EFFECT OF SUPPLEMENTING FENUGREEK SEEDS AS GALACTAGOGUE ON PERFORMANCE OF LACTATING EWES

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(Received 10/5/2004, accepted 22/7/2004)

SUMMARY

Thirty Barki ewes 2-3 years of age and 45.5 kg live body weight (LBW) at last four weeks of gestation were divided into three similar groups (10 ewes in each). The first group (control group) (T1) was fed a basal diet, which contain 0.9 kg concentrate feed mixture (CFM), 2.0 kg berseem and 250 g rice straw. The second and third groups (T2 (F20)&T3 (F40)) were fed basal diet supplemented with 20 or 40 g ground fenugreek seeds (GFS)(*Trigonella foenum-graecum*), respectively. At the same time Three-digestibility trails were carried out using twelve mature Barki rams average 52.6 kg LBW. Animals were randomly divided into three groups (4 animals each) and fed the same ewes diets to determined the effect of supplementing GFS on the digestibility and nutritive value of basal diet.

The results of digestibility trials indicated that total dry matter intake (DMI) was increased with the first supplementation level (20 g/h/d), whereas decreased in the second supplementation level (40 g/h/d). High level of GFS supplement (40 g/h/day) improved the digestibility of DM, OM, CP and NFE. Moreover adding GFS increased the EE digestibility. On the other hand, adding GFS decreased the CF digestibility. Also, results indicated that adding GFS tended to improve the nutritive value of basal diet.

The results of feeding trial indicated that weaning weight and average daily gain (ADG) of suckling lambs were improved by adding GFS. Also, milk yield, 4% fat corrected milk (FCM) and feed efficiency were improved by adding GFS. It is of interest to note, that chemical composition of milk was unaffected significantly by adding GFS, except for fat %, which decreased by adding GFS. On the other hand fat yield, protein yield and total solid yield were increased by GFS supplements. The results of blood analysis indicated that adding GFS significantly increased blood serum albumin, but blood serum cholesterol concentration was significantly decreased. On the other hand, serum total proteins, globulin, A/G ratio, GOT, GPT, Urea, total lipids, triglyceride were unaffected by adding GFS. Also, adding GFS non-significantly decreased triiodothyronin and tetraiodothyronin activity, which were determined by nuclear technique.

Keywords: *Fenugreek seeds, Trigonella foenum-graecum, Milk production, Digestibility trail, Feeding trial, Lactating ewes, Weaning weight, Blood analysis*

INTRODUCTION

Increasing of milk yield for lactating ewes is an important factor for the production of robust lambs at weaning. Many researchists used chemical supplements, hormones and minerals for increasing milk production. Also, bovine somatotropins administered to healthy dairy animals are reported to increase the milk production (Ludri, 1993), but this treatment is very expensive and the milk from treated cattle may not be safe for human consumption (Kronfeld, 1989).

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Many ancient and modern Egyptian women are using the fenugreek seeds to increase milk secretion (Basha et al. 1987). The use of herbal galactogogues is known to have beneficial effect on milk production (Singh et al., 1991; Tiwari et al., 1993) Also, the World Health Organization (WHO) encourages using medicinal herbs and plants to substitute or minimize the use of chemicals through the global trend to go back to nature.

Carol, et al. (1996) reported that fenugreek seeds are non-toxic and haven't side effect. Also, Abo EL-Nor (1999) found that adding fenugreek seeds to buffaloes diets increased the milk production. Moreover, Allam, et al. (1999) and Kholif (2001) found that milk yield and fat corrected milk yield were increased by addition of fenugreek seeds in goat rations.

The objective of the present study was to determine the effect of ground fenugreek seeds supplements to the basal diets on performance of nursing ewes and suckling lambs and composition of milk produced.

MATERIALS AND METHODS

This study was carried out at the Experimental Agricultural project (sheep farm) and animal nutrition research unit, radiobiology applications department, Nuclear Research Center, Atomic energy Authority, Abu Zabeel to investigate the effect of supplementing ground fenugreek seeds to the basal diet on performance of lactating ewes.

