J. Agric. Sci. Mansoura Univ., 28(1): 185 - 194, 2003

EFFECT OF SUPPLEMENTING GROWING SHEEP RATIONS WITH BLACK CUMIN SEEDS (*Nigella sativa*).

Awadalla, I. M. and A E. Gehad
Department of Animal Production, National Research Centre, Dokki, Cairo, Egypt.

ABSTRACT

A growth trial that lasted 18 weeks was carried out to assess the effects of supplementing lambs' rations with black cumin seeds (BCS) (*Nigella sativa*).. Twenty one male Rahmani lambs weighing 33.7±0.85 kg, and aged 6 to 7 months were divided into 3 equal groups according to their body weight. The first group (control) was fed a complete feed mixture, while the second and third groups were fed the same mixture supplemented with 1% and 2% BCS, respectively. Feed for all groups was individually offered *ad libitum*. Supplementation with BCS significantly improved ($P<0.05$) average daily gain, and feed conversion ratio as kg DM intake/kg gain. A metabolism trial that followed the growth trial showed a significantly higher ($P<0.05$) nutrients digestibility and nitrogen utilization for the BCS supplemented rations over the control. Black cumin seeds supplemented rations significantly increased ($P<0.05$) ruminal ammonia 3 h post feeding compared to the control ration. Blood total protein and globulin were significantly higher ($P<0.05$) for lambs fed the 2% BCS supplemented ration compared to the 1% BCS supplemented and control rations. Carcass characteristics showed a significantly higher ($P<0.05$) carcass weight, hot carcass weight, and meat weight for animals fed the BCS supplemented rations. Supplementation of growing sheep rations with BCS can improve growth, nutrients digestibility, and enhance the immune status.

Keywords: Black cumin seeds, Rahmani sheep, Growth Performance, Digestibility, Carcass characteristics.

INTRODUCTION

There is an increased awareness of the health risks of consuming animal products where synthetic compounds such as antibiotics and hormones were added to the animal feeds as growth promoters. Already several countries have imposed a ban on using the previous compounds as growth promoters in animal feeds. This has fueled the search for alternative natural compounds that can replace those synthetic compounds in animal feeds without posing any health risk on the consumer. *Nigella Sativa* seeds, also known as Black cumin seeds (BCS) is a member of the *Ranunculaceae* family and native to the Mediterranean region and India. The BCS have been long used in folk medicine as a diuretic and carminative agent. Modern medicine have established the benefits of BCS as an antibacterial and antifungal (Rathee *et al.*, 1982), anti-carcinogenic agent (Worthen et. al., 1998), hypotensive agent (Zaoui *et al.*, 2000), antioxidant (Burits and Bucar, 2000), and as anti-inflammatory, antipyretic, analgesic (Al-Ghamdi, 2001). Proximate analysis revealed that BCS is a good source of crude protein, crude fat, and major elements such as Ca, P, K, Na, and Mg (Abdel-Aal and Attia, 1993). The fat content of BCS is rich in unsaturated fatty acids mainly linoleic and oleic acids (Babayan *et al.*, 1978). Supplementation of rabbit rations with BCS improved live body weight, daily weight gain, nutrients digestibility, and feed conversion ratio (Abdel-Azeem *et al.*, 1999).

The present study was conducted to investigate the effect of supplementing ruminant rations with BCS on growth performance, nutrients digestibility, nitrogen utilization, carcass traits, some rumen fermentation, and physiological parameters in the blood.

