively. While, price of daily milk yield = 5.00 LE / kg.

Statistical Analysis:

The statistical analysis system (SAS, 2001) was used for least square of variance for repeated measures of milk yield, milk composition, feed efficiency parameters and data of blood plasma analysis. The following model was applied:

$$Y_{ij} = \mu + T_i + e_{ij}$$

Where:

μ = General mean of treatment population.

T_i = Effect of treatment (T₁, T₂, T₃, T₄).

E_{ij} = Experimental error.

The differences between means were detected by Duncan's Multiple Range test (Duncan, 1955).

RESULTS AND DISCUSSION

Chemical composition:

The chemical composition of ingredients and experimental rations are shown in Table (1). Results showed that adding crushed fenugreek seeds to the experimental rations at rate of 0, 100, 150 and 200 g for control (T₁), T₂, T₃ and T₄, respectively increased of DM, CP, EE, CF and ash contents in T₂, T₃ and T₄ compared to control (T₁). While OM and NFE contents had opposite trend.

Table 1: Chemical composition of ingredients and the experimental rations on DM basis:

| Item | DM | OM | CP | EE | CF | NFE | ASH |
|-----------------|-------|-------|-------|-------|-------|-------|-------|
| CFM | 92.60 | 90.80 | 14.40 | 4.50 | 15.40 | 56.50 | 9.20 |
| RS | 90.60 | 85.40 | 3.20 | 1.10 | 36.20 | 44.90 | 14.60 |
| FG | 95.80 | 95.90 | 20.60 | 11.80 | 8.20 | 55.30 | 4.10 |
| Rations: | | | | | | | |
| R ₁ | 91.80 | 88.64 | 9.92 | 3.14 | 23.72 | 51.86 | 11.36 |
| R ₂ | 92.46 | 88.61 | 10.06 | 3.22 | 23.78 | 51.55 | 11.39 |
| R ₃ | 92.74 | 88.60 | 10.12 | 3.26 | 23.80 | 51.42 | 11.40 |
| R ₄ | 93.16 | 88.58 | 10.21 | 3.31 | 23.84 | 51.22 | 11.42 |

CFM= Concentrate Feed Mixture, RS= Rice Straw, FG= Fenugreek seeds.

R₁, 60% CFM+40% RS; R₂, 60% CFM+40% +100 g FG; R₃, 60% CFM+40% RS +150g FG and R₄, 60% CFM+40% RS +200 g FG.

Feed Intake, Nutrients Digestibility and feeding values:

Dry matter intake (DMI) for buffaloes fed T₃ rations was significantly (P<0.05) higher than those recorded for T₁, T₂ and T₄ as shown in Table (2). These results were agreement with those reported by Abo El-Nor (1999) and Abo El-Nor *et al.*, (2007) they found that DM intake was increased when lactating buffaloes fed different levels of fenugreek seeds. Tomar *et al.*, (1996) and Nasser *et al.*, (2013) found that the fenugreek seeds stimulates feed intake in dairy cattle, resulting in a significant increase in milk production. Also, Petit *et al.*, (1993) reported isolated steroidal saponin fraction of fenugreek seeds which increase feed intake and motivation to eat in normal rats.

Table 2: Effect of treatments on feed intake, digestibility coefficients and feeding values.

| Items | Treatments | | | | ±SE |
|-------------------------------|--------------------------|---------------------|--------------------|---------------------|------|
| | T ₁ "control" | T ₂ | T ₃ | T ₄ | |
| DMI (Kg/h/d) | 13.50 ^b | 13.90 ^b | 14.74 ^a | 13.79 ^b | 0.22 |
| CFM (Kg/h/d) | 8.50 ^b | 8.80 ^b | 9.60 ^a | 8.60 ^b | 0.11 |
| Rice Straw (Kg/h/d) | 5.00 | 5.00 | 5.00 | 5.00 | |
| FG seed (g/h/d) | 0.00 | 95.80 | 144.00 | 192.00 | |
| Digestibility coefficient, %: | | | | | |
| DM | 60.50 ^b | 66.00 ^a | 68.30 ^a | 66.10 ^a | 2.10 |
| OM | 61.30 ^b | 66.10 ^a | 70.30 ^a | 66.40 ^a | 1.50 |
| CP | 63.10 ^b | 70.80 ^a | 74.10 ^a | 71.10 ^a | 1.60 |
| CF | 53.40 | 54.60 | 53.00 | 54.00 | 8.40 |
| EE | 69.30 ^b | 75.00 ^a | 76.00 ^a | 74.20 ^a | 1.90 |
| NFE | 70.80 | 70.10 | 71.00 | 70.40 | 9.50 |
| Nutrients value, %: | | | | | |
| TDN | 67.28 ^b | 69.13 ^{ab} | 70.06 ^a | 69.10 ^{ab} | 2.04 |
| DCP | 6.37 ^c | 7.23 ^b | 7.61 ^a | 7.37 ^b | 0.05 |
| DE | 2.86 | 2.95 | 3.00 | 2.95 | 0.08 |

