UTILIZATION OF CORIANDER SEEDS AS A FEED ADDITIVE IN THE RAHMANI LAMBS RATION

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SUMMARY

Twenty-eight growing Rahmani male lambs aged 6-7 months and averaged 27.52 kg live body weight were divided into four similar groups (7 animals in each) and fed randomly on one of the following rations: R1 composed of 50% concentrate mixture (CM) plus 50% berseem hay (BH) without feed additives (control), while rations 2, 3 and 4 were composed of R1 (control) plus 2, 4 and 6 g coriander seeds (*Coriandum sativum L.*) / head / day, respectively. At the end of feeding trial, twelve animals were used in four digestibility trials to evaluate the experimental rations using acid insoluble ash (AIA) technique. Rumen liquor and blood samples were collected at the end of the experimental period. Results indicated that digestion coefficients of all nutrients (except EE) and nutritive values (expressed as TDN, DCP and ME) for R3 and R4 were higher ($P<0.05$) than those for R1 (control) and R2. The concentration of NH_3-N was lower ($P<0.05$) while, the concentration of total VFA's was higher ($P<0.05$) in the rumen liquor of animals fed R3 and R4 than those for animals fed R1 (control) and R2. The concentrations of hemoglobin, total serum proteins, albumin and globulin were higher ($P<0.05$), while the concentration of serum cholesterol was lower ($P<0.05$) in the blood of lambs fed R3 and R4 than those fed R1 and R2. In the feeding trial. The TDN and DCP intake for animals fed the rations 2. 3 and 4 improved by 5.4, 20.3 and 20.5 %; and 4.2, 22.0 and 21.2 %, respectively comparing with those fed the control ration. The average daily gain ($P<0.05$), feed conversion and economical efficiency improved, while feed cost decreased by adding coriander seeds (CS) in the rations.

Key words: coriander seeds, lambs, digestibility, rumen fermentation and performance.

INTRODUCTION

Feed additives are a most important part of nowadays animal production, especially when the animals are housed in large numbers in limited spaces. Many of the used additives are classed as drugs, all drugs used in animal production are under some degree of control by the Food and Drug Administration (FDA), which must approve a feed additive for use before it can be used at the commercial level on a routine basis (Church, 1988). However, the use of chemical products especially antibiotics may cause unfavorable side effects. On the other hand, attempts to use the natural materials as alternative growth promoters such as medicinal plants are widely accepted. Moreover, some studies indicated that the using of medicinal herbs and plants as feed additives for ruminants can improved rumen activity, nutrient digestibility, nutritive value, live body weight gain and feed efficiency with cows (Aboul-Fotouh et al., 1999 and El-Saadany et al., 2001) and sheep (Maged, 2004; Ali et al, 2005; and Mohamed et al., 2005).

Samlal et al. (2004) reported that coriander at a dose of 1 g/kg body weight reduced cholesterol and triglycerides levels in both synthesis and excretory phases in rats. Zein, (2006) also found that diabetic rats fed on coriander seeds and their aqueous extract had a significantly lower serum total cholesterol compared with the diabetic control.

The objective of this study was to evaluate effects of using different levels from coriander seeds as feed additive on the productive performance of Rahmani lambs.

MATERIALS AND METHODS

This study was conducted at a private farm belong to El-Hamol city, Kafr El-Sheikh Governorate and the Department of Animal Production, Faculty of Agriculture, Kafr El-Sheikh University, Egypt.

Feeding trial was conducted by using twenty-eight growing Rahmani male lambs aged 6-7 months and averaged 27.52 kg live body weight. The animals divided into four similar groups (7 animals in each). The feeding trial lasted 105 days and lambs were fed according to the allowances of growing lambs recommended by NRC (1985). The lambs were fed randomly on one of the following

rations: R1 composed of 50% concentrate mixture (CM) plus 50% berseem hay (BH) without feed additive (control), while rations 2, 3 and 4 were composed of R1 (control) plus 2, 4 and 6 g coriander seeds (CS) / head / day, respectively.