MATERIALS AND METHODS

This study was carried out at the Small Ruminants Research Unit, El Bostan, Nubaria, belonging to the Animal Production Department, National Research Center, Dokki, Cairo. Twenty one male Rahmani lambs weighing 33.7±0.85 Kg, and aged 6 to 7 months were divided into 3 equal groups of 7 lambs each according to their live body weight. The three groups were allotted randomly to three experimental rations. The first experimental ration was a complete feed mixture (control), whereas the second, and third rations were the same complete feed mixture (CFM) supplemented with ground BCS at the levels of 1% and 2% respectively (Table 1). The three rations were nearly isocaloric and isonitrogenous (Table 1). All three rations were individually offered *ad libitum* for the experimental animals twice daily at 8 a.m. and 2 p.m. Feed residues were collected and weighed once daily prior to the 8 a.m. feeding to estimate daily feed intake. Fresh water was freely available at al times. The experiment lasted for 18 weeks, lambs weights were recorded at the beginning of the experiment and thereafter at biweekly intervals throughout the experiment. On the last week of the growth trial, 5ml of blood were drawn from the jugular vein in heaparinized syringes before feeding from all the animals. The blood plasma was used for total protein (Armstrong and Carr, 1964), albumin (Doumas *et al.*, 1971), cholesterol (Watson, 1960), glutamic oxaloacetic transaminase activity (GOT), and glutamic pyruvic transaminase activity (GPT) (Reitman and Frankel, 1957) determinations. Globulin was determined by difference from the total protein fraction.

After the growth trial had ended, three lambs were randomly chosen and used to carry out a digestibility and nitrogen balance trial. Animals were individually housed in metabolic cages for a10 days preliminary period followed by a seven days collection period, where feces and urine samples were collected. On the last day of the digestibility trial, rumen liquor samples were withdrawn pre and 3 h post feeding via a stomach tube. Rumen liquor samples were divided into 2 portions, the first was used for immediate determination of pH and NH_3-nitrogen (AOAC, 1996). A few drops of toluene and a thin layer of paraffin oil was added to the second portion and then stored at-20°C until it was analyzed for total VFA's according to Warner (1964). The remaining 4 lambs from each experimental groups that were not used in the digestibility-nitrogen balance trial were deprived of feed for 18 h, and then slaughtered according to the Islamic method to obtain the carcass characteristics. The 9,10, and 11th rib sections were removed from both sides of the carcass and physically evaluated. A chemical analysis was also carried out for the eye muscle *(Longissimus dorsi)*. All chemical analysis of feed, feces, urine and meat were carried out according to AOAC methods (1996).

Data were subjected to statistical analysis using the general linear model, SAS (1998). Differences among the means where tested using the Duncan's multiple range test procedure (Duncan, 1955). Significance was set at ($p \leq 0.05$).

RESULTS AND DISCUSSION

Chemical Composition

Results of proximate analysis (Table 1) indicated that BCS is a rich source of both crude protein and fat 25.51%, 43.33%, respectively. Similar results indicating that BCS can be a good source of crude protein and energy have been reported by Babayan *et al.* (1978) and Awadalla (1997). This emphasizes the role that BCS can play as a rich supplement in animal nutrition.

Table 1. Chemical Composition of the experimental rations.

Ingredients	CFM	BCS	R1	R2	R3
Moisture,%	10.98	5.22	10.98	8.93	7.94
DM, %	89.02	94.78	89.02	91.07	92.06
Composition of DM, %					
CP	13.98	25.51	13.97	14.30	14.80
CF	13.72	8.54	13.72	13.50	13.90
EE	2.67	43.33	2.67	2.9	3.50
NFE	58.90	17.10	58.90	59.62	59.00
Ash	10.73	5.52	10.74	9.68	8.80

Complete feed mixture (CFM) contains: 25% Sunflower seed meal, 30% yellow corn, 11.5% wheat bran, 30% ground nut straw, 2% limestone, 1.2% common salt, 0.3% Mineral-Vitamins premix*

***Agrivit: each 3kg/ton of feed mixture contains: 12.5 m.i.u Vit.A, 2.5 m.i.u Vit.D_3, 10g Vit.E, 80 g Manganese, 6g Zinc, 5g Iodine, 0.25g Selenium, 0.1 g Cobalt, carrier substance of calcium carbonate to complete 3 kg.**

