

تأثير استخدام بذور نبات الحبة السوداء و/او الحلبة المضافة الى اعلاف ذكور الحملان العواسية في بعض صفات الذبائح

ماجد جودة لعبي الساعدي * مظهر نافع رحو الصائغ **
ضياء عبد الامير ** سند باقر الاعرجي ***

الملخص

اجريت هذه التجربة في الحقل الحيواني التابع لكلية الطب البيطري/جامعة بغداد للمدة من 2009/7/1 الى 2010 /2/28 تضمنت التجربة 20 حملاً ذكرياً عواسياً بعمر 4-5 اشهر وبوزن 20-22 كغم، وزعت الى اربع مجاميع مع الاخذ بنظر الاعتبار وزن الجسم الحي وكما يأتي:

المجموعة C (مجموعة السيطرة) غذيت على العلف المركز بنسبة 2% من وزن الجسم/رأس يومياً. المجموعة N (مجموعة الحبة السوداء) غذيت على النسبة نفسها من العلف المركز الذي يحتوي على 7.5% بذور نبات الحبة السوداء المطحونة/راس يومياً. المجموعة F (مجموعة الحلبة) غذيت ايضاً على النسبة نفسها من العلف المركز المحتوي على 7.5% بذور نبات الحبة السوداء المطحونة/رأس يومياً. المجموعة NF (مجموعة الخليط) وغذيت يومياً على النسبة نفسها من العلف المركز الحاروي على كلاً من 7.5% من بذور نبات الحبة السوداء المطحونة + 7.5% بذور نبات الحبة السوداء المطحونة/رأس يومياً. مع السماح للمجاميع كلها بالرعي الحر لمدة 3-4 ساعات يومياً، وتقديم العلف الاخضر والماء في حالة عدم الرعي. تم ذبح الحيوانات جميعها بعد 8 اشهر إذ اظهرت النتائج التالية: في وزن الجسم الحي ووزن الجسم الفارغ عند الذبح ووزن الذبيحة الحار والبارد سجلت المجاميع كلها المعالجة تفوقاً معنوياً ($p < 0.05$) مقارنة مع مجموعة السيطرة. إذ ان الاعضاء الصالحة للاكل جميعها في ذبائح الحيوانات في المجموعة NF مرتفعة معنوياً بمستوى ($p < 0.05$) مقارنة بمجموعة السيطرة عدا نسبة قطعية الزند التي سجلت العكس. كما تفوقت اوزان كل من مجموعتي N و F معنوياً وحسابياً في اغلب نسب واوزان القطعيات مقارنة مع مجموعة السيطرة، كما لوحظ ايضاً ان وزن اللحم والدهن ونسبتهما في قطعية الاضلاع الستة قد ارتفع.

سجل جدول حساب الجدوى الاقتصادية رقماً ربحياً عالياً في المجموعات المعالجة خاصة مجموعة العلف الخليط المحتوي على الحبة السوداء والحلبة مقارنة بمجموعة السيطرة ومجموعة N و F للتان سجلتا ايضاً ربحاً اقتصادياً عالياً من خلال الزيادة الوزنية المتحققة لهذه المجاميع، إذ نوصي باستخدام هذه الاضافات لاعلاف الحيوانات الكبيرة والدواجن وبالنسب العلمية الملائمة لتحقيق اعلى كفاءة انتاجية.

جزء من اطروحة الدكتوراه للباحث الاول.

* الشركة العامة للسيطرة - وزارة الزراعة - بغداد، العراق.

** كلية الطب البيطري - جامعة بغداد - بغداد، العراق.

*** كلية التقنيات الاحيائية - جامعة بغداد - بغداد، العراق.

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From this experiment it could be recommend to add such ground feed additives to the diet of lambs as well as it can be supplemented to diet poultry for more economic profit.

