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PRODUCTIVE PERFORMANCE OF SEADI FATTENING LAMBS FED RATIONS CONTAINING EXTRUDED SOYBEAN SEEDS WITHOUT OR WITH SOME AROMATIC HERBS.

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SUMMARY

This study included three experiments, the first one (laboratory trial) was conducted to determine the effect of some aromatic herbs (3%) during storage periods on peroxide values (PV) and thiobarbutic acid (TBA), as indicator of rancidity in extruded soybean seeds (ESBS). The second experiment (feeding trial), twenty Seadi lambs of an average 24 Kg live body weight (LBW) and aged 4-5 months were randomly divided into four similar groups to study the effect of some aromatic herbs incorporated in partial ESBS- ration on lamb performance. Lambs were fed *ad lib.* on total mixed ration (TMR) consisted of 80% concentrate feed mixture (CFM) plus 20% clover hay without aromatic herbs (control, R1) or with the following aromatic herbs, 0.2% (3% 0f ESBS) for each of ground fennel seeds, ground rosemary seeds or ground thyme leaves for groups R2, R3 and R4, respectively. Feed intake and live body weight were recorded weekly then daily weight gain and feed to gain ratio were calculated. At the end of the experimental period, some blood and carcass traits were determined. The third experiment (digestion trial), three animals from each group were used to evaluate the nutrient digestibilities, nutritive value and rumen activity.

Values of PV and TBA increased as the storage period increased for all ESBS samples except those which contained aromatic herbs where the PV and TBA values were decreased. All aromatic herbs improved all nutrient digestibilities and nutritive value as TDN or DCP, except CP digestibility or DCP with R2 group. There were slightly differences in means of rumen parameters among the different experimental groups. Fennel and thyme increased DMI (1213 and 1245 g, respectively) whereas rosemary reduced DMI (1187 g) compared with control (1198g). Average daily gain was slightly higher in R3 and R4 (208 and 208 g/head/day, respectively), while it was lower in R2 (173g/head/day) compared with control (198 g/head/day). Feed conversion values (g DMI/g gain) were better with R3 and R4 (5.71 and 5.99, respectively) and worse with R2 (7.01) in comparison with R1 (6.05). Economic efficiency (relative daily profit, %) was better with R3 and R4 (108 and 104%, respectively) and worse with R2 (76%) compared with control group (100%). All aromatic herbs didn't significantly affect on carcass traits. Cholesterol and total lipids of blood were decreased with R2 and R3 compared to the other groups. Generally, the values of GOT and GPT were in a normal range.

Conclusively, it could be recommended to add either rosemary or thyme at a level of 0.2% (3% of ESBS) to fattening lamb rations containing extruded soybean seeds for achieving good performance and economic efficiency without adverse effects on animal health.

Keywords: aromatic herbs, nutrient digestibilities, performance, carcass characteristics, lambs.

INTRODUCTION

Including fats in ruminant rations can increase energy consumption and efficiency of feed utilization. Real increase in useful energy for ruminants depends on fat digestibility and on the effects of added fat on feed intake, digestibility and utilization. Also, more fat in rations has depressed fiber digestibility in sheep (Espinoza *et al.*, 1998).

In the recommendation of (NRC, 1994), use of fat supplements in ruminants rations has been limited to levels which do not induce metabolic changes in the rumen. The usual level of supplemental fat in ruminant rations is not more than 5%.

There are a large number of feed additives available for inclusion in animal rations to improve animal performance and can be used as antioxidants especially with ration containing high fat to reduce the oxidation potential in these rations. Recently, Ninfal *et al.* (2005) found that aromatic herbs like thyme, rosemary have the highest concentrations of phenolics and the highest oxygen radical absorbance capacity values. This lead to a significant increase in total plasmatic antioxidant capacity. These aromatic herbs utilized in many food products, have shown to be rich in rosemaric acid, a very potent antioxidant (Zheng and Wang, 2001).

The objectives of this research were: 1) to study the effect of aromatic herbs supplementation to extruded soy bean seeds to reduce its fat rancidity and increase its shelf life. 2) to evaluate the effect of using high fat in fattening lamb rations without or with aromatic herbs on productive performance of Seadi lambs.

MATERIALS AND METHODS

This research was carried out at Seds, Bany Soueif Governorate Research Station, Animal Production Research Institute (APRI) to study the effect of aromatic herbs on peroxide values (PV) and thiobarbutic acid (TBA), as indicator of rancidity in extruded soybean seeds (ESBS) and on fattening lamb performance.

The first experiment (laboratory trial) was conducted to determine the effect of storage periods on PV and TBA of ESBS without or with aromatic herbs. Samples of ESBS without aromatic herbs (control, T1) or with 3% each of ground fennel seeds (*Foeniculum vulgare*), T2; ground rosemary seeds (*Rosmarinus officinalis*), T3 and ground thyme leaves (*Thymus vulgaris*), T4 were stored for ten weeks at room temperature. Samples were analyzed weekly for PV, according to Morris and Jacob (1954) and TBA, according to Sidewell *et al.* (1954).