R1: CFM (Control)
R2: CFM+ 1% BCS
R3: CFM+ 2% BCS

Digestibility Coefficients and Feed intake

Digestibility coefficients, nutritive values, and feed intake for the three rations are presented in Table 2. Supplementation with 2% BCS significantly ($P<0.05$) improved the digestibility of DM, CP, CF, and EE over the control and 1% BCS rations. Furthermore, supplementation with either 1% or 2% BCS increased ($P<0.05$) the nutritive values (TDN and DCP) of the supplemented rations. Similar results were reported by Abdel-Azeem *et al.* (1999), where the supplementation of rabbit rations with 2% BCS improved nutrients digestibility and nutritive values of the supplemented rations. This indicates that the positive effects of BCS supplementation can be linked to different rations and different species. Interestingly, supplementing the ration with either 1 or 2% BCS did not improve (P>0.05) any of the feed intake parameters.

Nitrogen Utilization

The results of nitrogen utilization for the three experimental rations are presented in Table 3. Supplementation of the ration with 2% BCS significantly (P<0.05) increased N-intake (NI) over the control and 1% BCS. There was no difference (P>0.05) in fecal nitrogen among the three rations. On the other hand, urinary nitrogen was significantly higher (P<0.05) with 2% BCS ration. Supplementation with either 1% or 2% BCS resulted in a significantly (P<0.05) higher retained nitrogen (NR) than the control. Supplementation of the ration with either 1% or 2% BCS resulted in a significantly higher (P<0.05) NR/NI% and NR/N-digestible% over the control. This agrees with the findings of Abdel-Azeem *et al.* (1999), they found that rabbit rations supplemented with BCS increased both NI and NR. In another study, NI and NR were increased when soya bean meal was substituted with BCS meal for sheep rations (El-Ayek, 1999).

Table 2. Daily feed intake, nutrients digestibility, nutritive values of the experimental rations.

Item	Rations			±SE
	1	2	3	
DMI kg/h/d	1.44[a]	1.37[a]	1.33[a]	0.06
TDNI kg/h/d	0.89[a]	0.90[a]	0.96[a]	0.04
DCPI kg/h/d	0.13[a]	0.13[a]	0.15[a]	0.01
Digestibility %				
DM	60.65[b]	63.86[b]	71.16[a]	1.28
CP	63.68[b]	66.78[b]	74.03[a]	1.07
CF	49.38[c]	54.91[b]	64.46[a]	1.44
EE	71.26[b]	76.64[b]	82.16[a]	1.67
NFE	71.05[a]	72.83[a]	77.59[a]	5.12
Nutritive Value %				
TDN	61.09[c]	65.37[b]	72.21[a]	1.24
DCP	8.89[c]	9.55[b]	10.99[a]	0.15

a,b,c means with different superscripts in the same row are significantly different (P<0.05).

Table 3. Nitrogen balance results of the sheep fed the experimental rations.

Item	Rations			±SE
	1	2	3	
N-Intake g/d	36.59[b]	38.96[b]	47.32[a]	1.62
Fecal-N g/d	13.29[a]	12.94[a]	12.15[a]	0.79
Urinary-N g/d	20.11[b]	21.61[b]	29.37[a]	1.08
N-Retention g/d	3.06[c]	4.41[b]	5.80[a]	0.15
NR/NI %	8.49[b]	11.34[a]	12.25[a]	0.52
NR/ND %	13.41[b]	17.00[a]	16.49[a]	0.85

NR: retained nitrogen
NI: nitrogen intake
ND: Digestible nitrogen
a,b,c means with different superscripts in the same row are significantly different (P<0.05).

