

## RESPONSE OF GROWING TURKEY TO SOME MEDICINAL PLANTS AS NATURAL GROWTH PROMOTERS

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### ABSTRACT

This experiment was conducted to evaluate the effect of adding some medicinal plants as natural growth promoters such as: sweet basil, oregano, peppermint, thyme and their mixture, at 1.0% to turkey diets on performance and some metabolic functions. A total of ninety healthy Broad Breasted Bronze (BBB) turkey males aged 12 weeks were randomly assigned into six iso-caloric, iso-nitrogenous diets. Each diet was fed to three replicates, each containing five birds, during 12-24 week of age. Each treatment of the tested diets contained one source of the tested medicinal plants, while the control diet had no additives.

Results showed that the inclusion of these medicinal plants in turkey diets improved the live body weight, body weight gain, feed consumption and feed conversion compared with control group. The birds fed dietary sweet basil recorded the highest ( $p < 0.05$ ) values of growth performance traits. While, the control group recorded the worst feed conversion value. Also, the addition of medicinal additives improved the most digestibility coefficients and the highest values of organic matter, crude protein, crude fiber and nitrogen free extract digestibility were recorded by the group of birds fed diet contained sweet basil.

The results of slaughter traits showed no significant differences among treatments for dressing, giblets, gizzard and liver, while significant differences were observed for heart, total edible parts, feather and total inedible parts (as percentage of live body weight). The turkey group fed diet contained 1.0% sweet basil recorded the lowest value of heart % as compared to the control group. However, the lowest value of total edible parts % was recorded by oregano fed group. Blood plasma parameters showed an improvement in total protein, albumin and globulin and a decrease in total lipids, cholesterol and liver function enzymes in all treatment groups.

It could be concluded that, using dietary sweet basil, oregano, peppermint, thyme and their mixture, at dietary 1.0% as natural growth promoters improved growth performance, nutrients digestibility, blood parameters and economic efficiency of growing turkey during the period from 12 to 24 weeks of age.

### INTRODUCTION

Many trials have been undertaken to improve the growth, feed conversion efficiency and reduce the cost of feeds by addition of dietary supplementation such as, enzymes (Makled, 1993 and Hattaba *et al.*, 1994), antibiotics (Younis, 1987), probiotics (El-Gindi *et al.*, 1999) and herbal extracts, probiotic and enzymes (Radwan *et al.*, 1995).

The medicinal plants such as: Sweet basil (*Ocimum Basilicum*), Egyptian oregano (*Origanum Vulgare*), Thyme (*Thymus Vulgaris*) and Peppermint (*Mentha Piperita*) are a numerically large group of economically important plants. They include various species, which are used in the treatment of various diseases. These plants not only has a medicinal effect

but also contain aromatic substances and essential oils used in food industries. The most important constituents in these plants are Menthol and several other components that are used not only in foods, but also in most kinds of cosmetics (Rinzler, 1990); Anethole in sweet basil oil which showed anti-microbial activity against bacteria, yeasts and moulds (Lachowicz *et al.*, 1998); Carvacrol in Egyptian oregano oil, it is markedly has an inhibitory effect against 25 bacterial and 5 fungal species (Deans and Svaboda, 1990) and Thymol in thyme oil (Rinzler, 1990).

Medicinal plants as natural growth promoters had significant improvement of body weight, weight gain, mortality rate and feed conversion, Abdel-Malak *et al.*, (1995); Ibrahim *et al.*, (1998) and Tollba (2003) with broiler; Ghazalah and Ibrahim (1996) with ducks and Abd El-Latif *et al.*, (2002) with Japanese quail. Some vegetable herbs edible plant and seeds are used as natural tonic and restoratives (Boulos, 1983).

The present study was designed to evaluate the utilization of some medicinal feed additives as growth promoters (Peppermint, Sweet basil, Oregano and Thyme) in growing turkey poult and their effects on growth performance, digestibility and carcass characteristics.

## **MATERIALS AND METHODS**

The experimental work was carried out at the Animal Production Department, National Research Centre, Cairo.

A total of ninety healthy Broad Breasted Bronze (BBB) turkey males aged 12 weeks were randomly assigned into six iso-caloric, iso-nitrogenous diets. Each diet was fed to three replicates, each containing five birds during 12-24 week of age.