The second experiment (feeding trial) was conducted using twenty weaning Seadi lambs (averaged 24kg LBW and 4-5 months old) for 105 days to study the effect of addition same aromatic herbs to rations containing extruded soybean seeds on fattening lamb performance. Lambs were randomly divided into four similar groups (5 lambs for each). Animals were fed *ad lib.* total mixed ration (TMR) without (control, R1) or with 0.2% (3% of ESBS) of each ground fennel (R2), ground rosemary (R3) and ground thyme

(R4) . Total mixed rations were consisted of yellow corn, soybean meal, extruded soybean seeds, clover hay, limestone, common salt and minerals and vitamins mixture, as shown in Table (2). Water was continuously available in front of animals at all time. Feed intake and live body weight of animals were recorded weekly through the experimental period. Feed conversion (as g DMI/g gain, g TDNI/ g gain or g DCPI/g) and economic efficiency were calculated. At the end of the experimental period, animals were fasted for 12 hrs and blood samples were collected from jugular vein to determine some parameters of serum and liver function enzymes. Serum total lipids, cholesterol and (GOT & GPT) were determined according to Zollner and Krish (1962), Kostner *et al.* (1979) and Reitman and Frankel (1957), respectively. Hot carcass, offals and internal organs were separately weighed. The contents of digestive tract were removed and their weight was subtracted from the slaughter live body weight to obtain the empty body weight. The whole carcass was then cut into shoulder, hindquarter, loin, rack, neck and brisket. Samples were taken from 9, 10 and 11 rib cuts for determination of, lean, fat and bone percentage and chemical analysis (moisture, protein, ether extract and ash percentage) were done according to AOAC (1995). Area of rib eye was tracing onto calk paper placed over cut surface and measured by plane-meter.

The third experiment (digestion trial), four digestion trails were carried out to evaluate the nutrient digestibilities, nutritive value and rumen activity of the same different experimental rations. In each trial three adult sheep rams of about two years old and 50 Kg live body weight were used. Rams were fed the same TMR to cover the maintenance requirement according to NRC (1994) at 8 a.m. and 3 p.m. while water was available all time and determined. Feces was collected quantitatively once a day for each animal before the morning feeding. Feeds and feces samples were kept for later analysis according to AOAC (1995).

Rumen liquor samples were taken three times (0, 3 and 6 hrs) for each ram using stomach tube after collection period. Digital pH meter was used to determine of pH immediately. Ruminal ammonia-N was determined according to Conway (1957). Total VFA's were determined according to Warner (1964).

Data were statistically analyzed using the general liner model procedure, SAS (2000). Significant differences among means were tested by using Duncen's multiple range test (Duncen, 1955).

RESULTS AND DISSCUSION

Data in Table (1) showed that PV and TBA values increased as the storage period increased for all extruded soybean seeds (ESBS) samples. These results were in good agreement with Bergne *et al.* (1990) and Mahmoud (1998). However, adding aromatic herbs (fennel, rosemary and thyme) to ESBS samples decreased PV and TBA values by 26.1, 30.8 and 31.1 % for PV and by 48.6, 47.4 and 48.3 % for TBA, respectively. These results agreed with those reported by Ayed (1990), Mahmoud (1998) and Nielson *et al.* (1999) who suggested that this improvement may be due to the presence of some active constituents such as rosemaric acid.

Table (1): Changes of the PV and TBA values in extruded soybean without or with aromatic herbs during storage periods.

Storage period (week)	Control T1		Fennel T2		Rosemary T3		Thyme T4	
	PV	TBA	PV	TB	PV	TBA	PV	TB
0	4.8	0.35	4.8	0.23	4.8	0.22	4.8	0.22
1	10.5	0.97	8.20	0.68	8.50	0.65	8.20	0.66
2	11.4	1.04	8.90	0.89	9.20	0.90	8.80	0.90
3	12.0	1.40	10.0	1.04	10.3	1.09	9.20	1.07
4	15.2	1.82	11	1.10	10.5	0.12	9.80	1.11
5	18.0	1.95	12.5	1.19	11.7	1.17	10.5	1.15
6	21.0	2.00	15.7	1.23	13.5	1.25	13.1	1.23
7	27.0	2.50	16.5	1.25	15.4	1.26	15.8	1.25
8	32.0	2.60	18.2	1.30	18.0	1.32	17.5	1.30
9	34.0	3.2	20.5	1.50	21.0	1.52	20.2	1.5
10	37.0	3.50	27.33	1.80	25.6	1.84	25.5	1.81

PV = peroxide value, TBA = thiobarbutic acid

Data presented in Table (2) showed the chemical composition of the experimental rations. Results showed very slight differences due to the additions of aromatic herbs.