^{a, b} = means with different superscripts in the same row are differ significantly (P<0.05).

Results in Table (2) showed that digestibility coefficients of DM, OM, CP and EE were significantly (P<0.05) increased in supplemented groups than control, these results were agreement with the findings of Abo El-Nor *et al.*, (2007) and Atta Elman *et al.*, (2013) they reported that there was an improvement in digestibility coefficients of lactating animals fed fenugreek seeds. The improvement in digestibility could be justified on the basis of that fenugreek seeds contains saponins,

which stimulate an aerobic fermentation of organic matter that improve efficiency of nutrients utilization.

Energy values of total digestible nutrients (TDN) and digestible crude protein (DCP) of the experimental rations in Table (2) had significant increase in fenugreek seeds containing rations (T₂, T₃ and T₄) except in T₂ regarding TDN compared to control (T₁), while digestible energy (DE) was not affected by fenugreek seeds addition.

Milk Yield:

The total milk yield for T₁, T₂, T₃ and T₄ were 806.4, 896.0, 952.0 and 907.2 Kg, respectively. Also, the overall daily milk yield was 7.2, 8.0, 8.5 and 8.1 Kg/h/d, respectively (Table 3). FCM yield was improved in T₃ compared with T₁. While there no significant differences between T₂, T₃ and T₄, this result might be due to decrease milk fat in treated groups by fenugreek seeds.

Results as showed in Table (3) and Fig. (1). Revealed that total and daily milk yields in the treated groups (T₂, T₃ and T₄) were significantly (P<0.05) higher compared to the control (T₁). These results agreed with those of (Tomar *et al.*, 1996; Abo El-Nor *et al.*, 2007) they reported that feeding fenugreek increased milk production in buffaloes. The relative improvement in milk yield by crushed fenugreek seeds supplementation might be due to higher value of nutrients digestibility (Table 2). Also, Basha *et al.*, (1987) reported that fenugreek seeds contains some active components which stimulating the pituitary gland leading to release of prolactin hormone (Table 4). Present results indicated that prolactin hormone might be a possible candidate as a mediator of fenugreek action on milk production. The increase in prolactin hormone levels represents a possible endocrine mechanism for the galactopoietic effect of fenugreek.

Milk Composition:

The results of effect of fenugreek seeds on milk composition are shown in Table (3). Milk fat percentage was lower (P<0.05) in treated buffaloes by fenugreek seeds (T₂, T₃ and T₄) than untreated group (T₁). There is an inverse relationship between yield and fat percentage. The lower fat content of T₂, T₃ and T₄ can be justified by the higher milk yield secured by treated groups compared to control, this result agrees with El-Alamy *et al.* (2001) who found that feeding fenugreek seeds to buffaloes increase milk yield but without any effect on milk composition except for a tendency of lower fat content. Also, Al-Janabi (2012) reported that fenugreek seeds fed goats exhibited significantly (P<0.05) lower milk fat content as compared with control group.

Milk lactose percentage was higher (P<0.05) in buffaloes fed fenugreek seeds than control. The same trend was obtained by Abo El-Nor *et al.*, (2007) who reported that milk lactose content was higher (P<0.05) in buffaloes fed fenugreek seeds compared to control. However, milk protein; total solids, solid not fat and ash percentages were not affected by supplementing different levels of fenugreek seeds as shown in Table 3 and Fig. 2). This result agree with Abo El-Nor *et al.*,

(2007) who indicated that total solids, total protein and ash content did not differ significantly between buffaloes fed fenugreek seeds compared to control.

