

The Effects of Use *Nigella Sativa* and / or *Trigonella Foenum Graecum* Seeds as Feed Supplementations on Some Wool Growth and Its Physical Traits of Awassi Male Lambs

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Summary

The experiment was carried out at animal farm, College of Veterinary Medicine, Baghdad University from 1/July /2009 up to 28/February2010. Twenty Awssi male Lambs were equally divided into four groups and each animal fed on concentrate diets 2% of body weight with grazing for 3-5 hours a day. The first group(C) was kept as control group , the second group (N) was daily fed with same amount of concentrate diet contain 7.5% ground *Nigella sativa* seeds , third group (F) also fed with same amount contain 7.5% ground fenugreek seeds ,while the fourth group(NF) group fed the 2% concentrate diet supplemented with both (7.5% of *Nigella sativa* and 7.5% fenugreek seeds respectively) as group feeding .

The results revealed that using *Nigella sativa* or Fenugreek seeds as well as using both of them as a mixed feed supplemented with concentrated diet of Awassi ram lambs showed significantly ($P < 0.05$) increasing and improvements in greasy wool weights , clean wool weights ,wool fiber lengths ,wool staple lengths ,wool fiber diameters compare with control group while NF group recorded significantly ($P < 0.05$) higher than both of F and N groups in all of these parameters.

تأثير استخدام اضافات علفية من بذور نبات الحبة السوداء و/ او الحلبة المطحونة لاعلاف ذكور الحملان العواسية على نمو الصوف وبعض صفاته الفسلجية

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الخلاصة

اجريت هذه التجربة في الحقل الحيواني التابع لكلية الطب البيطري / جامعة بغداد للفترة من 2009/7/1 الى 2010/2/28 تضمنت التجربة 20 حملا عواسيا بعمر 4-5 اشهر ووزن 20-22 كغم. وزعت الى اربعة مجاميع مع الاخذ بنظر الاعتبار وزن الجسم الحي وكما يلي : المجموعة الاولى (C) مجموعة السيطرة و غذيت على العلف المركز بنسبة 2% من وزن الجسم لكل راس يوميا.

المجموعة الثانية (مجموعة الحبة السوداء) N و غذيت على نفس النسبة من العلف المركز الحاوي على 7,5% من الحبة السوداء المطحونة لكل راس يوميا . المجموعة الثالثة (مجموعة الحلبة) F و غذيت على نفس النسبة من العلف المركز الحاوي على 7,5% من الحلبة المطحونة لكل راس يوميا . اما المجموعة الرابعة (مجموعة العلف الخليط) وتحتوي على كلا من 7,5% من بذور الحبة سوداء المطحونة + 7,5% من بذور الحلبة المطحونة لكل راس يوميا . مع السماح لكل المجاميع بالرعي الحر لمدة 3-4 ساعات يوميا , وتقديم العلف الاخضر و الماء في حالة عدم الرعي .

اخذت نماذج الصوف لاربعة مرات بفارق شهرين لكل مرة ابتداء من 2009/7/2 من منطقة الخاصرة قرب الضلع الاخير . حيث اظهرت النتائج تفوقا معنويا واضحا وبمقدار ($P < 0.05$) للمجاميع المعالجة بالمقارنة مع مجموعة السيطرة وطيلة الفترات الزمنية التي تم فيها اخذ النماذج في كل من وزن الصوف الخام ووزن الصوف النظيف وطول الليفة الواحدة وطول الخصلة وقطر الالياف . كما سجلت مجموعة العلف الخليط تفوقا معنويا متميزا وبمقدار ($P < 0.05$) مقارنة بالمجاميع المعالجة في كل الصفات المذكورة و في كل الفترات التي تم فيها سحب النماذج في حين كانت القيم المسجلة لمجموعة السيطرة اوطا القيم بالمقارنة مع بقية المجاميع .

Introduction

Wool production plays an important role for the economics of sheep rearing due to their economic outcomes from such important sheep production. The chemical corporation of wool

fibers is 50% carbon, 7 % hydrogen, 22 %-25 % oxygen, 16-17 %nitrogen and 3-4 % sulfur. More than 90 % wool sulfur found as amino acid cystein.