Nutrients digestibility and nutritive value:

Data of digestibility of nutrients of different experimental rations was presented in Table (3) showed that inclusion the tested aromatic herbs in ram rations resulted in an insignificant improvements in all nutrient digestibilities except CP with R2 group. The same trend was noticed with nutritive value as DCP being 10.0, 9.9, 10.5 and 10.0%, respectively for R1, R2, R3 and R4. Besides, there was a slight improvement in TDN with incorporating the aromatic herbs in ram rations being 81.4, 82.2, 81.8 and 82.3%, in the same order. were . These results were consistent with those obtained by Gaber *et al.* (1998), Abou-donia *et al.* (2000), El-Saadany *et al.* (2003) and Mohamed *et al.* (2003) who noticed that ewes fed (rosemary 150 mg/kg live body weight) had higher values of all nutrients digestibility than the control group. Recently, Sabbah *et al.* (2007), Mohi El-Din *et al.* (2008) and Mohamed *et al.* (2008) found adding *Majorena hortonismas* by-product to sheep ration at a level of 50-100 g/head/day improved ($P<0.05$) the nutrient digestibilities and nutritive value.

Rumen parameters:

Data concerning the values of ruminal pH, ammonia nitrogen (NH_3-N) and total volatile fatty acids (TVFA's) for the experimental animals are presented in Table (4). There was no significant ($P<0.05$) difference in pH value among the experimental rations at zero time. The results revealed higher ($P<0.05$) pH values at 3 hrs post feeding for R1, R2 and R3 compared to R4. The same trend was observed at 6 hrs post feeding. The results

also showed that means of pH's were lower with R3 and R4 than those R1 and R2, being 5.9 and 5.7 vs. 6.0 and 6.0. Nevertheless, Mohi El-Din *et al.* (2008) noticed an increase in ruminal pH with adding Kelp meal (*Ascophyllum nodosum seaweed*) at the level of 25 g/head/day for calves.

Table (2): Composition and nutrient contents of the experimental rations.

Item	Experimental rations			
	R1 Control	R2 Fennel	R3 Rosemary	R4 Thyme
Components, %				
Soybean meal	8.0	8.0	8.0	8.0
Extruded soybean	6.5	6.5	6.5	6.5
Yellow corn	63.2	63.0	63.0	63.0
Clover hay	20.0	20.0	20.0	20.0
Aromatic herbs	.....	0.2	0.2	0.2
Lime stone	1.0	1.0	1.0	1.0
Common salt	1.0	1.0	1.0	1.0
Minerals & vitamins mixture*	0.3	0.3	0.3	0.3
Nutrient content,%(DM basis)				
DM	91.02	90.30	91.42	90.78
OM	92.00	91.92	91.60	91.44
CP	14.37	14.45	14.38	14.38
CF	10.38	10.41	10.41	10.42
EE	5.46	5.48	5.48	5.47
NFE	61.79	61.58	61.33	61.17
ASH	8.00	8.08	8.40	8.56

* Minerals &Vitamins mixture per kg contained Co 0.1g, Cu 8g, Fe 35g, I 0.5g, Mn 35g, Se 0.6g, Zn 35g, vitamin A 20,000,000 IU, vitamin D_3 2,000,000 IU and vitamin E 2g.

Ruminal ammonia-N showed the lowest value before feeding then reached the maximum at 3 hrs post feeding and then reduced again after 6 hrs of feeding. On the other hand, the means of NH_3-N (mg/100ml rumen liquor) were higher with R3 (26.4) and lower with R2 and R4 (23.7 and 23.9) than that of R1 (26.0).

Concerning the TVFA's concentration (meq/100 ml rumen liquor), rams fed R2 recorded the lowest mean TVFA's concentration (10.8 meq/100 ml rumen fluid). While the highest mean was recorded with that group fed R4 (12.6 meq/100 ml rumen fluid). However, the differences among the different treatments were insignificant.

Table (3): Digestion coefficients and nutritive value of the experimental rations, % (DM basis).

Item	Experimental rations				±SE
	R1 Control	R2 Fennel	R3 Rosemary	R4 Thyme	
Apparent digestibilities, %					
DM	79.3	80.3	81.6	81.6	0.56
OM	81.8	82.4	83.1	83.4	0.86
CP	69.5	68.3	72.9	69.5	0.99
CF	61.5	64.9	62.9	63.2	0.69
EE	79.4	82.4	79.4	84.0	1.14
NFE	89.4	90.0	89.7	90.5	0.23
Nutritive value, %					
Total digestible nutrients	81.4	82.2	81.8	82.3	0.20
Digestible crude protein	10.0	9.9	10.5	10.0	0.14

Table (4): Effect of the experimental rations and sampling time on some rumen parameters

Item	Time of sampling (hrs)	Experimental rations				±SE
		R1 Control	R2 Fennel	R3 Rosemary	R4 Thyme	
pH	0	6.20	6.20	6.00	6.00	0.06
	3	5.90^{a}	5.80^{a}	5.70^{ab}	5.30^{c}	0.13
	6	6.00^{a}	5.90^{a}	5.90^{a}	5.70^{b}	0.06
	Mean	6.00	6.00	5.90	5.70	0.07
NH_3-N	0	18.7	14.8	17.0	15.2	0.89
	3	37.0	37.2	38.5	35.7	0.57
(mg/dl	6	24.9^{a}	19^{b}	23.7^{a}	20.7^{ab}	1.35
rumen	Mean	26.0	23.7	26.4	23.9	0.69
liquor)						
TVFA's	0	9.5	9.5	9.6	10.5	0.24
	3	12.3	11.9	12.4	14.4	0.56
(meq/dl rumen	6	11.2	11.1	11.5	12.8	0.39
liquor)	Mean	11	10.8	11.2	12.6	0.41

a, b, c.... means on the same raw with different super script are significantly ($P<0.05$) different.