Table 3: Milk yield and composition of lactating buffaloes as affected by dietary treatments.

| Items | Treatments | | | | ±SE |
|-----------------------------|---------------------|---------------------|---------------------|---------------------|-------|
| | T ₁ | T ₂ | T ₃ | T ₄ | |
| Lactation length (d) | 112 | 112 | 112 | 112 | |
| Total milk yield (Kg) | 806.40 ^b | 896.00 ^a | 952.00 ^a | 907.20 ^a | 18.20 |
| Milk yield (Kg/h/d) | 7.20 ^b | 8.00 ^a | 8.50 ^a | 8.10 ^a | 0.40 |
| Fat corrected milk (FCM) | 6.82 ^b | 7.24 ^{ab} | 7.70 ^a | 7.25 ^{ab} | 0.41 |
| Milk composition (%) | | | | | |
| Fat | 6.50 ^a | 6.10 ^b | 6.10 ^b | 6.00 ^b | 0.40 |
| Protein | 3.70 | 3.60 | 3.70 | 3.60 | 0.19 |
| Lactose | 4.30 ^b | 4.90 ^a | 4.80 ^a | 4.80 ^a | 0.20 |
| Total solids | 15.20 | 15.50 | 15.40 | 15.20 | 0.51 |
| Solid not-fat | 8.70 | 9.40 | 9.30 | 9.20 | 0.90 |
| Ash | 0.80 | 0.77 | 0.76 | 0.78 | 0.05 |
| Feed efficiency: | | | | | |
| DMI / FCM | 1.98 ^a | 1.92 ^b | 1.92 ^b | 1.90 ^b | 0.03 |
| TDN / FCM | 9.86 ^a | 9.54 ^{ab} | 9.10 ^b | 9.53 ^{ab} | 0.08 |
| DCP / FCM | 0.93 ^b | 1.00 ^a | 0.99 ^{ab} | 1.02 ^a | 0.01 |
| DE / FCM | 0.42 | 0.41 | 0.39 | 0.41 | 0.01 |

^{a, b} = means with different superscripts in the same raw are differ significantly (P<0.05).

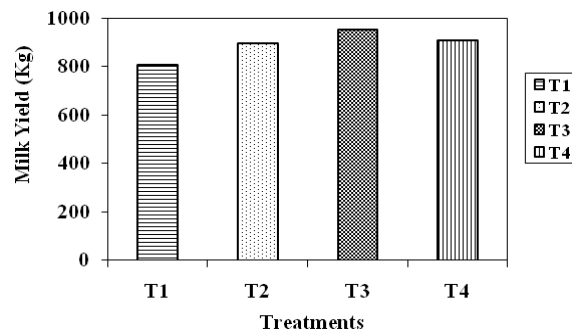


Fig (1) : Total Milk Yield (Kg)

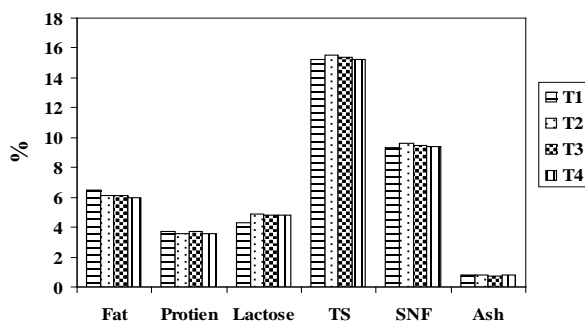


Fig (2): Milk Composition.

Feed efficiency:

Feed efficiency of DM intake, kg/kg FCM was improved significantly (P<0.05) when fenugreek seeds included at 100, 150 and 200 g in the rations (T₂, T₃ and T₄) compared with (T₁). Also, feed efficiency of TDN was improved in T₃ compared with T₁. While there no significant differences between T₂, T₃ and T₄ between T₁, T₂ and T₄. The opposite trend was

obtained with feed efficiency of DCP, while, feed efficiency of DE did not significantly differ among groups. These results are in partially agreement with the findings of Abo El-Nor *et al.*, (2007) and Nasser *et al.*, (2013) who reported that the efficiencies in milk yield calculated as DMI/Kg milk yield and milk yield / DMI were improved (P<0.05) in treated groups by fenugreek seeds as compared with control group.