A- Feeding trial:

1- Animals and feeding

Thirty Barki ewes at 2-3 years old and 45.5 kg live body weight (LBW) at the last four weeks of gestation were divided into three equal groups (10 ewes in each). The first group (control group) (T1) was fed a basal diet (table1) which contained 0.9kg concentrate feed mixture (CFM), 2.0 kg berseem and 250 g rice straw. The second and third groups (T2 (F20) and T3 (F40)) were fed basal diet supplemented with 20 or 40 g ground fenugreek seeds (GFS), respectively. The diets were offered according to Tommi allowances (1963) for fat-tailed coarse wool sheep. The daily ration was offered in two portions at 9.00 and 15.00 hr. Fresh water was available all the day.

2- Weight of lambs

After lambing, lambs were weighted weekly from birth to weaning until 60 days of age.

3- Recording of milk production and composition of milk

Starting from the end of the first week, the lambs were isolated out of their dams after the second meal at 15.00 hr till the next day. The ewes were completely hand milked till stripping on the next day morning and milk yield was recorded. Milk samples were analyzed for fat, total solid (TS), solid not fat (SNF), total proteins (TP) and ash according to methods of (ling, 1963), lactose was calculated by difference.

4- Sampling and analysis of blood serum

Biweekly blood samples were directly collected from Jugular vein into vacuum tube before morning feeding. The vacuum tube was centrifuged at 3000 rpm for 15 min, and then blood serum was separated into polypropylene tube and stored at -18°c until analysis. Serum total proteins were determined as described by (Armstrong and Carr 1964), Albumin (Doumas *et al,* 1971), Urea (Patton and Crouch, 1977), transaminases, GOT and GPT activities

(Reitman and Frankel, 1957), Cholesterol (Allain et al., 1974), . triglycerides (Schalm, et al. 1975), serum total lipid (Postma and Stroes (1968), Globulin and Albumin globulin ratio (A/G ratio) were calculated.

Triiodothyronin (T3) and Tetraiodothyronin (T4) were determined by Radioimionoassy (RIA) using solid phase coated tubes and the tracer was labeled with ^{125} I (Diagnostic Products Corporation, Los Angeles, USA).

B- Digestibility trial:

Three-digestibility trails were carried out using twelve mature Barki rams average 52.6 kg LBW. Animals were randomly divided into three groups (4 animals each) and fed the same ewes diets to determined the effect of supplementing GFS on the digestibility and nutritive value of basal diet.

Each animal was offered daily 750 g CFM, 1.6 kg berseem and 200 g rice straw for four weeks as adaptation period. The animals were placed on metabolic cages for 10 days as preliminary period followed by 7 days for quantitative collection of feces. A daily sample representing 10 % by weight of fresh feces from each animal was oven dried at 60°c for over-night after sprayed it with 10% v/v H_2SO_4. Dried fecal samples were ground in hammer mill through 1mm diameter screen. Chemical composition of feed refusals and feces were analyzed according to A.O.A.C. (1996).

C- Statistical analysis:

Data of milk yield and milk composition obtained from this study were statistically analyzed according to SAS, (1996), procedure.

$Yijkl = U + Ti + a(T)ij + WK + Eijkl$

Where:

Yijkl = Parameter under analysis, U = Overall mean, Ti = The fixed effect of treatment when (i) = 1,2,3 , a (T)ij = the random effect of animal j nested within treatment (i), WK = the fixed effect of week when k = 1,2,….,8, Eijkl = random error. Also, data of digestibility trail and performance of lambs were analyzed according to (Snedecor and Cochran 1980), means were tested for differences using Duncan's multiple range test (Duncan, 1955).