Lambs were fed CM and BH twice daily in almost two equal portions at 8.0 a.m. and 4.0 p.m. where coriander seeds was mixed with CM. Fresh water was available at all times. Lambs were weighed (before the morning feeding) at the beginning and at the end of the experimental period on 2 consecutive days; and once bi-weekly during the experimental period.

Concentrate mixture manufactured at the company of El-Gohary at Kafer El-Sheikh city and composed of 28.0% undecorticated cotton seed meal, 30.0% yellow corn, 25.0% wheat bran, 15.0% rice bran, 1.0% limestone, 0.5% common salt and 0.5% minerals mixture.

Four digestibility trails were carried out to determine the digestion coefficients and nutritive values of the experimental rations using twelve animals with an average live body weight of 45.8 kg. (3 animals from each group) at the end of the feeding trial. Collection period lasted 7 days, feces samples were collected twice daily during the collection period. Actual feed intake and excreted feces for each lamb in the four digestibility trials were recorded. Nutrient digestibilities were determined using acid insoluble ash (AIA) technique as described by Van Keulen and Young (1977). Composite samples of feeds and feces were analyzed according to A.O.A.C. (1990). Animals were given the different experimental rations to cover their requirements according to NRC (1985). Each animal was given daily diets individually.

Rumen liquor samples were obtained using a stomach tube from all animals at 4 hrs. after the morning feeding. samples were strained through two folds of cheesecloth. The pH values were immediately measured by Beckman pH meter. The ruminal ammonia-nitrogen (NH3-N) was determined according to A.O.A.C. (1990). While, The total volatile fatty acids (TVFA's) concentration was determined according to Warner (1964).

At the same time of rumen liquor collection. blood samples were taken from the jugular vein. Blood serum was separated within one hour and analysis for glucose according to Trinder

(1969). Total protein was determined according to Henry et al. (1974). While, albumin was assayed according to the method of Doumas et al.(1971). Estimation of globulin was done by subtracting albumin values from total protein values. AST, ALT activities and cholesterol concentration were estimated according to the methods described by Varley (1976). Blood hemoglobin (Hb) concentration was determined according to the method of Drabkin (1932). Estimation of all blood constituents were done calorimetrically using commercial kits.

Data were statistically analyzed using General Models Procedure (one way ANOVA model) adapted by SPSS (1997). While, differences among treatment means were tested by multiple range test of Duncan (1955).

RESULTS AND DISCUSSION

Chemical composition of feed ingredients and the control ration:

The chemical composition of the concentrate mixture (CM), berseem hay (BH), coriander seeds (CS) and the control ration (R1) is shown in Table (1). The chemical composition values for CM and BH agree with those reported by Mohamed and El-Saidy (2003), El-Ashry et al. (2004), and Saleh et al. (2005).

Table 1: Chemical composition (%) of concentrate mixture, berseem hay, coriander seeds and the control ration.

Item	CM	BH	CS	R_1 (control), calculated
DM	92.70	90.38	91.13	91.54
On DM basis				
OM	92.70	89.05	94.22	90.88
CP	15.45	13.35	12.94	14.40
CF	11.04	25.92	27.87	18.48
EE	3.68	2.01	14.67	2.85
NFE	62.53	47.97	38.74	55.25
Ash	7.30	10.95	5.78	9.12

CM: concentrate mixture. BH: berseem hay. CS: coriander seeds.
R_1: 50% concentrate mixture (CM)+50% berseem hay (BH) without additive.

Also, data in Table (1) show that coriander seeds contained 94.22 % OM, 12.94 % CP, 27.87 % CF, 14.67 % EE, 38.74 % NFE and 5.78 % ash (on DM basis). These results agree with those reported by Farrell (1990), Abd El-Rahim et al. (2001) and Zein (2006). They found that the chemical composition of coriander seeds (on DM basis) ranged from 11.15 to 13.43 % for CP, from 23.57 to 29.10 % for CF, from 14.13 to 15.39 % for EE, from 37.71 to 45.07 % for NFE and from 4.82 to 6.28 % for ash. However, Zein (2006), reported that coriander seeds were rich in certain minerals (calcium, phosphorus, potassium, sodium, iron, zinc, copper and manganese), their concentrations were 608.1, 173.0, 1026.1, 32.2, 16.7, 5.3, 4.6 and 1.6 mg/100g DM, respectively.