Rumen Fermentation Parameters

The effect of feeding the three experimental rations on pH, NH_3, TVFA's concentrations of the rumen liquor is shown in Table 4. The recorded pH values at 0 h and 3 h post feeding were in the range of 6 to 7 which is necessary for the normally functioning rumen (Abou-Akkada and Blackburn, 1967). The concentration of TVFA's at 0 h and 3 h post feeding were not different (P>0.05) among any of the three rations. However, the concentration of NH_3 increased significantly (P<0.05) at 3 h post by feeding the supplemented rations over the control. The increase in ruminal NH_3 concentration could satisfy the microbial needs for N, maximize the rate of fermentation in the rumen and finally enhance the synthesis of microbial protein in the rumen. Mehrez (1992) pointed out that the optimum rumen NH_3 concentration necessary to achieve maximum rate of fermentation in the rumen depends on roughage to concentrate ratio of the diet, being> 23.5mg/100ml for all concentrate diets.

Table 4. Rumen fermentation parameters of the sheep fed the experimental rations.

Item	Rations			±SE
	1	2	3	
pH (0h)	7.07[a]	7.07[a]	6.73[b]	0.06
pH (3h)	6.87[a]	6.77[a]	6.53[b]	0.06
NH_3· (0h)	11.33[a]	13.33[a]	12.00[a]	0.79
NH_3 (3h)	20.33[c]	27.33[b]	31.33[a]	1.11
TVFA's· (0h)	8.67[a]	9.33[a]	9.67[a]	0.67
TVFA's (3h)	14.00[a]	14.33[a]	15.00[a]	1.07

NH_3 mg/100ml
TVFA's meq/100ml
a,b,c means with different superscripts in the same row are significantly different (P<0.05).

Blood Parameters

The effects of feeding the three experimental rations on different blood parameters is presented in Table 5. Blood total protein levels were significantly (P<0.05) higher in 2% BCS group, whereas there was no difference between the control and 1% BCS groups. This increase was probably due to the significant (P<0.05) increase in the globulin fraction in the 2% BCS group. Since globulin is the main component of antibodies, an increase in the globulin levels indicates a good immune status of the animal. Cholesterol levels did not show differences (P>0.05) among the three groups. The activity of both GOT and GPT did not show differences (P>0.05) among the three groups, which would indicate that the supplementation with BCS did not adversely affect the liver functions.

Table 5. Some blood Parameters of the sheep fed the experimental rations.

Item	Rations			±SE
	1	2	3	
Total protein, g/100ml	7.46^{a}	7.58^{b}	8.60^{a}	0.36
Albumin, g/100ml	3.90^{a}	3.96^{a}	4.45^{a}	0.17
Globulin, g/100ml	3.56^{b}	3.62^{b}	4.15^{a}	0.19
Cholesterol, mg/dl	68.61^{a}	69.90^{a}	70.14^{a}	0.48
GOT, unit/ml	37.18^{a}	38.59^{a}	38.61^{a}	0.47
GPT, unit/ml	21.45^{a}	21.97^{a}	22.00^{a}	0.18

a,b means with different superscripts in the same row are significantly different (P<0.05).

Growth Performance

The effects of feeding the three experimental rations on growth performance are presented in Table (6). Final body weight (BW) and Initial BW were not different (P>0.05) among animals fed the three rations. However, animals fed the rations supplemented with 1% and 2% BCS had a significantly (P<0.05) higher average daily gain. Animals fed the ration supplemented with 2% BCS had significantly higher (P<0.05) relative growth indices than the animals fed the control ration, while 1% BCS supplemented ration was intermediate between the two. The results for feed conversion ratio showed that the animals fed the 2% BCS supplemented ration had the lowest (P<0.05) ratio calculated as kg DM intake /kg body weight gain (BWG), whereas the control group had the highest ratio and 1% BCS was intermediate. This would indicate better utilization of the absorbed nutrients when BCS was incorporated in the diet. There were no differences (P>0.05) in feed conversion ratios calculated as gm DCP intake/gm BWG or kg TDN intake/kg BWG among the three rations.

Table 6. Growth Parameters and Feed conversion of the sheep fed the experimental rations.