Table 3: The effect of *Nigella sativa* and/or Fenugreek seeds contents in the on the weight and ratio of the rack joint's component of Awassi male lambs (means \pm SE)

Period	Treatment				LSD Value
	N group	F group	NF group	Control	
Eye muscle area (cm ²)	1720 \pm 0.06 b	1780 \pm 0.05 b	2270 \pm 0.18 a	1210 \pm 0.90 c	0.40
Fat thickness (cm)	3.38 \pm 0.12 b	3.88 \pm 0.24 b	4.38 \pm 0.22 a	3.13 \pm 0.89 c	0.15
Eye muscle weight(g)	216 \pm 3.37 a	209 \pm 2.82 a	254 \pm 1.44 a	158 \pm 3.81 b	50.36
Lean weight(g)	403 \pm 4.58 a	381 \pm 2.02 b	441 \pm 6.55 a	280 \pm 4.19 c	60.55
Fat weight (g)	85 \pm 1.08 b	100 \pm 0.06 b	122 \pm 3.04 a	66 \pm 2.01 c	20.20
Bone weight (g)	135 \pm 1.03 b	139 \pm 2.32 b	156 \pm 2.23 a	150 \pm 1.87 a	11.02
Lean %	62.96 \pm 3.21 a	61.45 \pm 2.34 a	60.99 \pm 2.20 a	56.56 \pm 4.31 b	4.22
Fat %	13.62 \pm 0.88 b	16.12 \pm 1.02 a	16.87 \pm 0.94 a	13.33 \pm 1.12 b	3.05
Bone %	21.63 \pm 0.98 a	22.41 \pm 5.22 a	21.31 \pm 3.79 a	30.30 \pm 1.14 b	8.12

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

Table 4: show the amount of the total and daily concentrate diet intake and feed additive/head, along the experimental period and feed conversion efficiency

Total	N group	F group	NF group	C group	Mean
Amount of concentrated diet /head along the experimental period (kg)	104.61	104.92	107.81	96.30	103.31
Daily concentrated diet (g)	536.50	538.10	552.9	493.90	529.80
Total gain(kg)	17.00	19.75	22.25	12.24	17.84
Feed conversation efficiency from concentrated diet(kg)	6.15	5.31	4.58	7.87	5.79
Amount of <i>Nigella sativa</i> seeds(kg)consumed/head	7.85	-	7.85	-	-
Amount of Fenugreek seeds(kg)consumed/head	-	7.85	7.85	-	-
Amount of concentrated diet consumed without feed additive(kg)/head	96.76	97.07	92.11	96.30	-
Cost of feed additives ID/1000	11.77	11.77	23.55	-	-
The price of the gain ID/1000(7000ID/Kg/b.w)	119.10	138.25	155.75	85.65	-
Concentrate cost 1000/ID without feed additives /head	24.14	24.27	23.03	24.08	-
Total cost 1000/ID of the concentrate/head	35.89	36.04	46.58	24.08	-
Total economic profit 1000/ID/head	83.21	102.21	109.17	60.61	-

feeding increased from 0.5 to 0.75 kg/ day in addition to concentrate diet feeding. The same results were observed for the weight of lean and in the rack joint percentage compared with the control group, Ramzi (11) conducted the same trend using parsley seeds and with or without vit E administration. The NF group showed significantly ($p < 0.05$) high value in rib eye muscle area than those in N and F groups, this could be due to higher carcass and rack joints weight through the synergistic effect appeared in N and F group. Also group NF and N showed significantly ($p < 0.05$) higher values in the weight of the lean than those of fenugreek seeds group, this could be due that *Nigella sativa* can anabilized protein in the body more than fat which was found in group F. Al-Musawey (2) showed similar trend using Zingiber and *Eruca sativa*. The fat content in rib eye muscle area of treated groups were significantly ($p < 0.05$) higher than the control group as a result of more carcass weight in the treated groups, also, the same trend was shown in the fat thickness. In the mean time the weight of bone in rack joint in NF and control groups was significantly ($p < 0.05$) higher than those in N and F groups, this could be due to lack numbers of observation in this study. The lean ratios of the treated groups were significantly ($p < 0.05$) higher than the control group, this could be due to the carcass weights, while fat percentages of groups NF and F showed significantly ($p < 0.05$) higher values than those of N and control groups, this means that fenugreek caused an increase in adipose tissue in the body weight than *Nigella sativa* seeds.

In the mean time bone ratio of the control group showed significantly ($p < 0.05$) higher values than those of treated groups, because the bone is an early maturing tissue, while lean and fat are late maturing (Al-Jassim; 1995). However Al-Saigh and Al-Jassim (1) and Zgur (15) showed that muscle percentages increased in the whole carcasses joints as body weight and age of animals progress, while fat percentage, increased with age and body weight at late maturity. Al-Musawey (2). showed the same trend, while Ramzi (11) showed that the parsley seeds caused significantly ($p < 0.05$) higher lean weight and ratio in the rack joint of the Karadi male lambs and low bone ratio than the control group.