DM intake, digestion coefficients and nutritive value:

Results in Table (2) show that the DM intake increased from 1480 g/h/d for R_1 (control) to 1504, 1568 and 1558 g/h/d for R_2, R_3 and R_4, respectively, but the differences were not significant. Digestion coefficients of DM, OM, CP, CF and NFE for R_3 and R_4 were significantly ($P<0.05$) higher than those for R_1 (control) and R_2. While, the differences in the digestion coefficients of EE among the four rations were not significant. Moreover, nutritive values as TDN, DCP and ME were significantly ($P<0.05$) higher with lambs fed R_3 and R_4 than those fed R_1 (control) and R_2. The improvement of nutritive value with coriander seeds supplementation (R_3 and R_4) may be due to the increase in the digestion coefficients of most nutrients in these rations. These results are in harmony with those observed by Mohamed et al. (2003), who reported that the digestion coefficients of all nutrients, except EE, were significantly ($P<0.05$) improved by adding Nigella sativa (NS), Matricaria chamomile (MC) and Rosemarinus officinalis (RO) to diets of sheep. Also, all feed additives tested improved significantly ($P<0.05$) the nutritive value as TDN, SE and DCP than the control group. Zeid and Ahmed (2004) found that adding chamomile in buck rations increased ($P<0.05$) nutrient digestibilities and nutritive values (as TDN and DCP) of the treated rations compared to the control. However, Ali et al. (2005) reported that nutrient digestibilities of all nutrients (except of EE) and nutritive values (as TDN, DCP and ME) were increased ($P<0.05$)

by adding chamomile flowers to lambs rations compared to the control group.

Table 2: Digestion coefficients and nutritive value of the experimental rations.

Item	Experimental rations				SEM
	R_1	R_2	R_3	R_4	
DM intake, g/head/day					
CM	740	751	782	776	
BH	740	751	782	776	
CS	0	2	4	6	
Total DM intake, g.	1480	1504	1568	1558	1.24
Digestion coefficients, %					
DM	55.82^{b}	56.32^{b}	65.25^{a}	64.95^{a}	1.02
OM	57.99^{b}	59.05^{b}	68.83^{a}	69.01^{a}	1.21
CP	61.15^{b}	61.99^{b}	70.45^{a}	69.82^{a}	1.09
CF	46.52^{c}	49.72^{b}	56.21^{a}	57.39^{a}	0.95
EE	69.85	70.51	70.98	71.75	1.37
NFE	66.29^{b}	67.95^{b}	75.12^{a}	74.85^{a}	0.88
Nutritive value, %					
TDN	58.51^{b}	60.18^{b}	66.59^{a}	66.62^{a}	1.45
ME, Mcal/kg DM	2.11^{b}	2.17^{b}	2.40^{a}	2.40^{a}	1.28
DCP	8.81^{b}	8.93^{b}	10.14^{a}	10.05^{a}	1.15

^{a,b,c} means in the same row with different superscripts differ significantly at ($P<0.05$).
R_1: 50% concentrate mixture (CM)+50% berseem hay (BH) without additive.
R_2, R_3 and R_4: R_1+2, 4 and 6 g coriander seeds (CS) /head/day, respectively.
SEM: Standard error of mean.
ME, Mcal/kg DM=(TDN×3.6)/100 (Ranjhan, 1980; and Church and Pond, 1982).