RESULS AND DISCUSSION

1- Digestibility trial:

Results of digestibility trial are shown in table (2). Data indicate that total dry matter intake (DMI) tended to increase with the first supplementation level (20 g/h/d) whereas decreased with the second supplementation level (40 g/h/d), but the differences were not significant ($p<0.05$). It is of interest to note that, the first supplementation level (20 g/h/day) non- significantly increased DMI as g /$kg^{0.75}$ by 2.3%, but decreased to 4.4 % with the second supplementation level (40 g/h/day). Allam, et al. (1999) found that total DMI was increased when adding 500 mg fenugreek seeds /kg LBW, which equal to the 20 g/h/d in the present study. Also, Abo El-Nor (1999) found that DMI as g/kg LBW was increased from 23.4 for control treatment to 23.7 when supplementing fenugreek seeds to the diet of lactating buffaloes at level of 100 g/h/d. However increasing the supplement to 200 g/h/d the DMI was limited to 23.6 g/kg LBW. Data in table (2) showed that high level of GFS tended to improve the digestibility of DM, OM, CP and NFE but the difference was not significant ($p<0.05$). On the other hand, the CF digestibility was decreasing by 10.7 and 15.4 % for first and second

Table (1) : The formulation of concentrate feed mixture (CFM), and the proximate analysis of ingredients of the rations.

Item	CFM %	Berseem	Rice straw	Fenugreek seeds
Crushed yellow corn	50.0			
Sugar beet pulp	20.0			
Undecorticated cotton seed meal	15.0			
Soybean meal	4.4			
Wheat bran	9.0			
Common salt	0.5			
Mineral mixture	0.1			
Dicalcium phosphate	1.0			
Total	100.0			
Proximate analysis on DM basis				
Dry matter %	89.91	18.6	92.5	93.23
Organic matter %	94.77	86.31	81.03	95.92
Ash %	5.23	13.69	18.97	4.08
Crude protein %	15.42	14.76	3.14	27.0
Either extract %	2.04	2.62	2.05	8.80
Crude fiber %	8.84	36.28	34.05	8.82
Nitrogen free extract (NFE) %	68.47	32.65	41.79	51.29

Table (2) : Effect of supplementing ground fenugreek seeds on voluntary intake, nutrient digestibility and nutritive value.

Item	T1 (Control)	T2 (F 20)	T3 (F 40)	SE
No. of animal	4	4	4	--
Mean body weight (kg)	52.9	52.7	52.3	2.6
DMI from CFM (g/d)	626.2	637.5	622.2	39.2
DMI from berseem (g/d)	135	134.7	98.7	9.5
DMI from rice straw (g/d)	76	81.8	72.2	5.6
Total DMI* (g/d)	837.2	854.0	793.1	8.4
DMI g/ $kg^{0.75}$	42.67	43.66	40.8	3.7
Percentage of apparent digestibility %				
DM	77.54	76.61	77.87	2.5
OM	79.93	78.83	80.10	2.9
CP	68.99	69.89	72.20	1.9
CF	60.50	54.03	51.21	2.3
EE	64.35 ^{b}	75.82 ^{a}	72.20 ^{a}	2.7
NFE	88.2	87.36	88.71	3.2
Ash	49.67	50.19	49.10	2.8
Percentage of Nutritive value %				
TDN	74.89	74.36	76.03	3.7
DCP	9.79	10.26	10.73	1.1

Means in the same row having different superscripts per each item differ significantly (P<0.05), SE = Standard error.

supplementation level, respectively, which may be due to one or more of the following:

(a) GFS may contain some component that may affect the viability or activity of cellulolytic bacteria.
(b) GFS may contain some components, which may decrease the number of cellulolytic bacteria.
(c) Such supplement may increase Turnover rate of the digesta and consequently decrease the fiber digestion.

On the other hand, the digestibility of EE was significantly increased ($p<0.05$) with adding GFS. Also, data showed that adding GFS improved the nutritive value of basal diet. The results of TDN were 74.9, 74.4 and 76.0 for T1, T2 and T3, respectively and the data of DCP were 9.8, 10.3 and 10.7 for T1, T2 and T3, respectively. These results were in agreement with the results of Allam, et al. (1999) who reported that, EE digestibility was increased from 78.29% to 78.74% with adding fenugreek seeds, also the TDN and DCP were increased from 54.34 and 10.06 to 57.43 and 10.49 %, respectively.