Economic evaluation of this research

From Table (4) it was observed that the mean amount of the total concentrate diet consumed by each animal in different groups were 104.61, 104.92, 107.81 and 96.3 kg for groups N, F, NF and control along the experimental period respectively. However, the amount of concentrate diet consumed by each animals without feed additive in different groups were 96.76, 97.07, 92.11 and 96.30 respectively, while the total amount of the feed supplements were 11.77, 11.77, 23.55 and 0.00 kg respectively.

The price of the concentrate diet (kg) without feed additives was 250 ID and the price of both feed supplements for each kg was 1.500 ID. Then the total cost for the concentrate diet for all groups were 35.895, 36.040, 46.580, and 24.080 ID respectively, However, assuming the live weight price for each kg is 7000 ID, then the total gain 17.00, 19.75, 22.25 and 12.24 kg for N, F, NF and control groups. Then, the total price are 119.100, 138.250, 155.750 and 85.680 ID/1000, thus, the total profit for each group are 83.21, 102.21, 109.16, and 61.60 ID/1000.

This economic evaluation was only done on the cost of the concentrate diet compared with the meat production, without roughages consumed because it was given to all lambs as group feeding.

kidney percentages of NF group recorded significantly ($p < 0.05$) higher values than those of other groups (Table 2).

Table 2: The effect of *Nigella sativa* and/or Fenugreek seeds contents in the diet on the edible parts and organs percentage of Awassi male lambs (means \pm SE)

Organs (%)	Treatment				LSD Value
	N group	F group	NF group	Control	
liver	1.70 \pm 0.05 a	1.70 \pm 0.08 a	1.78 \pm 0.10 a	1.53 \pm 0.02 b	0.11
heart	0.54 \pm 0.02	0.50 \pm 0.07	0.55 \pm 0.88	0.53 \pm 0.09	
lungs	2.04 \pm 0.18 a	2.19 \pm 0.14 a	1.98 \pm 0.24 a	1.72 \pm 0.21 b	0.08
spleen	0.21 \pm 0.12 b	0.23 \pm 0.04 a	0.24 \pm 0.07 a	0.22 \pm 0.05 b	0.02
kidney	0.50 \pm 0.37 b	0.50 \pm 0.06 b	0.55 \pm 0.05 a	0.53 \pm 0.09 b	0.02
Kidney fat	0.21 \pm 0.03	0.25 \pm 0.05	0.026 \pm 0.02	0.24 \pm 0.11	
Mesenteric fat	0.98 \pm 0.19	1.06 \pm 0.09	1.29 \pm 0.06	1.07 \pm 0.01	

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

Feed additives caused an increase in the weight of edible organs (liver, heart, lung, spleen, kidney and kidney fat) except the mesenteric fat. Al-Jassim (1) reported that such organ weights increased with an increase in the body weight. The NF group recorded significantly ($p < 0.05$) higher weights in all edible organs compared with both N and F groups, this could be due to higher body or carcass weights. In contrast Al-Saigh and Al-Timmimi (5) found insignificant influence in the edible organs due to the level of feeding except the kidney fat and caudal fat which increased with an increase in the weight of the concentrate diet. Liver and lungs percentages of treated groups showed higher weights than those of the control group, this could be due to the high metabolites in the liver which caused higher weight and represent of high ratio of the carcass, In contrast Tahir (13) confirmed that the edible organs ratio decreased with age progress and the body weights increase in the lambs and kids respectively. Ramzi (11) found no differences in the weight of edible organs and their ratios when parsley seeds fed as feed additives and with or without vit E. administration of Karadi male lambs.

Rack joint dissected

The area of rib eye muscle and fat thickness of the treated groups showed significantly ($p < 0.05$) higher values than the control group (Table 3). Also the NF group showed significantly ($p < 0.05$) higher values than N and F groups. The same trend was observed in the lean and fat weight of the joint, while the bone weights of NF and control group significantly ($p < 0.05$) exceeded than N and F groups. The lean ratios of the treated groups significantly ($p < 0.05$) recorded higher values than the control group. Both NF and F groups recorded significantly higher ratios in the fat ratio compared with N and control groups, while bone ratio of the control group showed significantly ($p < 0.05$) higher values than the treated group.