Blood plasma constituents:

Data in Table (4) showed no significant differences among different treatments in GOT concentration levels, while GPT and prolactin levels were significantly (P<0.05) higher in treated buffaloes by fenugreek seeds compared to the control group. These results were in agreement with those reported by Abo El-Nor *et al.*, (2007) they found that the level of GPT was increased significantly (P<0.05) in treated buffaloes. Also, the increase of GPT may be illustrated on the basis that milk production of treated animals enhanced liver metabolism which lead to increase of GPT activity (Larson, 1985).

The improvement in milk yield for treated groups could also be due to the positive significant effect of crushed fenugreek seeds supplementation on prolactin hormone concentration levels (Table 4 and Fig. 3). Abo El-Nor (1999) reported that feeding lactating buffaloes with fenugreek seeds as feed additive increased prolactin hormone, which is considered one of the major hormones for milk synthesis and secretion.

Table 4: Effect of treatments on some blood parameters.

| Items | Treatments | | | | ±SE |
|-------------------|-----------------------------|--------------------|--------------------|--------------------|------|
| | T ₁ "control" | T ₂ | T ₃ | T ₄ | |
| Prolactin (ng/dl) | 2.72 ^b | 4.20 ^a | 4.80 ^a | 4.50 ^a | 0.40 |
| GOT (U/L) | 29.00 | 28.20 | 29.40 | 28.10 | 6.10 |
| GPT (U/L) | 12.70 ^b | 17.00 ^a | 17.80 ^a | 17.20 ^a | 0.60 |

^{a, b} = means with different superscripts in the same row are differ significantly (P<0.05).

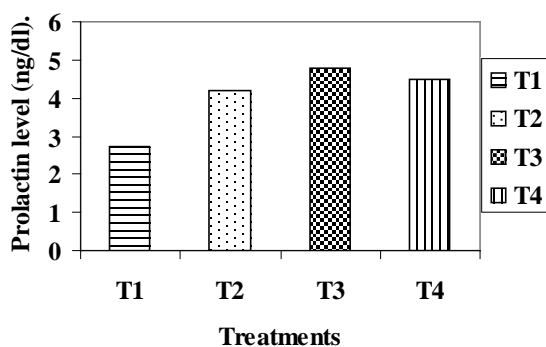


Fig (3) Prolactin level (ng/dl).

Economic efficiency:

Economic efficiency of feeding lactating buffaloes on the experimental rations in Table (5). Indicated that as the ratio between prices of milk yield / daily feed cost (cost of each head of feed intake plus the additional prices of fenugreek seeds) was higher in T₄ and T₂ then T₃ (inoculated rations by fenugreek seeds, respectively) compared to the control ration (T₁).

Table (5): Economic efficiency of lactating buffaloes fed the experimental rations.

| Items | Treatments | | | | ±SE |
|--------------------------------|--------------------|--------------------|--------------------|--------------------|------|
| | T ₁ | T ₂ | T ₃ | T ₄ | |
| DMI (Kg/h/d) | 13.50 ^b | 14.76 ^b | 14.74 ^a | 13.79 ^b | 0.22 |
| CFM (Kg/h/d) | 8.50 ^b | 8.80 ^b | 9.60 ^a | 8.60 ^b | 0.11 |
| Rice Straw (Kg/h/d) | 5.00 | 5.00 | 5.00 | 5.00 | |
| FG seed (g/h/d) | 0.00 | 95.80 | 144.00 | 192.00 | |
| Daily milk yield | 7.20 ^b | 8.00 ^a | 8.50 ^a | 8.10 ^a | 0.40 |
| Feed cost (LE/head/day) | 23.67 | 24.43 | 26.44 | 23.92 | |
| Cost of FG (LE/head/day) | 0.00 | 0.33 | 0.50 | 0.67 | |
| Daily feed cost (LE/head/day) | 23.67 | 24.76 | 26.94 | 24.59 | |
| Price of daily milk yield (LE) | 36.00 | 40.00 | 42.50 | 40.5 | |
| *Economic efficiency | 1.52 | 1.62 | 1.58 | 1.64 | |

^{a and b} : Means within each row under summer or winter with different superscripts are significantly differ (P<0.05).