2- Feeding trial:

2-1- Performance of lambs:

Data of table (3) show the performance of lambs suckling from ewes fed diet supplemented with different levels of GFS. The results indicate that increasing level of GFS increased the weaning weight of lambs, but the differences were not significant ($p<0.05$). It is of interest to not that average daily gain (ADG) was improved by 2.9 and 12.5 % for low and high level of GFS when compare to control treatment (T1). This parameter reflects indirectly the milk production during suckling period or lactation period (60 days).

2-2- Milk yield and milk composition:

Table (4) presents, DMI, mean milk yield, 4% FCM, and feed efficiency. Adding GFS was significantly ($p<0.05$) increased Mean milk yield, but the difference between the low and high level of GFS was not significant ($p<0.05$). Mean milk yield was improved by 11.4 and 14.1 % when discussed as g/h/day but improved by 11.8 and 13.4% when discussed as (g/ kg0.75) with supplementing GFS levels of 20 and 40 g/h/d, respectively. Also, 4% FCM was increased by 8.72 and 9.48% when GFS was added with same levels, but the differences between (T1 and T2) and (T2 and T3) were not significant ($p<0.05$). These results are in agreement with results of Abo EL-Nor (1999), who found that adding fenugreek seeds to lactating buffaloes diet with level of 100 and 200 g/h/d increased milk yield by 11.1 and 19.7%, respectively. Also, Allam, et al (1999), reported that adding fenugreek seeds to Zaraiby goat's ration with level of 500 mg/kg LBW increased milk production by 34%. Also, table (4) indicates that GFS supplements improved feed efficiency compared with control treatment. These results are in agreement with the results of Abo EL-Nor (1999), who reported that feed efficiency was improved with fenugreek seed supplements.

Results presented in table (5) indicate that high GFS supplements decreased significantly ($p<0.05$) the percentage of fat, but the differences between high and low levels and between control treatment and low level of GFS were not significant ($p<0.05$). Adding GFS resulted a decrease percentage of fat by 3.51 and 5.98% for 20 and 40 g/h/d, respectively. On the other hand adding

Table (3) : Performance of lambs suckling their dams fed ration with or without ground fenugreek seeds supplements.

Item	T1 (Control)	T2 (F 20)	T3 (F 40)
No. of lambs	10	10	10
Birth weight (kg)	4.07	4.24	3.88
Weaning weight (kg)	14.41	14.88	15.51
Average daily gain (g)	172	177	194

Table (4) : Performance of ewes fed ration with or without ground fenugreek seeds supplements.

Item	T1 (Control)	T2 (F 20)	T3 (F 40)	SE
No. of ewes	10	10	10	--
Weight of ewes (kg)	45.5	45.3	45.9	--
DMI g/h/day	1412	1431	1495	--
DMI g/ kg $^{0.75}$	81	82	85	--
Milk yield as g/h/day	394^{b}	439^{a}	450^{a}	9.59
Milk yield as g/ kg $^{0.75}$	22^{b}	25^{a}	26^{a}	1.80
Fat corrected milk (4%) as g/h/day	494^{b}	537^{ab}	541^{a}	13.56
Feed efficiency as g DMI / g milk yield	3.6	3.3	3.3	--
Feed efficiency as g DMI / g FCM	2.9	2.7	2.8	--

Means in the same row having different superscripts per each item differ significantly (P<0.05), SE = Standard error.

Table (5) : Milk composition and nutrient yield produced by ewes fed ration with or without ground fenugreek seeds supplements.

Item	T1 (Control)	T2 (F 20)	T3 (F 40)	SE
Fat %	5.69^{a}	5.49^{ab}	5.35^{b}	0.16
CP%	4.79	4.90	4.94	0.39
Ash%	0.99	0.97	0.97	0.25
Lactose%	5.35	5.46	5.11	0.24
T.S %	16.82	16.82	16.37	2.60
SNF %	11.13	11.33	11.02	1.43
		Nutrient yield per 60 days		
Fat yield (g)	1345^{b}	1445^{a}	1443^{a}	273
T.S yield (g)	3975^{b}	4428^{a}	4415^{a}	107
Protein yield (g)	1132^{b}	1290^{a}	1332^{a}	31

Means in the same row having different superscripts per each item differ significantly (P<0.05), SE = Standard error.