The significant increase in the area of rib eye muscle of the supplemented groups compared with the control group, could be as a result of an increase in the muscle anabolism due to the protein content in both N and F seeds, also their content of vit C and E and other nutrients which cause an increase in food conversion efficiency and appetite (table 4). However, Al-Saigh and Al-Timmimi (5) reported that area of rib eye muscle increased when the level of alfalfa

among different groups, means at 5% level, according to Snedecor and Cochran (12).

RESULTS AND DISCUSSION

Body and carcasses weights

Live body weight, empty body weight, hot and cold carcass weights of NF group recorded significantly ($p < 0.05$) higher values than all other groups, the control group showed significantly ($p < 0.05$) lowest values in the hot and cold carcass weight (Table 1). The same trend was observed in the left half cold weight of the carcass.

Table 1: The effect of *Nigella sativa* and/or Fenugreek seeds contents in the diet on the live body weight, empty body weight, hot and cold carcass weight and their halves (Kg) of Awassi male lambs (means \pm SE)

Trait (kg)	Treatments				LSD Value
	N group	F group	NF group	Control	
Live body weight	37.12 \pm 1.0 b	37.62 \pm 1.02 b	42.5 \pm 1.55 a	33.50 \pm 1.75 b	4.20
Empty body weight	32.76 \pm 0.95 b	33.36 \pm 0.95 ab	36.65 \pm 0.86 a	30.05 \pm 1.72 b	3.58
Hot carcass weight	17.79 \pm 0.43 b	18.5 \pm 0.35 ab	19.85 \pm 0.44 a	16.37 \pm 0.65 c	1.49
Cold carcass weight	17.53 \pm 0.49 b	17.75 \pm 0.74 b	19.37 \pm 0.42 a	15.52 \pm 0.58 c	1.53
Right half Cold weight	8.91 \pm 0.26 a	8.93 \pm 0.36 a	9.78 \pm 0.18 a	7.78 \pm 0.46 c	1.02
Left half Cold weight	8.62 \pm 0.23 b	8.81 \pm 0.12 b	9.58 \pm 0.25 a	7.75 \pm 0.20 c	0.65

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

The differences in the live body weight and empty body weight at slaughter were due to using feed supplementation such as *Nigella sativa* and Fenugreek seeds, which have an effect on the hot and cold carcass weights, by an increasing the body weight, the carcass weight would be increased. Teixeira (14) and Mohammed (10) found as age progressed the hot and cold carcass weights increased with an increase in body weight, the same trend was reported by Ramzi (11) with Karadi lambs, however, all supplemented groups showed better body weight and hot and cold carcass weight than those of the control group. This might be due to the *Nigella sativa* and or Fenugreek seeds which caused an improvement in body weights, feed conversion efficiency, feed intake and total gain (table 4). By using *Nigella sativa* as feed additives, El-Gohary (7) and Gaber (8) found a significant increase in digestive coefficient of dry matter, organic matters, crude protein and crude fiber, so leads to an increase in growth rate, daily weight gain and cause an improvement in lamb meat taste (6). In addition fenugreek seeds contained high ratio of protein, vit C and E and flavonoides (3).

All these ingredients caused an improvement for in growth rate, body weight then carcass weight, while Gupta (9) observed that fenugreek seeds used for improving meat production. However, the NF group showed better improvement in body weight, hot and cold carcass weight than N and F groups, this could be due to the synergistic effect of both feed additives.

Edible parts percentage

The percentages of liver and lungs of the supplemented groups were significantly ($p < 0.05$) higher than that of the control group, while spleen, and

Al-Musawy (2) and Ramzi (11) established that feed additives in the diet cause an improving in carcass traits and weights. There are many studies carried out in Iraq about each these seeds individually but, no information is available on their combined effect as feed additives on carcass trait and measurement of lambs and their synergistic effects. Therefore, this study was aimed to study the effect of using 7.5% *Nigella sativa* and/or 7.5% Fenugreek seeds as a feed additives on carcass assessment of Awassi ram lambs.