Item	Rations			±SE
	1	2	3	
Initial wt, kg	33.60^{a}	33.80^{a}	33.70^{a}	1.47
Final wt, kg	56.31^{a}	59.17^{a}	60.57^{a}	1.70
ADG, g	179.70^{b}	200.90^{a}	212.90^{a}	5.72
TG/IWx100	68.10^{b}	76.15^{ab}	80.75^{a}	3.99
TG/FWx100	40.44^{b}	42.97^{ab}	44.50^{a}	1.24
TG/(FW+IW)x100	25.37^{b}	27.43^{ab}	28.67^{a}	1.02
Feed conversion				
kg DMI /kg gain	8.04^{a}	6.97^{ab}	6.25^{b}	0.38
kg TDNI /kg gain	4.97^{a}	4.55^{a}	4.51^{a}	0.26
gm DCPI /gm gain	0.71^{a}	0.62^{a}	0.68^{a}	0.05

Experimental period for the growth trial was 126 days.
a,b means with different superscripts in the same row are significantly different (P<0.05).
ADG: Average daily gain
TG: Total gain
IW: Initial weight
FW: Final weight

Carcass Characteristics and Chemical composition of meat

Physical carcass characteristics and chemical composition of meat are presented in Tables 7 & 8. The rations supplemented with 1% and 2% BCS yielded a significantly higher (P<0.05) slaughter wt., carcass wt., empty body wt., meat wt., and hot carcass wt than the control ration. This was mainly due to the higher body weight at slaughtering, yet dressing percentages were not different among the three groups. The experimental treatments did not influence the chemical composition of the eye muscle (Table. 8).

Black cumin seeds' meal have been used as a source of protein in ruminant animals' rations and the results were promising (EL-Ayek, 1999). However, the aim of the present study was testing the growth promoting effect that can result from supplementing sheep rations with levels as small as 1 or 2% BCS. Supplementation of the rations with 1% and 2% BCS did not significantly alter the chemical composition of rations 2 and 3 nor any of the intake parameters. Yet, supplementation with BCS led to significant improvements in nutrients digestibility, nitrogen utilization, feed conversion, and carcass traits without no apparent adverse effects on the animals. Probably the most intriguing result of the present study was the effect of BCS supplementation on average daily gain. Average daily gain was 11.8% and 18.5% higher for animals fed on rations 2 and 3, respectively compared to the control ration. Historically, BCS have been safely used in folk medicine as a diuretic and carminative agent. Recently modern medicine has proven that BCS can be used safely in a multitude of medicinal purposes. Black cumin can act as a free radical scavenger with other anti-oxidant vitamins (Al-

Ghamdi, 2000), it can depress inflammatory responses (Al-Ghamdi, 2 000), can act as an antibacterial and antifungal (Rathee *et al.*, 1982), and can alleviate stress through its hypotensive effects (Zaoui *et al.*, 2000). There is no reason to dismiss that such activities of BCS were not potent when it was added to the present experimental rations. This can be seen from the clear positive results reported in this study, especially those concerning growth performance. W ith t his a malgam o f a ctivities B CS, can be a good natural growth promoter that can be used in animal nutrition. Furthermore, BCS addition to animal diets does not pose any health risk to the consumer. However, further research will be needed to delineate the mode of action to the positive effects of adding either BCS or BCS oil extract to animal rations as a growth promoting compound.

Table 7. Carcass Characteristics of the sheep fed the experimental rations.