GFS did not change results of ash, lactose, T.S and SNF. These results agree with Abo EL-Nor (1999), who found that adding fenugreek seeds did not significantly affect neither SNF nor T.S content of buffalo's milk. Whereas, adding of GFS increased percentage of CP by 2.3 and 3.1% for low and high levels, respectively but the differences were not significant ($p< 0.05$). Moreover, Allam, et al. (1999) found that CP% of goat's milk was non-significantly increased with supplements of fenugreek seeds to goats ration.

Also, table (5) showed the nutrient yield from milk per 60 days (lactation or suckling period from birth to weaning of lambs). Results indicated that GFS supplements significantly increased fat yield, which increased from 1344.81 g/60 days to 1445.24 and 1442.99 g/60 days. Total solids yield was increased by 11.3 and 11.1% for T2 and T3 respectively, whereas fat yield increased by 7.5 and 7.3% for low and high levels, respectively. Protein yield was significantly ($p<0.05$) increased by 13.9 and 17.7% for T2 and T3, respectively when compare with T1. These results are comparable to Abo El-Nor (1999) and Allam, et al (1999) findings. Increasing milk yield and nutrient yield by adding of GFS may be due to that fenugreek seeds may contain some active substance stimulating hypothalamus to increase the releasing factor of prolactin hormone or stimulating directly the pituitary gland to increase their release from prolactin hormone leading to increase milk production. Also, Fig (1) showed the effect of GFS on milk yield. Moreover it is clear that GFS supplements increased the persistency of milk yield from third to six week of lactation when compare with control group.

2-3- Blood serum analysis:

Data of table (6) indicate that serum total proteins, globulin and A/G ratio were unaffected by adding GFS and these concentrations were in agreement with the concentrations reported by El-Ashry et al (2000) and Shoukry et al (2003). On the other hand, adding GFS significantly ($p<0.05$) increased albumin concentration. This result is in accordance with the result of protein yield. Also, Kaneko, et al (1999) found that, concentrations of total proteins and albumin in sheep were 72.0 ±5.2 and 33.0 ±3.9 g/L, respectively. Table (6) show that GOT, GPT, total lipids, triglycerides and urea concentration were not-significantly decreased by GFS supplements and the concentrations of GOT, GPT and urea were in agreement with the concentration reported by Jerry Kaneko, et al (1999). Also, adding GFS non-significantly decreased either triiodothyronin or tetraiodothyronin. On the other hand, cholesterol concentration was significantly decreased from 88.0 mg/dl to 63.96 and 61.89 mg/dl for T1, T2 and T3, respectively. Abo El-Nor (1999) found that plasma cholesterol values decreased by adding fenugreek seeds. Moreover, Sharma (1986) found that fenugreek seeds caused significant reduction of serum cholesterol in the rats. Also, Bhat, et al., (1985) reported that fenugreek seeds increased bile secretion and stimulated conversion of cholesterol to bile salts. In addition table (6) show that Triiodothyronine and tetraiodothyronine were not-significantly decreased by GFS supplements. These levels were within the normal range of Hammam (2001), who reported that Triiodothyronine level for Barki ewe lambs at 11.5 months of age was 156.25 ng/dl while Tetraiodothyronine level was 5.63 µg/dl. Also, Aswari, et al. (1999) found That Tetraiodothyronine level for

Table (6) Effect of feeding ration with or without ground fenugreek seeds supplements on some blood parameters of lactating ewes.

Item	T1 (Control)	T2 (F 20)	T3 (F 40)	SE
Total protein (g/dl)	7.13	7.49	7.59	0.84
Albumin (g/dl)	3.26 [b]	3.82 [a]	3.79 [a]	0.14
Globulin (g/dl)	3.87	3.67	3.80	0.70
A/G ratio	0.91	1.21	1.05	0.22
GOT (U/l)	42.59	41.43	40.30	1.66
GPT (U/l)	42.21	42.20	37.18	3.15
Urea (mg/dl)	37.26	33.21	32.75	4.21
Cholesterol (mg/dl)	88.00[a]	63.96[b]	61.89[b]	7.65
Total lipid (g/L)	3.90	3.87	3.40	0.56
Triglycerides (mg/dl)	30.74	24.78	23.95	3.28
T3 (ng/dl)	151.99	122.37	104.91	18.96
T4 (µg/dl)	5.25	4.85	4.78	0.28

Means in the same row having different superscripts per each item differ significantly (P<0.05), SE = Standard error.