Generally, adding aromatic herbs to lambs rations did not significantly affect on means of ruminal ammonia-N or TVFA's as compared to the control group. These results, were somewhat agreed with those reported by Mohi El-Din *et al.* (2008).

Growth performance and economic efficiency:

The average values of feed intake, daily gain, feed conversion and economic efficiency were shown in Table (5). Data revealed that the total DM intake was slightly increased with R2 and R4(1213 and 1245 g, respectively) and numerically decreased with R3 (1187 g) compared with control (1198 g). The average daily gain was higher for lambs in R3 and R4 (208 g/day in the both groups) and lower for R2 (173 g/day) compared with control (198 g/day). Similarly trend was observed for feed conversion as kg DMI/kg gain, being 5.71, 5.99, 7.01 and 6.05 for R3, R4, R2 and R1, respectively. This may be due to the improvement in both nutrient digestibilities and nutritive value. These results agree with those reported by Abou-Ammou and El-Hosseiny (1999), Sabbah *et al.* (2007) and Mohi El-Din *et al.* (2008) who found that addition 25 g/head/day of Kelp meal to calves ration gave higher feed intake and average daily gain than the control group.

Regarding the economic efficiency, the results in Table (5) also showed that relative feed cost, % increased as inclusion aromatic herbs in tested lambs rations (except R3, 96%) compared to the control group (100%). Besides, the best relative daily profit, % was better with lambs groups fed R3 and R4 rations (108 and 104%), while it was worse with that group fed R2 (76 %), compared to R1 (100%).

Carcass characteristics:

The slaughter data are given in Table (6). The average of fasting weight of R3 and R4 were higher than those of the other groups with no significant differences among them. In contrary, the lowest of fasting body weight was recorded with R2. Similar trend with respect of hot carcass weights was noticed among dietary treatments.

The pelt, head and legs weights did not show remarkable change among groups. Also, other offal's and organs (e.g. empty digestive tract, lungs, heart, liver, kidneys, spleen and tests) did not record any differences among treatments. The weight of empty digestive tract of control was higher than those of the other groups with no significant differences. This might be due mainly to lower digestion in this group. These results agree with those of Abou-Ammou and El-Hasseiny (1999) who reported that lambs fed rations containing Bio-tonic or Basporo did not differ from the control in all offals.

The warm carcass cuts presented in Table (6) showed that the values of the shoulder and hind quarter weights had no significant differences among the experimental groups, while lambs given rosemary and thyme recorded higher shoulder and hind quarter weights. Also, there were insignificant differences in rack weight among groups, while the control group had the highest value among them. The differences among groups for loin, neck, brisket and flank weights were insignificant. Besides, the lambs fed rosemary had higher loin, brisket and flank weights, while the lambs given fennel ration recorded the lowest loin weight. These results are in agreement with those reported by Abou-Ammou and El-Hasseiny (1999).

Table (5): Productive performance and economic efficiency of lambs fed the experimental rations.

Item	Experimental rations				±SE
	R1 Control	R2 Fennel	R3 Rosemary	R4 Thyme	
Body weight changes:					
Initial live weight, kg	22.40	23.00	23.60	25.20	0.60
Final live weight, kg	43.20^{ab}	41.20^{ab}	45.40^{a}	47.00^{a}	1.26
Total body gain, kg	20.80	18.20	21.80	21.80	0.85
Daily gain, g	198^{ab}	173^{ab}	208^{a}	208^{a}	8.26
Feed intake, g/head/day:					
DM	1198	1213	1187	1245	-
TDN	975	997	971	1025	-
DCP	120	120	125	125	-
Feed conversion, g/g gain:					
DM	6.05	7.01	5.71	5.99	-
TDN	4.92	5.96	4.67	4.93	-
DCP	0.61	0.69	0.60	0.60	-
Economic efficiency:					
Daily feed cost, LE	1.80	1.86	1.82	1.91	-
Feed cost, LE/kg gain	9.09	10.75	8.75	9.18	-
Relative feed cost,%*	100	118	96	101	-
Price of daily gain, LE	4.36	3.80	4.58	4.58	-
Daily profit, LE	2.56	1.95	2.76	2.76	-
Relative daily profit,%**	100	76	108	104	-

a, b, ... means on the same raw with different super script are significantly ($P<0.05$) different.