Item	Rations			±SE
	1	2	3	
Slaughter wt., kg	56.85^{b}	62.13^{a}	62.00^{a}	1.56
Carcass. wt., kg	26.21^{b}	29.20^{a}	28.88^{a}	0.69
Empty BW, kg	50.11^{b}	55.60^{a}	55.98^{a}	1.38
9-11 ribs wt, kg	1.28^{a}	1.38^{a}	1.34^{a}	0.04
Meat wt., kg	0.71^{b}	0.83^{a}	0.83^{a}	0.03
Fat wt., kg	0.32^{a}	0.28^{ab}	0.25^{b}	0.01
Bone wt., kg	0.25^{a}	0.26^{a}	0.25^{a}	0.06
EOW[1], kg	1.24^{a}	1.32^{a}	1.22^{a}	0.04
HCW[2], kg	27.45^{b}	30.52^{a}	30.10^{a}	0.73
Dressing %[3]	46.10^{b}	47.01^{a}	46.59^{ab}	0.22
Dressing %[4]	48.29^{b}	49.13^{a}	48.56^{ab}	0.22
Dressing%[5]	52.28^{a}	52.52^{a}	51.61^{a}	0.34
Dressing%[6]	54.77^{a}	54.90^{a}	53.79^{a}	0.35
Ribs meat %	55.76^{b}	60.25^{a}	61.71^{a}	0.66
Ribs fat%	25.10^{a}	20.80^{b}	19.10^{b}	0.99
Bone %	20.01^{a}	18.91^{a}	19.15^{a}	0.44
Boneless meat %	80.80^{a}	81.10^{a}	80.90^{a}	0.59
Coefficient of meat	4.05^{a}	4.31^{a}	4.23^{a}	0.11
Meat:Bone	2.79^{a}	3.20^{a}	3.23^{a}	0.07
Meat:Fat	2.33^{a}	2.93^{a}	3.24^{a}	0.17

[1]Edible organs weight
[2]Hot carcass weight
[3] (HCW/Fasting body weight)x100
[4] (HCW with edible organs/fasting body weight)x100
[5] (HCW/empty body weight)x100
[6] (HCW with edible organs/empty body weight)x100
a,b, means with different superscripts in the same row are significantly different ($P<0.05$).

Table 8 : The chemical composition of the eye muscle in the sheep fed the experimental rations.

Item	Rations			±SE
	1	2	3	
Moisture %	76.00*	75.98	76.25	0.12
DM %	24.05*	24.03	23.75	0.43
CP %	19.00*	18.90	19.25	0.30
EE %	3.38*	3.62	3.07	0.18
Ash %	1.07*	1.07	1.07	0.03

*means in the same row are not significantly different ($p>0.05$).

ACKNOWLEDGMENT

The authors would like to thank Dr. M. I. Mohammed, Assistant Professor Researcher of Animal Nutrition, Animal Production Department, National Research Center for his efforts in conducting this study.

REFERENCES

Abd El-Aal, L. and R. Attia (1993). Characterization of black cumin *(Nigella sativa):* Chemical composition and lipids. Alex. Sci. Exch., 14:467.

Abdel-Azeem, F . Y .; M. El-Hommosany and N. G. M. Ali (1999). Effect of rationary black seeds supplementation on productive performance and some physiological parameters of growing rabbits. Egyp. Poult. Sci., 19:779.

Abou-Akkada, A. R. and T. H. Blacburn (1963). Some observations on the nitrogen metabolism of rumen proteolytic bacteria. J. Gen. Mic., 31:461.

Al- Ghamdi, M. S. (2001). The anti-inflammatory, analgesic and antipyretic activity of *Nigella sativa*. J. Ethnopharmacol., 76:45.

A.O.A.C (1996). Official Methods of Analysis (16th Ed.).Association of Official Analytical Chemists. Washington, DC, USA.

Armstrong, W. D. and C. W. Carr (1964). Physiological Chemistry. Laboratory

Direction, 3rd Ed. P. 75, Burgers Publishing Co. Minneapolis, MN., USA.

Awadalla, I. M (1997). The use of black cumin seed *(Nigella sativa)* cake in rations of growing sheep. Egyp. J. Nut. Feeds., 1:243.

Babayan, V. K.; D. Kootungal and G. A. Halaby (1978). Proximate analysis, fatty acid and amino acid composotion of *N igella s ativa L* . s eeds. J . Food. Sci., 43:1314.

Butris, M. and F. Bucar (2000). Antioxidant activity of *Nigella sativa* essential oil. Phytother. Res., 14:323.

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

Duncan, D. B. (1955). Multiple range and multiple F. test. Biometrics, 11:10.