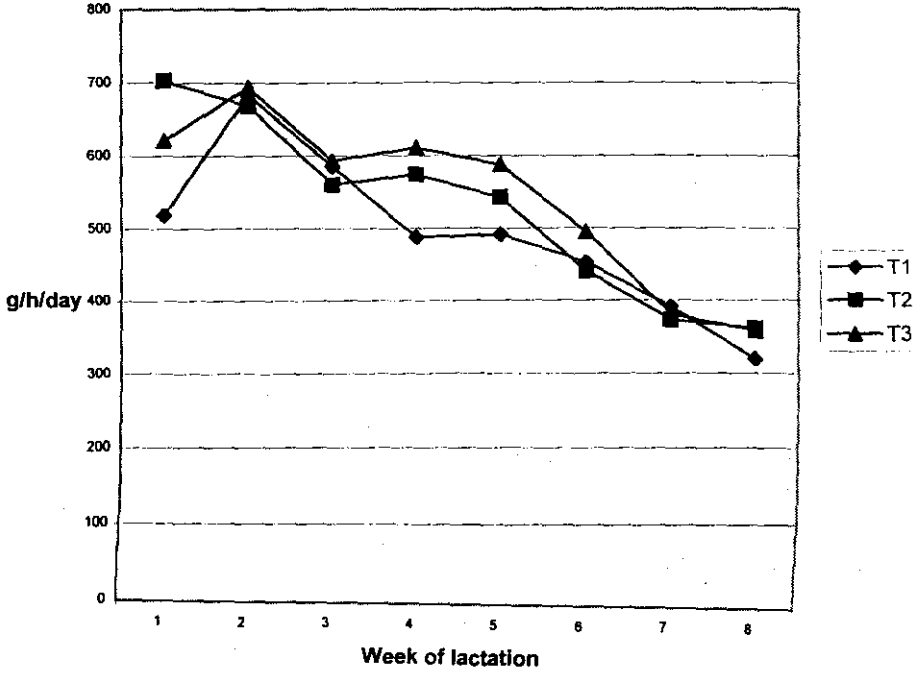

Fig (1) : Effect of ground fenugreek seeds supplement on (4% FCM) ewes milk yield

Madras red sheep at 2-3 years of age was 5.96 ± 0.16 µg/dl, whereas Triiodothyronine level was 0.84 ± 0.05 ng/ml.

CONCLUSION

From the previous results it could be concluded that supplementing ewe's diet with GFS tended to improve the nutrient digestibility and nutritive value but deceased the CF digestibility. Also, increased the ADG of lambs, which is reflecting on the weight of lambs at weaning. Moreover, GFS supplements increased milk yield, fat yield, total solid yield and protein yield, also increased serum albumin concentration and decreased the serum cholesterol concentration.

Further studies are required to investigate the effect of GFS supplements on:

a- Rumen turnover rate and microbial protein synthesis.

b- Its effects on the number of cellulolytic bacteria and protozoa.

c- To investigate active substances which increase the milk production and decrease the serum cholesterol concentration.

Acknowledgment

Appreciation is expressed to Dr./ Mona A. Osman researcher of Animal Breeding at Department Of Sheep and Goat Research, Animal Production Research Institute, Ministry of Agricultural) for statistical analysis of present study.