The price of total mixed ration / ton = 1500, 1530, 1530 and 1530 for R1, R2, R3 and R4, respectively.

The price of live body weight gain / Kg = 22 LE.

*Relative profit cost, % = Feed cost, LE/ Kg gain (R2 or R3 or R4) / R1.

**Relative daily profit, % = Daily profit, LE (R2 or R3 or R4) / R1.

Table (6): Effect of the experimental rations on carcass and offal's of lambs.

Item	Experimental rations				±SE
	R1 Control	R2 Fennel	R3 Rosemary	R4 Thyme	
Fasting wt(kg)	42.00	38.75	43.60	44.00	1.19
Carcass wt(kg)	21.57	18.59	22.28	22.75	0.94
Carcass offals:					
Pelt wt(kg)	5.550	6.330	6.370	5.071	00.31
G.I. full wt(kg)	6.190	6.330	6.360	6.950	00.16
G.I. empty wt(kg)	2.700	1.830	2.39	2.383	00.18
Rumen content wt(kg)	3.487	4.494	3.977	2.575	00.41
Head wt(kg)	2.500	2.440	2.44	2.830	00.09
Four Legs wt (kg)	1.032	0.997	1.128	1.312	00.07
Liver wt(g)	592.5	787.5	584.8	581.0	50.40
Kidney wt(g)	121.5	98.50	121.2	119.0	05.54
Testes wt(g)	502.5	514.0	602.4	535.0	22.34
Spleen wt(g)	71.00	68.50	67.4	73.00	01.25
Heart wt(g)	225.0	208.0	215.6	245	07.99
Lungs wt(g)	530.0	479.0	566.0	572.5	21.43
Carcass cuts:					
Shoulder wt. (Kg)	4.010	3.860	4.230	4.620	00.16
Hind Quarter	6.770	6.140	6.860	7.080	00.20
Rack wt(kg)	5.080	4.110	4.890	4.890	00.22
Loin wt(kg)	1.390	1.200	. 1.507	1.480	00.08
Neck wt(kg)	1.550	1.520	1.386	1.880	00.10
Brisket wt/kg	0.860	0.830	1.160	0.950	00.07
Flank wt(kg)	1.210	0.898	1.570	1.450	00.14

Table (7): Effect of the experimental rations on fat distribution in the all carcass.

Item	Experimental rations				±SE
	R1 Control	R2 Fennel	R3 Rosemary	R4 Thyme	
Tail wt/ Kg	0.936	0.981	1.560	1.530	00.17
Kidney fat/g	187.0	137.0	141.2	164.5	11.57
Internal	587.0	430.0	700.0	636.0	57.60
Total body	1.715	1.552	2.399	3.334	00.40
Fat % *	4.15	3.93	5.51	5.65	00.44

* Fat % = total fat/ slaughter wt. * 100

Data in Table (7) showed the values of deposit body fat. It was clearly that the weight of internal and kidney fat was not significantly differed due to the aromatic herbs inclusion in the rations. The lambs fed fennel had the lowest weight of internal fat (430g) and those fed rosemary ration recorded the highest value (700g). While, the control group recorded the highest weight of kidney fat and the lowest was with R2 group. The values of tail weight were 0.936, 0.981, 1.560 and 1.530 kg for R1, R2, R3 and R4, respectively. The fat percentage relative to slaughter weight was 4.15, 3.93, 5.51 and 5.65 for R1, R2, R3 and R4, respectively. These results are agreement with those reported by Abou-Ammou and El-Hasseiny (1999).

Table (8): Effect of the experimental rations on carcass characteristics section and chemical analysis.

Item	Experimental rations				±SE
	R1 Control	R2 Fennel	R3 Rosemary	R4 Thyme	
*Dressing A %	51.35	47.97	51.10	51.71	20.86
**Dressing B	56.02	53.85	55.67	57.11	00.68
***Prim cuts %	0.803	0.843	0.948	0.800	00.03
Total fat	1.715	1.552	2.399	3.334	00.40
Sample, g	622.0	542.5	571.6	697.0	33.83
L.D Area cm^2	15.80	16.00	16.00	17.50	00.39
L.D Index	0.700	0.656	0.720	0.817	00.03
Lean, g	306.0	271.0	287.2	364.0	20.30
Fat, g	202.0	150.0	161.2	217.5	16.11
Bone, g	98.50	107.0	109.2	112.0	02.91
Lean %	50.41	50.23	50.23	50.65	00.09
Fat %	30.33	27.78	28.04	32.45	01.09
Bone %	16.47	19.32	19.38	16.45	00.83
Chemical					
Moisture	73.88	73.55	72.98	73.10	00.20
Dry matter	26.15	26.45	27.02	26.90	00.20
Crude protein	68.45	65.55	69.36	65.28	01.02
Ether extract	28.05	30.50	27.34	31.10	00.91
Ash	3.530	2.95	3.300	3.650	00.15