Rumen activity:

Data of rumen activity of animals fed the experimental rations are presented in Table (3). Results showed that coriander seeds supplementation in the animals rations did not significantly affect ruminal pH values. These data agree with the results obtained by Youssef et al.(1998), Allam et al.(1999), Mohamed et al. (2003) and Ali et al.(2005), who found that the pH value of rumen liquor did not significantly influence by medicinal plants supplementation. Data show also that, the concentrations of NH_3-N were significantly ($P<0.05$) lower, while the concentrations of total

VFA's were higher in the rumen liquor of animals fed R_3 and R_4 than those for animals fed R_1 (control) and R_2. These results are in harmony with the findings obtained by Mohamed et al. (2003), Maged (2004) and Ali et al. (2005), who reported that ammonia-N concentration decreased ($P<0.05$) while, total VFA's concentration increased ($P<0.05$) in rumen liquor of sheep fed rations supplemented with some medicinal plants.

Table 3: Some rumen liquor parameters of lambs as affected by coriander seeds supplemented rations.

Item	Experimental rations				SEM
	R_1	R_2	R_3	R_4	
pH	6.04	6.11	5.91	5.89	0.14
NH_3-N, mg/100ml	29.12^a	28.95^a	23.01^b	24.35^b	0.23
TVFA's, meq/100ml	12.05^b	12.81^b	15.05^a	16.01^a	0.17

^{a,b,} means in the same row with different superscripts differ significantly at ($P<0.05$).
R_1: 50% concentrate mixture (CM)+50% berseem hay (BH) without additive.
R_2, R_3 and R_4: R_1+2, 4 and 6 g coriander seeds (CS) /head/day, respectively.
SEM: Standard error of mean.

Blood parameters:

Data of the effect of coriander seeds supplementation on some blood parameters are displayed in Table (4). The concentrations of hemoglobin, total serum proteins, albumin and globulin were significantly higher ($P<0.05$), while the concentration of serum cholesterol was significantly lower ($P<0.05$) in the blood of lambs fed R_3 and R_4 than those fed R_1 and R_2. No significant differences were observed among the four experimental rations in the blood glucose concentrations and enzymes activity as AST and ALT. While, the values of AST and ALT in serum blood of lambs fed R_3 and R_4 were slightly decreased by increasing the level of coriander seeds comparing with R_1 and R_2. These results are in agreement with the findings of Shehata et al. (2004) with goats, Maged (2004) and Ali et al., (2005) with sheep. They reported that total plasma proteins. albumin, globulin and hemoglobin concentrations were increased, while cholesterol concentration and AST and ALT activity were decreased by the addition of chamomile in the rations. In the same

trend, Eskander and Jun (1995) and Zein (2006) observed that diabetic rats fed on coriander seeds or and their aqueous extract had a significantly lower serum total cholesterol concentration compared with the diabetic control.

Table 4: Some blood parameters of lambs as affected by coriander seeds supplemented rations.

Item	Experimental rations				SEM
	R_1	R_2	R_3	R_4	
Hemoglobin, g%	9.88^b	10.25^b	12.95^a	12.74^a	0.31
Glucose, mg/100ml	49.82	50.89	51.43	50.87	0.56
Total protein,g/100ml	5.95^b	6.15^b	7.95^a	7.75^a	0.11
Albumen, g/100ml	3.39^b	3.71^b	4.51^a	4.61^a	0.09
Globulin, g/100ml	2.56^b	2.44^b	3.44^a	3.14^a	0.21
ALT, IU/L	16.72	17.01	15.95	16.08	0.65
AST, IU/L	35.75	36.05	34.71	35.03	0.89
Cholesterol, mg%	123.23^a	117.95^a	98.12^b	99.57^b	2.25

^{a,b} means in the same row with different superscripts differ significantly at ($P<0.05$).
R_1: 50% concentrate mixture (CM)+50% berseem hay (BH) without additive.
R_2, R_3 and R_4: R_1+2, 4 and 6 g coriander seeds (CS) /head/day, respectively.
SEM: Standard error of mean.