Price of one kg (DM basis) of concentrate feed mixture (CFM), rice straw and FG were 2.52, 0.45 and 3.50 LE, respectively. While, milk price = 5.0 LE/kg.

* Economic efficiency = price of milk yield / daily feed cost.

It could be concluded that adding fenugreek seeds to buffalo's rations at 100, 150 and 200 g /buffalo/day led to raising economic efficiency by about 6.60, 3.95 and 7.89 %, respectively and it could be recommended to improve feed efficiency, milk yield and economic efficiency, this effect might be mediated via prolactin hormone stimulation.

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تأثير إضافة مستخلص مجروش بذور الحلبة لعليقة الجاموس المصري الحلاب على إنتاج اللبن وتركيبه وبعض مقاييس الدم

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تم دراسة تأثير إضافة مجروش بذور الحلبة لعلائق الجاموس المصري على إنتاج اللبن وتركيبه وبعض قياسات الدم. استخدمت في هذه الدراسة ١٦ جاموسة حلابة عمر (٧.٥) سنوات وفي موسمها الإنتاجي (الثالث - الخامس) وعند ٤٥ يوم من الولادة. تم تقسيمها إلى أربع معاملات غذائية، كل معاملة مكونة من أربع حيوانات متماثلة، والتغذية فردية: المعاملة الأولى غذيت على العليقة الأساسية فقط (عليقة مركزة + قش الارز) واعتبرت معاملة مقارنة (الكنترول)، المعاملة الثانية غذيت على العليقة الأساسية مضافاً إليها ١٠٠ جم / جاموسة / يوم من مجروش بذور الحلبة، المعاملة الثالثة غذيت على العليقة الأساسية مضافاً إليها ١٥٠ جم / جاموسة / يوم من مجروش بذور الحلبة، بينما المعاملة الرابعة غذيت على العليقة الأساسية مضافاً إليها ٢٠٠ جم / جاموسة / يوم من مجروش بذور الحلبة. أشارت النتائج إلى أن الكميات المأكولة من العلف ارتفعت معنوياً عند (مستوى ٥%) في المعاملة الثالثة بالمقارنة بالمعاملات الأخرى. وإن إضافة مجروش بذور الحلبة أدت إلى زيادة معنوية (مستوى ٥%) في معاملات هضم مكونات الغذاء (DM, OM, CP and EE). كمية اللبن المنتج كانت ٨٠٦.٤، ٨٩٦، ٩٥٢ و ٩٠٧.٢ كجم. أيضاً متوسط إنتاج اللبن اليومي كان ٧.٢، ٨، ٨.٥ و ٨.١ كجم / رأس / يوم لكل من المعاملة الأولى والثانية والثالثة والرابعة على التوالي، وكذلك النسبة المئوية لسكر اللاكتوز في اللبن كانت مرتفعة معنوياً (مستوى ٥%) في الجاموس المغذى بإضافة مجروش بذور الحلبة. ولكن نسبة الدهون في اللبن إنخفضت معنوياً (مستوى ٥%) في الجاموس المغذى بإضافة مجروش بذور الحلبة. وكانت كفاءة تحويل العليقة المأكولة إلى لبن مرتفعة معنوياً (مستوى ٥%) في الجاموس المغذى بإضافة مجروش بذور الحلبة. وظهرت النتائج أيضاً أن إضافة مجروش بذور الحلبة إلى علائق الجاموس الحلاب أدت إلى زيادة معنوية (مستوى ٥%) في مستوى هرمون البرولاكتين وكذلك مستوى ال-GPT في بلازما الدم. يمكن استنتاج أن إضافة بذور الحلبة إلى علائق الجاموس الحلاب معدل ١٠٠ و ١٥٠ و ٢٠٠ جم / رأس / اليوم أدى الرفع الكفاءة الاقتصادية بنحو ٦.٦، ٣.٩٥ و ٧.٨٩٪ على التوالي، ويمكن نوصي به لتحسين كفاءة الأعلاف، وإنتاج الحليب والكفاءة الاقتصادية.