* Dressing A= carcass (wt)/ fasting (wt) *100

**Dressing B= carcass (wt)/ fasting (wt)- (rumen content) (wt)* 1 00

*** Prime cuts =Shoulder +H.Q +Loin +rack (wt) / carcass (wt)*100

The dressing percentages, carcass sections and chemical analysis of 9, 10 and 11 rib cuts for different groups are presented in Table (8). It could be observed that dressing percentage either relative to fasting weight or empty body weight was not affected by dietary treatments. These results coincided with those reported by Houria and Omar (1994) and El-Hoimmosi and Abd El-hafiz (1979) who found that increasing energy content in Ossimi lambs ration led to a rise in dressing percentage. Similarity, prime cuts % (loin, shoulder, hind quarter and rack relative to carcass weight) and percentages of different carcass components of 9, 10 and 11 rib cuts were not affected significantly by the different treatments.

The percentages of different carcass components of 9, 10 and 11 rib cuts were found had no significant differences among groups in lean, fat and bone weights. While the lambs feed fennel ration had recorded the lowest value of fat % (27.78) and the lambs fed thyme additive ration had the highest value (32.45%).

Table (9): Effect of the experimental rations on some blood parameters.

Item	Experimental rations				±SE
	R1 Control	R2 Fennel	R3 Rosemary	R4 Thyme	
Total lipids, mg/ dl	333.3	304.1	278.1	362.5	18.23
Total cholesterol, mg/	62.40^{ab}	49.58^{b}	48.65^{b}	73.77^{a}	05.95
GOT, U/ dl	52.25	54.25	76.00	76.00	06.58
GPT, U/ dl	6.75	7.25	6.00	6.67	00.25

a, b .... means on the same raw with different super script are significantly (P<0. 05) different.

The control group had lower longissimuse dorsi (L.D) area than the other groups, while group 4 (thyme) had the highest value over the experimental treatments and the differences were insignificant.

Concerning the chemical composition of 9, 10 and 11 rib cuts section of the experimental lambs, there were insignificant differences among treatments in moisture, ash and protein percentage. However, the ether extract percentage was highest with R4 group (31.10%) and the lowest was with R3 group (27.34%). Besides, the differences in ether extract content among the different treatments were insignificant. These results agreed with those reported by Abou-Ammou and El-Hosseiny (1999) who found that growth promoter's additives did not affect on the chemical analysis of L.D.

Blood parameters:

The effects of addition different aromatic herbs to lambs rations on some serum constituents are shown in Table (9). It could be noticed that there was insignificant decrease in total lipids and cholesterol concentrations in R2 and R3 groups compared to the control group. These findings are supported with those reported by Sabbah *et al.* (2007) and El-Saadany *et al.* (2008). While the values were insignificant higher with R4. These increases may be due to the beneficial role of thyme in promoting the absorption of fat (Teodorovic *et al.*, 1990 and El-Shenawi., 1992). Neverthless, Ibrahim *et al.* (2000) and

Abd El-Mageid (2003) found that feeding on thyme reduced serum total lipids. Values of GOT were insignificants higher for R2, R3 and R4 than that of the control. On the other hand, there were insignificant differences in GPT among the tested four animal groups. These results are in good agreement with those of Mohamed *et al.* (2003) and Mohi El-Din *et al.* (2008). Generally no abnormal values regarding the blood parameters were detected to feeding aromatic herbs.

Conclusively, according to the circumstances of this study, it could be recommended to add either ground rosemary seeds or ground thyme leaves at a level of 0.2% (3% of ESBS) to fattening lamb rations containing extruded soybean seeds for achieving good performance and economic efficiency without adverse effects on animal health.

REFFERENCES

Abd El-Mageid, H. A. (2003). Effect of certain medicinal plants on the performance of growing rabbits. Msc.thesis Animal Production Department. Faculty of Agriculture, Cairo University.

Abou-Ammou, F.F. and Hoda M. El-Hosseiny (1999). Performance and carcass characteristics of lambs fed Bio-tonic and Baspora as feed additives in summer and winter seasons. Egyptian J. Nutrition and feeds, 2 (Special Issue):57.

Abou-Donia, F. M. A.; A. A. Abdel El-Aziz and G. H. Zaza (2000).Effect of using extruded soybean seed on growth performance of buffalo calves. .3rd All Africa Conference on Animal Agriculture and 11th conference of the Egyptian Society of Animal Production, Egypt.

A.O.A.C. (1995). Official methods of Analysis, 15th Ed. Association of Official Analytical Chemists., Washington, Virginia, U.S.A.

Ayed, S. A. (1990). Role of some aromatic herbs in extended the stability of sheep during accelerated storage. Egyptian J. Dairy Sci., 18: 335.

Berghe, C.H.; P.O. Ahouangninou and E.E. Deka (1990). The effect of antioxidants and mould inhibitor on feed quality and the performance of broiler under tropical. Science, 30:5.

Conway, E.F. (1957). Micro diffusion analysis and volumetric error. Rev. Ed. Lockwood, London.