Growth performance, DM intake and feed conversion :

Data presented in Table (5) show that DM, TDN and DCP intake increased by increasing the level of CS in the rations of lambs. The DM, TDN and DCP intake for animals fed R_2, R_3 and R_4 improved by 2.4, 5.7 and 5.8 %; 5.4, 20.3 and 20.5 %; and 4.2, 22.0 and 21.2 %, respectively comparing with those fed the control (R_1). While, the average daily gain (ADG) were significantly ($P<0.05$) higher for lambs fed R_3 and R_4 (189 and 191 g/h/d, respectively) than those for lambs fed R_1 (control) and R_2 (144 and 156 g/h/d, respectively). These results indicated that ADG improved by 23.8 and 24.6 % for lambs fed R_3 and R_4, respectively compared with those fed the control ration. Improving ADG for lambs fed R_3 and R_4 may be due to increasing of their feed units intake as TDN and DCP compared to those fed R_1 (control) and R_2.

Concerning feed conversion of the experimental rations (Table 5), the feed conversion was improved by 5.5, 19.5 and 20.2

% by adding CS (for R_2, R_3 and R_4, respectively) comparing with those fed the control ration.

These results are in agreement with the findings of Singh and Taparia (1992) who conducted feeding trials with heifers, and found that cymbopogon supplemented diets improved daily body weight gain. Moreover, Aboul-Fotouh et al. (1999) reported that lambs daily gain was improved by adding the medicinal herbage (Achillea millefolium, Cymbopogon citrates and leaves of Eucalypts globules) to the diet. Also, Soliman et al. (1995) observed improvement in feed conversion by rabbits when they used commercial natural additives including some medicinal herbage. In the same trend, Maged (2004) and Ali et al. (2005) reported that adding chamomile flower (2 g/h/d) to ration of Rahmani and Barki lambs, respectively increased ($P<0.05$) ADG and improved feed conversion efficiency.

Table 5: Lambs performance as affected by coriander seeds supplemented rations.

Item	Experimental rations				SEM
	R_1	R_2	R_3	R_4	
Growth performance:					
Initial body weight, kg.	27.49	27.42	27.62	27.55	0.21
Final body weight, kg.	42.61^b	43.80^b	47.83^a	48.03^a	0.43
Total gain, kg.	15.12^b	16.38^b	20.21^a	20.48^a	0.61
Daily gain, g.	144^b	156^b	189^a	191^a	0.96
DM intake, g/head/day:					
Concentrate mixture (CM)	671	686	707	707	---
Berseem hay (BH)	671	686	707	707	---
Coriander seeds (CS)	0	2	4	6	---
Total DM intake, g.	1342	1374	1418	1420	---
TDN intake, g/head/day:	785	827	944	946	---
DCP intake, g/head/day:	118	123	144	143	---
Feed conversion:					
kg DM/kg gain	9.319	8.808	7.503	7.435	---

^{a,b} means in the same row with different superscripts differ significantly at ($P<0.05$).
R_1: 50% concentrate mixture (CM)+50% berseem hay (BH) without additive.
R_2, R_3 and R_4: R_1+2, 4 and 6 g coriander seeds (CS) /head/day, respectively.
SEM: Standard error of mean.

Feed cost and economical evaluation:

Results of feed cost and economical evaluation of the experimental rations are shown in Table (6). The addition of CS to the rations (R_2, R_3 and R_4) decreased the feed cost by 4.8, 18.4 and 18.5 %; and increased the economical efficiency by 4.7, 21.8 and 22.3 % comparing with the control ration (R_1).

Table (6): Economical evaluation of the experimental rations.

Item	Experimental groups			
	R_1	R_2	R_3	R_4
Cost of CM, PT	83.9	85.8	88.4	88.4
Cost of BH, PT	47.0	48.0	49.5	49.5
Cost of CS, PT	---	1.2	2.4	3.6
Total cost, PT	130.9	135.0	140.3	141.5
Feed cost, LE/kg gain	9.09	8.65	7.42	7.41
Economical efficiency*	1.93	2.02	2.35	2.36

R_1: 50% concentrate mixture (CM)+50% berseem hay (BH) without additive.
R_2, R_3 and R_4: R_1+2, 4 and 6 g coriander seeds (CS) /head/day, respectively.
SEM: Standard error of mean.
The cost of one ton of CM was 1250 LE. While, the price of one ton of BH was 700 LE and the price of one kg CS was 6 LE (based on year 2006 prices).
*Economical efficiency= price of one kg LBW (17.5 LE)/ feed cost (LE/kg gain).