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تأثير اضافة بذور الحلبة كمدرات للبن على آداء النعاج الحلابة

هشام منير صالح

قسم التطبيقات البيولوجية، مركز البحوث النووية، هيئة الطاقة الذرية، مصر

استخدم فى هذه الدراسة ثلاثون نعجة برقى متوسط اعمارها ٢-٣ سنة ومتوسط اوزانها ٤٥,٥ كجم فى المرحلة الأخيرة من الحمل(آخر اربع اسابيع) وزعت عشوائيا الى ثلاث مجموعات متماثلة (عشرة نعاج لكل مجموعة) غذيت المجموعة الأولى (الشاهد) على العليقة الأساسية التى تكونت من ٩٠٠ جم مخلوط علف مركز، ٢٠٠٠ جم برسيم و ٢٥٠ جم قش ارز. غذيت المجموعة الثانية والثالثة على نفس العليقة الأساسية مع اضافة ٢٠ او ٤٠ جم بذور حلبة مطحونة على التوالى وذلك لدراسة اثر اضافة بذور الحلبة المطحونة على الأداء الانتاجى للنعاج وحملانها . اجريت فى نفس الوقت ثلاث تجارب هضم باستخدام اثنى عشر كبش برقى متوسط اوزانها ٥٢,٦ كجم وزعت عشوائيا الى ثلاث مجموعات(اربعة لكل مجموعة) غذيت على الثلاث علائق سابقة الذكر لدراسة اثر اضافة بذور الحلبة المطحونة على معاملات الهضم للمركبات المختلفة والقيمة الغذائية للعليقة الأساسية.

اظهرت نتائج تجربة الهضم ان المادة الجافة المأكولة لم تتأثر معنويا بأضافة بذور الحلبة المطحونة، وذلك بالرغم من ارتفاعها مع مستوى الاضافة الأول(٢٠جم حلبة) عن المجموعة الشاهد ثم انخفاضها عن المجموعة الشاهد مع مستوى الاضافة الثانى (٤٠ جم حلبة). ايضا وجد ان اضافة بذور الحلبة المطحونة قد حسن بدرجة غير معنوية معامل هضم كل من المادة العضوية والبروتين الخام والمستخلص الخالى من الأزوت فى حين وجد ان معامل هضم الألياف الخام قد انخفض (غير معنوى) باضافة بذور الحلبة المطحونة. وجد ان معامل هضم المستخلص الايثيرى قد ارتفع معنويا باضافة بذور الحلبة المطحونة، فى حين ان التحسن فى القيمة الغذائية كمركبات كلية مهضومة و بروتين مهضوم لم يكن تحسنا معنويا.

كما اظهرت نتائج تغذية النعاج ان معدل الزيادة اليومى فى وزن الحملان الرضيعة قد زاد باضافة بذور الحلبة المطحونة والذى بدوره ادى الى زيادة وزن الحملان عند الفطام حيث كان متوسط اوزان الحملان عند الفطام (٦٠ يوم) ١٤,٤١، ١٤,٨٨ و ١٥,٥١ كجم لكل من المجموعة الشاهد ومستوى الاضافة الأول والثانى على التوالى. ايضا وجد ان انتاج اللبن وانتاج اللبن المعدل ومعدل تحويل الغذاء قد تحسن باضافة بذور الحلبة المطحونة. كما وجد ان التحليل الكيماوى للبن لم يتأثر معنويا باضافة بذور الحلبة المطحونة باستثناء نسبة الدهن فى اللبن حيث وجد انها انخفضت معنويا باضافة بذور الحلبة المطحونة على الرغم من ذلك وجد ان الأنتاج الكلى من الدهن والبروتين والمواد الصلبة خلال ٦٠ يوم قد زادت معنويا باضافة بذور الحلبة المطحونة. اظهرت تحليلات سيرم الدم ان البيومين سيرم الدم قد زاد معنويا باضافة بذور الحلبة المطحونة فى حين ان كوليستيرول الدم قد انخفض معنويا. كما وجد ان كل من بروتينات الدم والجلوبيولين والانزيمات الناقلة لمجموعة الأمين و اليورياواللبيدات الكلية والجليسريدات الثلاثية لم تتأثر معنويا باضافة بذور الحلبة المطحونة. ايضا وجد ان هرمونات الغدة الدرقية والتى قدرت بطرق المناعة الاشعاعية قد انخفضت انخفاض غير معنوى باضافة بذور الحلبة المطحونة.