Duncan D.B (1955). Multiple range and multiple F-tests. Biometrics, 11:1.

El-Hommosi, F. F. and G.A. Abdel- Hafiz, (1979). Effect of different concentrate levels in diets of Ossimi lambs. II-Physical and chemical characters of carcass. Assiut Vet. Med. J.,6:75.

El-Saadany, S.A.; A.M.M. Zeid; A.M.A Mohi El-Din and T.I. El-Monayer (2003). Impact of using different feed additives on the performance of lactating Friesian cows. Egyptian J. Nutrition and feeds, 6 (Special Issue):551.

El-Saadany, S.A.; A.A.M. Habeeb; E.S. El-Gohary; M.M. El-Deeb and K.M. Aiad (2008). Effect of supplementation of Oregano or Nigella stiva seeds to diets of lactating

Zaraibi goats on milk yield and some physiological functions during summer season. Egyptian J. Anim. Prod., 45 (Suppl. Issue):469.

El-Shenawi, A. (1992). Medicate by herbal. Text Book, El-Eman Library, El-Mansoura, Egypt.

Espinoza, J.L.; Lopez-Molina; J.A.Ramirez-Godinez; J. Jimenez; A. Florez; O.L.Molina and J.R.Godinez (1998). Milk composition, postpartum reproduction activity and growth of lambs in pelibuey ewes fed calcium soaps of long chain fatty acids. Small Ruminants Research, 27:119.

Gaber, A.A.; S.A. El- Ayouty; A.A. Azki; F.F. Abou-Ammou and E.S.I. El-Gohary (1998). Productive performance of lambs feed diets containing *Niglla sativa* meal. Egyptian J. Nutrition and feeds, 1:97.

Houria M.A. and S.S. Omar (1994). Body performance and carcass characteristics of culled Ossimi ewes subjected to different finishing periods. Egyptian J.Anim. Prod. 31:337.

Ibrahim, S.A.M., A.A. El-Ghamry and G.M. El-Mallah (2000). Effect of some medical plans of labiatae family as feed additives on growth and metabolic changes of rabbits. Egyptian J. Rabbit Sci., 10:105.

Kostner,G.M.;P.Avogaro;G.Bittolo Bone;G.Cazzolato and G.B.Quinci (1979). Determination of high-density lipoproteins: Screening methods compared.Clin. Chem. 25(6): 939.

Mahmoud, H.A. (1998). Comparative studies of the use of some agriculture by-products and chemical antioxidant in the storage of feed. M.Sc.thesis. Department of Biochemistry. Faculty of Agriculture. Ain Shams University.

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 parameter in sheep. Egyptian J. Nutrition and feeds 6:139.

Mohamed, K.I.; A.H. Mohamed and Safa Nady (2008). Influence of *Majurana hortonsimas* by-product as feed supplementation on ewes milk production and the growth performance and their offspring. Egyptian J. Anim. Prod., 45 (Suppl. Issue):519.

Mohi El-Din, A.M.A; H.M.A. Gaafar; H.M El-nahas; E.E. Ragheb and A.F. Mehrez (2008). Effect of natural feed additives on performance of growing Frisian calves. Egyptian J. Anim. Prod., 45 (Suppl. Issue):401.

Morris, B. and J. Jacobs (1954). The chemical analysis of food and food byproducts 2nd Ed. D. Van Nostrand Company. New York.

Nielson S. E.; J. F. Young; B. Daneshvar; S. T. Lauridsen; P. Knuthsen; B. Sandstrom and L. O. Dragsted (1999). Effect of parsely (*Petraselinum crispum*) intake on urinary excretion, blood antioxidant enzymes and biomarkers for oxidative stress in human subjects. British J. Nutrition, 81:447.

Ninfali, P.; G. Mea; S. Giorgini; M.Rocchi and M.Bacchiocca (2005) Antioxidant capacity of vegetables, spices and dressings relevant to nutrition. British J. Nutr.,

93:257.

N.R.C (1994). Nutrient requirement of sheep. Academy of Sciences. National Research Council, Washington, D.C., U.S.A.

Reitman, S. and S. Frankel (1957). Colorimetric determination of AST and ALT activity. Amer. J. Clin. Path., 28:56.

Sabbah M. Allam; H.M. El- Banna and Randa R.E. El-Elamie (2007). Performance of Zaraibi kids fed diets supplemented with medical herbs. Egyptian J. Nutrition and feeds, 10 (Special Issue):349.

SAS, (2000). SAS user guide: Statics, SAS institute., Cary N.C., USA.

Sidwell, C.G.; S. Harold; B. Midada and T.H. Mitchell (1954). The use of thiobarbutric acid as measure of fat oxidation. J. Amer. Oil Chem., 31: 603.

Teodorovic, M.; A. Sreckovic; G. Tot; F. Kajari and L. Dragic (1990). Efficacy of Fito-diaro-stop in treating and preventing diarrhea in piglets. Veterinary Glasnik, 44:681.