These results are in harmony with the findings obtained by Abd-El-Maksoud et al. (1999), they reported that the improvement in feed conversion ratio were 4, 34, 36 and 37 % with adding 0.5, 1, 2 and 3 % Marjoram levels, respectively in the rations of Nile tilapia. While, the feed cost (LE / kg fish gain) decreased by adding marjoram in the treated rations comparing with control ration. Also, Abou-Ammou and El-Houssieny (1999), El-Saadany et al. (2001) and Ali et al. (2005) found that adding medicinal herbs and plants especially chamomile to sheep rations decreased feed cost compared to the unsupplemented ration.

From the previous results under the experimental conditions, it could be recommended for using coriander seeds as a feed additive (4 g /h/d) in rations of Rahmani lambs. It improved

growth rate, feed conversion and economical efficiency, whereas feed cost decreased.

ACKNOWLEDGMENT

I expresses my deep thanks to Mr. Ahamed Hamed farmer from El-Hamol city, Kafr El-Sheikh Governorate for providing facilities for carrying out this experiment at his farm and to Mr. Mohamed El-Shaarawy (Assistant lecturer at the Dept. of Anim. Prod. Fac. of Agric., Kafr El-Sheikh Univ.) for his assistance.

REFERENCES

Abou- Ammou, F.F. and H.M. El- Houssieny (1999). Performance and carcass characteristics of lambs fed Bosporo as feed additives, in summer and winter seasons. Egypt. J. Nutr. and Feeds, 2 (special Issue): 57.

Aboul- Fotouh, G.E.; S.A. Allam; E.I. Shehata and S.N. Abd El-Azeem (1999). Effect of some medicinal plants as feed additives on performance of growing sheep. Egypt. J. Nutr. and Feeds, 2: 79.

Abd El-Maksoud, A.M.S.; G.E. Aboul-Fotouh; S.M. Allam and R.M. Abou Zeid. (1999). Effect of marjoram leaves (*Majorana hortensis L.*) as a feed additive on the performance of Nile Tilapia (*Oreochromis niloticus*) fingerlings. Egypt. J. Nutrition and Feeds, 2 (1): 39-47.

Ali, M.F.; M.S. Saleh, N.M. Eweedah and S.A. Mahmoud (2005). Effect of using chamomile (*Mricaria chamomilla*) flowers as feed additives on performance of growing lambs under desert farming systems. Egyptian J. Nutrition and Feeds, 8(2): 127-137.

Allam, Sabbah, M.M. Hoda El-Houseiny; A.M. Abdel-Gawad; S.A. El-Saadany and A. M. M. Zeid (1999). Medicinal herbs and plants as feed additives for ruminants. 1- Effect of using some medicinal herbs and plants as feed additives on Zaraibi goat performance. The 7 th Conf. Animal Nutrition, 23-26, October, El-Arish, North Sinai.

Abd El-Rahim, E.A.; H.H.A., Khalaf and Ezzat (2001). Biotechnology studies on school children's biscuits enriched with natural sources of iron and zinc. Food quality 2001. PP. 291-303. 3 rd Inter. Conf. Food Industeries. Healthy food for my son (17-19 June, 2001), Alex. Egypt.

AOAC.(1990). Association of Official Analytical Chemists. Official Methods of Analysis.14th Ed ., Washington, D.C.

Church, D.C. (1988). The Ruminant Animal Digestive physiology and Nutrition 2nd Ed. O & B Books. INC.

Church, D. C. And W. G. Pond (1982). Basic Animal Nutrition and Feeding. 2 nd Ed . John Wiley & Sons, New York, U. S. A.

Doumas, B., W. Wabson and H. Biggs (1971). Albumin standards and measurement of serum with bromocresol green. Clin. Chem. Acta, 31: 87.

Drabkin, D.L. (1932). Calorimitric determination of haemoglobin. J.Biol. Chem., 98, 719.