This amino acid represents 9-13 % of the clean total dry wool weight (1). The therapeutic properties of the medical plants return to the presence of some chemical compounds in plant tissues which have a specific effect on animal bodies. These compounds are alkaloids, glycosides, volatile oils or others (2). Wool growth is a part from body growth along the longevity of sheep and there is a positive relationship between body weight and most wool physical traits (3). However ,wool production and its physical traits are affected by many factors , such as age, sex, genotype, body weight, physiological status, environmental conditions and level of feeding (3) .Williams and Morley (4)found that feeding diet containing cystine , has a vital role to stimulate more wool growth .

Lee and Williams (5) studied the relationship between the blood serum cystein and wool growth ; the high wool growth and the best physical traits were in groups treated with vit E in which their blood serum contained high ratio of cystein . Halis and Fawcett (6) showed that in group of sheep treated with vit E , the blood supply to skin was higher than those were not treated and there was a positive correlation between wool growth and blood supply to the skin , by adding vit E which reduces the oxidation in the skin and improve protein anabolism process causing more wool growth. However, no information is available on the effect of Nigella and /or Fenugreek seeds as feed additives in the diets on wool production and its physical traits in our country.

Materials and methods

This experiment was conducted at animal farm, College of Veterinary Medicine, Baghdad University from 1/July/2009 up to 28/ February/2010. Twenty Awassi ram lambs were bought at age of 4-5 months at body weight (20-22 kg). They were fed on concentrate diet (2%) of body weight and were freely grazed for 3-6 hours /day on the College Fields as a preliminary period for 3-4weeks, Also they were supplied with tap water and mineral blocks. All animals were examined and treated before the experiment be started then they were precautious vaccinated against enterotoxaemia by (Co-Baghdad), also they were treated with ecto and endo parasites by using Ivermectin and treated orally with Albendazol. Lambs were divided equally (body weight was considered) into four groups (5 each):

The first group(C), was daily fed on 2 %of body weight of concentrate diet / a head, and kept as control group. The second group (N) was daily fed on the same amount of the concentrate diet /a head contain (7.5%) ground Nigella sativa seeds per head. The third group (F), also was given the same level of concentrate diet/a head contain (7.5%) ground Fenugreek seeds per head. The fourth group (NF) mixed group, also were daily given 2 % of concentrate diet /a head supplemented with both (7.5%) ground Fenugreek seeds + supplemented with (7.5%) ground Nigella Sativa seeds.

All animal grazed daily as one group. In addition, hay and green roughages were freely offered when the animal couldn't graze.

An area of 5 x5 (cm²) of the right mid – side at the level of the last rib of the animal was delineated with a hair – pin caliper .Wool within this area was clipped to skin level , at the beginning of the experiment , and at the end of each wool growth period . More wool was subsequently removed around the area to facilitate subsequent sampling.

The wool samples were kept in cellophane bags in room temperature. The staple length was measured with a ruler from the bottom end of the staple to the point at which the fiber became thin or tippy. The greasy wool weight was measured with analytical balance. The clipped patches wool was washed by passing it through three beakers. The first one contained 1500 ml of 10% detergent in warm water approximately 55 ° C, the other two bakers contained warm water at 50 ° C and 45 ° C respectively (3).

Samples were left in the same room temperature for three days to dry off. Next clean weight was measured. The length of individual fibers was measured by means of two forceps

and a ruler. Each fiber was held by forceps, one at each end, and gently pulled to keep it straight. Then it was put on a clearly graduated ruler capable of measuring to 1 mm, 50 fibers from each sample were measured. Then the means of fibers length were calculated. The diameters of fibers were a measured by means of a graduated ruler microscope. The wool samples were cut into small pieces around 1 mm in length with scissors and the fragments were amounted on microscope slides in liquid paraffin drop and covered by a slip was put into place. From each slide 100 fibers were measured, the means of the fiber diameter were calculated (3). The data were analyzed; using complete randomized design (CRD) at least significant differences (LSD) was applied to detect the significant differences among different group, means at 5% level (7).