Warner, A. C. I. (1964). Production of volatile fatty acids in rumen: methods of measurement. Nutr. Abst. And Rev. 34:339.

Zheng W. and S. Wang (2001). Antioxidant activity and phenolic compounds in selected herbs. J. Agric Food Chem. 49:5165.

Zollner, N. and K. Krisch (1962). Z. ges. Exp. Med., 135-545.

الأداء الانتاجى للحملان الصعيدى المسمنه المغذاه على علائق تحتوى بذور فول الصويا المبثوقة بدون أو باضافة بعض الاعشاب العطرية.

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تشمل هذه الدراسة ثلاثة تجارب : الاولى (تجربة معملية) اجريت لدراسة تأثير فترات التخزين على رقمى (PV , TBA) دليلا على التزنخ فى بذور فول الصويا المبثوقة (ESBS) بدون او باضافة بعض الاعشاب العطرية (٣%). التجربة الثانية (تجربة تغذية لمدة ١٠٥ يوم) استخدم فيها ٢٠ حولى صعيدى (بمتوسط وزن ٢٤ كجم وعمر ٤- ٥ اشهر) والتى قسمت عشوائيا لاربع مجموعات متماثلة ، لدراسة تأثير اضافة بعض الاعشاب العطرية فى العلائق التى تحتوى بذور فول الصويا المبثوقة على ادائها الانتاجى ، حيث غذيت هذه الحملان للشبع على عليقة متكاملة تتكون من ٨٠% مخلوط علف مركز مع ٢٠% دريس البرسيم بدون اضافة (كنترول - مجموعة ١) او باضافة ٠،٢% (٣% من بذور فول الصويا المبثوقة) من كل من مطحون بذور الشمر و مطحون بذور حصى البان و مطحون أوراق الزعتر للمجموعات الثانية والثالثة والرابعة على التوالى ، وسجل اسبوعيا كل من الغذاء المأكول ووزن الجسم الحى ، ثم حسب كل من الزيادة اليومية فى وزن الجسم ومعدل التحويل الغذائى ، وعند نهاية فترة التجربة قدرت بعض قياسات الدم و الذبيحة. التجربة الثالثة (تجربة هضم) لتقدير معاملات هضم المركبات الغذائية والقيمة الغذائية ونشاط الكرش لنفس العلائق التجريبية ، وكانت النتائج المتحصل عليها على النحو التالى :

١- زيادة رقمى (PV,TBA) فى عينات بذور فول الصويا المبثوقة بزيادة فترة التخزين (دليلا على حدوث التزنخ)، ونقصهما باضافة بعض الاعشاب العطرية.

٢-زيادة معاملات هضم جميع المركبات الغذائية والقيمة الغذائية في صورة مركبات غذائية مهضومة كلية و بروتين خام مهضوم (عدا معامل هضم البروتين الخام و البروتين الخام المهضوم مع المجموعة الثانية).

٣- لم تكن هناك فروقا معنويه فيما بين المجموعات التجريبية الاربعه بالنسبة لقيم متوسطات مقاييس الكرش المختلفة.

٤- زيادة المأكول من المادة الجافة للمجموعتين الثانية والرابعة (١٢١٣، ١٢٤٥) وانخفاضه للمجموعه الثالثة (١١٨٧) مقارنه بمجموعة الكنترول (١١٩٨ جم/رأس/يوم) .

٥- ارتفاع معدل الزيادة اليوميه للمجموعتين الثالثة والرابعة (٢٠٨، ٢٠٨) وانخفاضه للمجموعه الثانية (١٧٣) مقارنه بمجموعة الكنترول (١٩٨ جم) .

٦- كان معامل التحويل الغذائى (جم مادة جافة مأكولة / جم نمو) اكثر كفاءة للمجموعتين الثالثة والرابعة (٥،٧١، ٥،٩٩) واقل كفاءة للمجموعه الثانية (٧،٠١) مقارنة بمجموعة الكنترول (٦،٠٥) .

٧- كان معدل الكفاءة الاقتصادية اكثر كفاءة للمجموعتين الثالثة والرابعة(١٠٤، ١٠٨%) واقل كفاءة للمجموعه الثانية (٧٦%) مقارنه بمجموعة الكنترول (١٠٠%).

٨- لم تكن هناك فروقا معنويه بين المجموعات التجريبية الاربعة بالنسبة لقياسات الذبيحة .

٩- انخفاض الكولسترول وليبيدات الدم الكلية فى المجموعات التجريبية الثانية والثالثه مقارنه بالمجموعتين الأخرتين و عموما كانت قيم GPT, GOT في الحدود الطبيعية.

طبقا لنتائج هذه الدراسة، يمكن ان نوصي بإضافة مطحون بذور حصى البان او مطحون أوراق الزعتر بنسبة ٠،٢%(٣% منESBS) لعلائق الحملان المسمنة المحتوية بذور فول الصويا المبثوقة لتحقيق اداء انتاجي و كفاءة اقتصادية جيدة دون اي تاثيرات سلبية علي صحة الحيوان.