Duncan ,D.B. (1955).Multiple Range and Multiple F test. Biometrics,11: 1.

El-Ashry, M.A.; H.M. El-Sayed; Hana M. El-Koussy; M.M. Khorshed; H.M. Saleh and A.K. Ammar (2004). Effect of lacto-sacc on feed efficiency, some blood constituents and reproductive performance of growing Egyptian buffalo heifers. Egyptian J. Nutrition and feeds, 7(1): 97-108.

El- Saadany, S A.; M. Abdel- Momin and F. Abou Ammou (2001). Effect of using medicinal herbs and plants mixtures as feed additives on the performance of growing lambs. J. Agric. Sci. Mansoura Univ., 26:5321.

Eskander, E.F. and H.W. Jun (1995). Hypoglycemic and hyperinsulinemic effect of some Egyptian herbs used for the treatment of diabetes mellitus (type II) in rats. Egypt, J. Pharma. Sci., 36, 1-6; 331-342.

Farrell. K.T. (1990). Species, condiments and seasonings 2nd ED., P.93-101, The AVI Publishing Co., Inc., Westport, Connection.

Henry. R.J.; D.C. Cannon and J.W., Winkelman. (1974). Clinical Chemistry: Princeples and Techniqius 11th Ed., Happer and Row Publishers PP. 1629.

Maged, G.A. (2004). Nutritional studies on small ruminants. M Sc. Thesis Fac. of Agric. Mansoura Univ.

Mohamed, A.H. and B.E. El-Saidy (2003). Effect of including filter cake blocks in lactating goats rations on digestibility and productive performance. Egyptian J. Nutrition and feeds, 6(1):59-67.

Mohamed, A.H.; B.E. El-Saidy and I.A. El-Seidi (2003). Influence of some medicinal plants supplementation: 1- on digestibility, nutritive value, rumen fermentation and some blood biochemical parameters in sheep. Egyptian J. Nutrition and feeds, 6(2):139-150.

Mohamed, A., H.; Nadia M. Abd El-Bar and K. Ibrahim (2005). Influence of some medicinal plants supplementation: 2- Lambs performance, carcass properties and mutton meat quality. Egyptian J. Nutrition and Feeds, 8(1) Special Issue:445-460.

NRC. (1985). Nutrients Requirements of Sheep. 5th Ed., Washington, D. C., USA.

Ranjhan, S. K. (1980). Animal Nutrition in Tropics. Vikas Publishing House PVT, LTD, New Delhi, India.

Saleh, M.S.; A.M. Metwally and M. Abd El-Momin (2005). Effect of feeding rations supplemented with biogen on digestibility and performance of growing lambs. Egyptian J. Nutrition and Feeds, 8(1) Special Issue:635-646.

Samlal, A.; T. Kumeir; P. Murthy and Pillai (2004). Hypoipidemic effect of *Corianderum sativum L.* in triton induced hyperlipidemic rats. Indian J. of Experimental Biology. 42: 913-918.

Shehata, E.E.; F.H. Abd El- Rasoul; M.E. Ahmed, F.F. Abou Ammou and R. El-Ahwal (2004). Effect of feeding a medicinal herb, chamomile flower on production and hygiene of goat milk production. Egypt. J. Nutr. and Feeds, 7: 109.

Singh, B. and A. LL. Taparia (1992). Effect of ammonation of hill grasses on nutrient utilization by crossbred heifers. Indian J. of Anim. Nutri., 9: 1, 46-51.

Soliman, A.Z.; N.Y. Abd El-Malak and A.M. Abbas (1995). Effect of using some commercial feed additives as promoters on

performance of growing and adult rabbits. Egyption J. of Appl. Sci., 10 (6): 501-513.

SPSS.(1997). SPSS Basic 7.5 for Windows, User's Guide, SPSS, Inc.

Trinder, P. (1969). Calorimitric determination of glucose. Ann. Clin. Biochem., 6, 24. Vet., Yugoslavia, 22:223.