Results

A - Greasy wool weight:

Greasy wool sample weights significantly differ ($P < 0.05$) among different treatments at the last three sampling times (Table1). The greasy wool growth of the control group recorded the lowest values in these periods, while group NF showed significantly ($P < 0.05$) higher values at different sampling times compared with the other treated and the control groups .

Table (1) Effect of Nigella sativa and / or Fenugreek seeds in the diet greasy wool weight (gm) of Awassi male lambs (means \pm SE).

Period	Treatment				LSD Value
	N group	F group	NF group	Control	
First sampling 2/7/2009	1.78 \pm 0.03	1.75 \pm 0.02	1.78 \pm 0.10	1.63 \pm 0.006	
Second sampling 2/9/2006	0.87 \pm 0.03 a	0.81 \pm 0.02 ab	0.92 \pm 0.06 a	0.72 \pm 0.007 b	0.19
Third sampling 2/11/2009	2.95 \pm 0.06 b	2.85 \pm 0.18 b	3.45 \pm 0.16 a	2.67 \pm 0.10 b	0.42
Fourth sampling 2/1/2010	3.06 \pm 0.02 b	2.88 \pm 0.06 bc	3.47 \pm 0.15 a	2.71 \pm 0.12 c	0.32

Different letters show significant differences among treatments at one period at 5% level

B-Clean wool sample weight:

There were significant differences between NF group and all other groups in the clean wool weights in the last three sampling times as illustrated in Table (2) .The NF group recorded significant ($P < 0.05$) higher values than all other groups .

Table (2) Effect of Nigella sativa and / or Fenugreek seeds in the diet on clean wool weight (gm) of Awassi male lambs (means \pm SE)

Period	Treatment				LSD Value
	N group	F group	NF group	Control	
First sampling 2/7/2009	1.39 \pm 0.03	1.39 \pm 0.02	1.47 \pm 0.05	1.24 \pm 0.01	
Second sampling 2/9/2006	0.61 \pm 0.03 b	0.57 \pm 0.02 b	0.72 \pm 0.06 a	0.53 \pm 0.01 b	0.01
Third sampling 2/11/2009	2.17 \pm 0.40 b	2.25 \pm 0.06 b	2.90 \pm 0.14 a	2.08 \pm 0.11 b	0.31
Fourth sampling 2/1/2010	2.22 \pm 0.04 b	2.35 \pm 0.06 b	3.07 \pm 0.22 a	2.15 \pm 0.06 b	0.19

Different letters show significant differences among treatments at one period at 5% level.

C-Fiber length :-

There were significantly ($P < 0.05$) differences appeared in the second , third and fourth sampling times among all treated groups ,but the control group recorded the lowest values , while NF group showed the highest values compared with the other two groups (Table 3)

Table (3) Effect of Nigella sativa and / or Fenugreek seeds in the diet on wool fibers length (cm) of Awassi male lambs (means \pm SE)

Period	Treatment				LSD Value
	N group	F group	NF group	Control	
First sampling 2/7/2009	8.57 \pm 1.03	7.46 \pm 0.73	8.40 \pm 1.37	7.70 \pm 0.51	
Second sampling 2/9/2006	4.80 \pm 0.38 ab	4.12 \pm 0.18 b	5.45 \pm 0.57 a	3.85 \pm 0.15 b	1.13
Third sampling 2/11/2009	5.14 \pm 0.40 ab	4.46 \pm 0.18 b	5.71 \pm 0.58 a	4.10 \pm 0.14 b	1.15
Fourth sampling 2/1/2010	5.28 \pm 0.41 a	4.67 \pm 0.18 ab	5.29 \pm 0.31 a	4.30 \pm 0.12 b	0.87

Different letters show significant differences among treatments at one period at5% level .