El-Ayek., M. Y. (1999). Influence of substituting concentrate feed mixture by *Nigella sativa* meal on: I-Voluntary intake, digestibility, some rumen parameters, and microbial protein yield with sheep. Egyp. J. Nut. Feeds., 2:279.

Mehrez, A.Z.(1992).Influence of roughage:concentrate ration on N requirements of rumen microbes for maximal rate of fermentation. Proc. Int. Conf. On "Manipulation of Rumen Microorganisms to Improve Efficiency of Fermentation and Ruminant Production." P234-247. Alexandria., 20-23 September.

Rathee, P. S.; S. H. Mishra. and R. Kaushal (1982). Antimicrobial activity of essential oil, fixed oil and unsaponifiable matter of *Nigella sativa L.* Indian. J. Phrmac. Sci., 44:8.

Reitman, S. and S. Frankel (1957). Calorimetric method for the determination of serum glutamic-oxaloacetic transaminase-and glutamic pyruvate transaminase. An. J. Clin. Path., 28:56.

SAS (1998). SAS users guide for personal computers, SAS Institute Inc., Cary, NC., USA.

Warner. A. C. (1964). Production of volatile fatty acids in the rumen. Methods of measurements. Nutr. Abstr. Rev., 34:339.

Watson, D. (1960). A simple method for the determination of serum cholesterol. Clin. Chem. Acta., 5:637.

Worthen, D. R.; O. A. Ghosheh, and P. A. Crooks (1998). The *in vitro* anti-tumor activity of some crude and purified components of black seed, *Nigella sativa L.* Anticancer Res., 18:1527.

Zaoui, A., Y.; Cherrah; M. A. Lacille-Dubois; A. Settaf; H. Amarouch; and M. Hassar (2000). Diuretic and hypotensive effects of *Nigella sativa* in the spontaneously hypertensive rat. Therapie., 55:379.

تأثير إضافة بذور حبة البركة إلى علائق الحملان النامية

إبراهيم محمد عوض الله وأحمد السيد جهاد

قسم الإنتاج الحيوانى – المركز القومى للبحوث – الدقى– القاهرة – مصر

أجريت تجربة نمو استمرت ١٨ أسبوعا لدراسة تأثير إضافة بذور حبة البركة إلى علائق الحملان النامية وقد تم استخدام أحدى وعشرون حمل رحمانى بمتوسط وزن ٣٣,٧± ٠,٨٥ وعمر يتراوح بين ٦-٧ أشهر حيث تم توزيعها عشوائيا إلى ثلاث مجموعات متساوية طبقا لوزن الجسم . غذيت المجموعة الأولى على علف متكامل بينما تم تغذية المجموعتان الثانية والثالثة على نفس العلف مضافاً إليه ١% بذور حبة البركة على الترتيب وقد قدمت العلائق الثلاثة لجميع الحيوانات بصورة منفردة حتى الشبع .

أدى استخدام بذور حبة البركة :

١- إرتفاع معدل الزيادة اليومية ($P<0.05$) ٢- إرتفاع كفاءة التحويل الغذائى ($P<0.05$)

٣- إرتفاع معاملات هضم المكونات الغذائية ($P<0.05$) فى العلائق.

٤- إرتفاع مستوى الأمونيا بالكرش ($P<0.05$) بعد ٣ ساعات من التغذية.

٥- إرتفاع مستوى البروتينات الكلية والجلوبيولين ($P<0.05$) بالدم فى العليقة المضاف إليها ٢% بذور حبة البركة مقارنة بالعليقتين الأخريتين.

٦- إرتفاع وزن الذبيحة ووزن اللحم ($P<0.05$) . وعلى هذا يمكن استخلاص إن إضافة بذور حبة البركة إلى علائق الحملان أدى إلى تحسين معدلات النمو وتحسين معاملات الهضم وإرتفاع معدل التحويل الغذائى وزيادة الكفاءة المناعية للحيوانات.