MATERIALS AND METHODS

This experiment was conducted at animal farm, College of Veterinary Medicine, Baghdad University from 1/July/2009 to 28/ February/2010. Twenty Awassi ram lambs were bought at age of 4-5 months and body weight of 20-22 kg, from a trusted and familiar source. They were fed on concentrate diet at 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 started then they were precautional 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) as follows:

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

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

The animals were slaughtered toward the end of the study without fasting. Live weight was taken prior slaughtering, weights of hot carcasses were recorded, and carcass width and depth at the fifth ribs were measured. The weights of all organs or parts were recorded and their percentages were calculated. The empty body weights was calculated except the weight of the kidneys and kidney fat weights was taken after cooling. The carcasses were kept in a freezer (18°C) for 24 hours for cooling. Cold carcass weights were taken and percentages were calculated, the carcasses were dissected equally into two sides (left and right) and the cold weights of bodies were recorded, carcasses length of the right side (from the first rib up to the itch bone) was taken.

The right side was jointing and the weight of the joints were taken. The fat thickness and the area of rib eye muscle at the 6th rib of the rack joint were measured. Then the rack joints were dissected into bone (including cartilage), lean and fatty tissues were measured and their percentage of the right side weight of the carcasses and the percentages of the bone, lean and fat in the rack joints were calculated according to Al-Saigh et al (4).

Statistical Analysis:

The data were analyzed using complete randomized design. Least significant differences (LSD) was applied to detect the significant differences

**THE EFFECTS OF *Black cuming*, *Nigella sativa* AND /OR
FENUGREEK *Trigonella foenum graecum* SEEDS
SUPPLEMNTATIONS ON SOME CARCASSES
CHARACTERSTICS OF AWASSI LAMBS**

M.J.L. Al-Saady*
D.A. Abidamear ***

M.N.R. Al-Saigh **
S.B. Al-Aragi ***

ABSTRACT

This experiment was carried out at animal farm, College of Veterinary Medicine, Baghdad University from 1/July/2009 up to 28/ February/2010. Twenty Awassi lambs were equally divided into four group and each animal fed on a concentrate diet, 2%of body weight with grazing for 3-5 hours a day .The first group (C) was kept as control group, second group (N) was daily fed with concentrate diet contain 7.5% ground *Nigella sativa* seeds, third group (F) was daily fed with same level of concentrate diet contained 7.5% ground Fenugreek seeds, while fourth group (NF) was also fed with same amount of concentrate diet supplemented both ground *Nigella sativa* seeds+ground Fenugreek seeds (7.5% and 7.5% respectively)as group feeding. The results revealed that using *Nigella sativa* seeds or Fenugreek seeds as well as using both of them as a mixed feed supplemented with concentrate diet of Awassi ram lambs showed significant ($p<0.05$) increase in animal live body weights, empty body weight, hot and cold carcass weight. Carcass measurements of NF group also recorded significantly ($p<0.05$) higher than other groups, also carcass length and depth of both N and F groups showed significantly higher than the control group. Most edible parts in group NF as well as N and F group recorded significantly higher than the control group. The weight of joints and their percentages of group NF showed significantly ($p<0.05$) higher than the those of control, both N and F groups, showed significantly ($p<0.05$) higher values in most weights and percentages of the joints compared with the control group. The areas of rib eye muscles and fat thickness of treated groups showed significantly ($p<0.05$) higher than the control group, the same trend were observed in lean and fat weight and their percentages of the rack joint.

INTRODUCTION

Body weight is an index for carcass weight and dressing percentage (13). However, carcass composition determines the meat yield and meat sensorial trait, in this way body compositions would be determind by carcass economic value. Al-Saigh (4) and Teixeira (14) found that carcass weight increase. Al-Jassim (1) and Mahmood (10) found significant correlation coefficients among carcass measurements and the weight of the carcasses and body weight. Medicinal plants are widespread nowadays, due to their good effects for treatment of different diseases because of their active ingredients, *Nigella sativa* seeds considered as one of the most important medical plants which are used in the treatment the respiratory diseases and increase body activities, also Fenugreek seeds have particular important effects on the physiology of different organs and systems (3).

Part of Ph.D. thesis for the first author.

* State Company of Vet. -Ministry of Agric.- Baghdad,Iraq.

** College of vet. Medicine -Baghdad Univ. -Baghdad, Iraq.

*** College of Biotechnical -Baghdad Univ. -Baghdad,Iraq.