D-Wool staple length:

Significant ($P < 0.05$) differences Wool staple length among all different treated and the control groups appeared from the second sampling ,the NF group recorded the highest values while the control group recorded the lowest values in the last three sampling studied periods (Table 4)

Table (4) Effect of Nigella sativa and / or Fenugreek seeds in the diet on wool staple length (cm) of Awassi male lambs (means \pm SE)

Period	Treatment				LSD Value
	N group	F group	NF group	Control	
First sampling 2/7/2009	8.00 \pm 0.90	6.8 \pm 0.72	7.77 \pm 0.24	6.85 \pm 0.25	
Second sampling 2/9/2006	4.05 \pm 0.15 ab	3.77 \pm 0.20 b	4.97 \pm 0.58 a	3.52 \pm 0.24 b	1.05
Third sampling 2/11/2009	4.45 \pm 0.37 ab	3.98 \pm 0.22 ab	5.17 \pm 0.58 a	3.68 \pm 0.24 b	1.18
Fourth sampling 2/1/2010	4.57 \pm 0.38 ab	3.98 \pm 0.19 b	5.32 \pm 0.58 a	3.62 \pm 0.19 b	1.16

Different letters show significant differences among treatments at one period at5% level .

E-Wool Fiber diameter:

The fiber diameter of the animals in the control group showed significantly ($P < 0.05$) lower values than those of the treated groups in most sampling studied periods (Table5).

Table (5) Effect of Nigella sativa and / or Fenugreek seeds in the diet on wool fiber diameter (μ) of Awassi male lambs (means \pm SE)

period	Treatment				LSD Value
	N group	F group	NF group	Control	
First sampling 2/7/2009	28.82 \pm 0.38	28.83 \pm 0.43	28.92 \pm 0.31	28.92 \pm 0.51	
Second sampling 2/9/2006	31.25 \pm 0.54ab	31.50 \pm 0.88aa b	32.45 \pm 0.48a	29.85 \pm 0.53b	1.90
Third sampling 2/11/2009	33.61 \pm 0.41a	33.55 \pm 0.35a	34.52 \pm 0.24a	30.87 \pm 0.26b	0.99
Fourth sampling 2/1/2010	34.82 \pm 0.52b	35.07 \pm 0.45ab	36.02 \pm 0.27a	32.07 \pm 0.21c	1.19

Different letters show significant differences among treatments at one period at5% level .

Discussion

The significant ($P < 0.05$) increase in greasy wool, clean wool, staple length, fibers length and diameter of animals fed feed additives compared with control group through a reflex of metabolic condition as a result of both *Nigella sativa* seeds and Fenugreek seeds which contain high ratio of protein with sulfur amino acids (methionin and cystine), also volatile fatty acids and nutrient as anti-oxidant substance (8), (9), (10) and (11), which reflexes the health status of animals and an improvement in blood parameters and more blood supply to the skin causing an increase in the activity and efficiency of wool follicles. This also, could confirm the importance of the nutrition and its effects on wool production and improvement in health status, as a reflex of the level of ALP enzyme and its correlated with wool growth (12), (13), (14) and (15).

However, Al-Saigh and Al-Kass (1) confirmed that wool growth and its physical traits improved when sheep fed on a diet of high protein and sulfur contents, causing an increase in amino acids such as methionin and cystine which have a vital role for wool growth and its physical traits (16). Also vit E plays a vital role for wool growth and its physical traits in which Fenugreek and *Nigella sativa* seeds of high content of vit E (17).

Halis and Fawcett (17) found that in sheep treated with vit E, blood supply to the skin was higher than those not treated and there was a correlation between wool growth and blood supply to the skin by adding vit E reduced the oxidation in the skin and an improvement in protein anabolism process causing more wool growth. In addition, Al-Saigh (1) showed a high correlation between body weight and wool growth and its physical traits, this means that wool growth can attribute with body growth as a whole. The mixed group showed significantly ($P < 0.05$) higher values in wool growth and its physical traits compared with N and F groups, this could be due to the synergistic effect of both *Nigella sativa* and Fenugreek seeds.

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