Van Keulen, J. and B.A. Young (1977).Evaluation of acid insoluble ash as a natural marker in ruminant digestibility studies. J. Anim. Sci., 44:282.

Varley, H. (1976). Practical Clinical Biochemistry. 4th Ed., New Delhi, India.

Warner, A.C.I. (1964). Production of volatile fatty acids in the rumen, methods of measurements. Nutr. Abstr. and Rev. 3 4:339.

Youssef, M.M.; Abdiene, A.M.; Khattab, R.M. and S.M. Darwish (1998). Effect of feeding *Nigila sativa* on productive and reproductive performance of buffaloes. Egyptian J. Nutrition and Feeds. 1:2, 73-85.

Zeid, A.M. and M.E. Ahmed (2004). Productive performance of Zaraibi goats fed rations containing some medicinal herbs. J. Agric. Sci. Mansoura Univ. (C.F. Maged, 2004).

Zein, I. (2006). Using of coriander seeds (*Coriandrum sativum*) and their aqueous extracts as hypoglycemic agents. J. Agric. Res. Tanta Univ., 32 (1):103-133.

الملخص العربي

الاستفادة من بذور الكسبرة كإضافات غذائية فى عليقة الحملان الرحمانى

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أجريت هذه الدراسة علي ٢٨ من ذكور الحملان الرحمانى (متوسط عمرها ٦-٧ شهور، و متوسط وزنها ٢٧,٥٢ كجم) قسمت إلي ٤ مجموعات متماثلة (٧ حملان في كل مجموعة) في تجربة نمو استمرت ١٠٥ يوما. غذيت الحملان عشوائيا علي العلائق الاتية: العليقة

الأولى (ع١) تكونت من ٥٠ % مخلوط العلف المركز + ٥٠% دريس برسيم بدون إضافات(كنترول). بينما تكونت العلائق الثانية (ع٢) و الثالثة (ع٣) و الرابعة (ع٤) من عليقه الكنترول (ع١) مضاف اليها ٢، ٤، ٦ جم من بذور الكسبرة (ب ك) / رأس/يوم على الترتيب. فى نهاية تجربه النمو أستخدم ١٢ حيوان لإجراء أربع تجارب هضم (٣ حملان من كل مجموعة) لتقييم العلائق التجريبية باستخدام طريقة AIA، كما أخذت عينات من سائل الكرش و الدم في نهاية فترة التجربة. وأوضحت النتائج ما يلي:

١- معاملات هضم كل المركبات الغذائية (ماعدا الدهن الخام) و القيمة الغذائية (مجموع المركبات الغذائية المهضومة، البروتين المهضوم، الطاقة القابلة للتمثيل) للعلائق ٣ و ٤ كانت أعلى معنويا عنها لعليقه الكنترول (ع١)، ع٢.

٢- انخفض تركيز الامونيا (٠,٠٥) بينما ازداد تركيز الأحماض الدهنيه الطيارة (٠,٠٥) فى سائل كرش الحيوانات المغذاة على العلائق ٣ و ٤ مقارنه بعليقه الكنترول (ع١) و ع٢.

٣- ازدادت تركيزات الهيموجلوبين و البروتين الكلى و الالبيومين و الجلوبيولين (٠,٠٥) بينما انخفض تركيز الكلسترول (٠,٠٥) فى دم الحيوانات المغذاة على ع٣ و ع٤ مقارنه بالعلائق الأخرى.

٤- في تجربة النمو تحسن المأكول في صورة TDN بنسبه ٥,٤، ٢٠,٣، ٢٠,٥ % و في صورة DCP بنسبه ٤,٢، ٢٢,٠، ٢١,٢ % للمجاميع المغذاة علي العلائق الثانية و الثالثة و الرابعة على الترتيب مقارنه بالمجموعة المغذاة علي عليقة الكنترول (ع١).

٥- تحسن كل من معدل النمو (٠,٠٥) و معامل تحويل الغذاء والكفاءة الاقتصادية بينما انخفضت تكلفه الغذاء بإضافة بذور الكسبرة للعلائق التجريبية.