The basal control diet contained adequate levels of nutrients for growing turkey diet as recommended by the National Research Council (NRC, 1994). The first group was fed the basal diet (Table 1) only without supplements and served as a control (T1). The other groups were fed the basal diet +1.0% dried pepper mint leaves (T2), the basal diet +1.0% dried marjuran leaves (T3), the basal diet +1.0% dried sweet basil leaves (T4), the basal diet +1.0% dried leaves (T5) and the basal diet +1.0% mixture of all dried leaves of these medicinal plants with a ratio of (1:1:1:1) (T6). All experimental groups were kept under the same environmental conditions. Feed and water were offered *ad-libitum*. The birds were individually weighed at 12, 16, 20 and 24 week of age, and at the same ages, feed intake was recorded and feed conversion ratio was calculated. At the end of experiment, 3 birds from each treatment were housed in separate metabolism cages for 5 days to determine the digestibility coefficients. Birds were allowed the experimental diets for two days as preliminary period followed by 3 days as a main experimental period during which the excreta was quantitatively collected.

**Table (1): Composition and calculated analysis of the basal diet.**

Ingredients %	%
Yellow corn	60.3
Soybean meal (44%)	21.0
Protein concentrate (52%)*	10.0
Wheat bran	7.1
Limestone	1.0
Bone meal	0.1
NaCl	0.3
Di- Methionine	0.1
Coccidostat	0.1
Total	100
<b>Calculated analysis :</b>	
Crude protein (%)	20.86
Metabolizable energy (K cal/Kg)	2800
Lysine (%)	1.26
Methionine (%)	0.50
Calcium (%)	1.00
Available P. (%)	0.44

\*Protein concentrate contain: 52% crude protein, 1.57% crude fiber, 6.17% ether extract, 7% calcium, 3.5% available phosphorus, 1.52% methionine, 2.11% methionine and cystine, 2.98% lysine, 2416 K cal/kg metabolizable energy.

Also, each 1 kg Broiler concentrate contain : 12000 IU vitamin A acetate; 21000 IU vitamin D3; 100 mg vitamin E acetate; 21 mg vitamin K3; 10 mg vitamin B1; 40 mg vitamin B2; 15 mg vitamin B6; 100 ug vitamin B12; 100 mg pantothenic acid; 200 mg nicotinic acid; 10 mg Folic acid; 500 ug Biotin; 500 mg choline; 50 mg Copper; 5 mg Iodine; 300 mg Iron; 600 mg Manganese; 450 mg Zinc, 1 mg Selenium, 1250 mg anti-oxidant, 2500 mg coccidiostats, and 100 mg growth promoters

At 24 weeks of age , three birds from each feeding group were randomly taken, fasted for 12 hours, weighed and slaughtered and some of carcass traits were estimated. Blood samples (10 ml) were obtained from wing vein of three birds of each treatment and centrifuged at 3500 rpm for 15 minutes. The plasma produced was frozen at -20°C until analysis. Plasma total protein (TP), albumin (ALB), total lipids (TL), cholesterol (CHOL), glutamic pyruvic transaminase (GPT) and glutamic oxalacetic transaminase (GOT) were estimated by using commercial kits purchased from Bio-Merieux (Merckyl Etiols Charbon Mierels Rains/France). While, globulin and albumin; globulin ratio (A/G) were calculated.

The proximate analyses of diets, dried excreta and meat were carried out according to the official methods of A.O.A.C.(1990). Faecal nitrogen was determined following the procedure outlined by Jakobsen *et al.* (1960).

Cost of one kilogram feed and cost of feed/kg gain were calculated based on the prices of the tested feed additives and feed ingredients prevailing 2002.

Data were statistically analyzed using one-way analysis of variance and Duncan's multiple range test was used for comparison between means (SAS,1998).

## RESULTS AND DISCUSSION

### **Productive Performance:**

Obtained results of the productive performance are presented in Table(2). Results showed that the inclusion of the tested feed additives in turkey diets improved significantly ( $p < 0.05$ ) the live body weight, body weight gain, feed consumption and feed conversion compared with experimental group fed on unsupplemented control diet. Similar trend was observed by Ibrahim et al. (2000) who found that 0.5% dried leaves of either sweet basil, thyme, oregano, catnip, pepper mint and 1 : 1 mixture, as well as, 1.0% of market herbal extraction biotonic improved productive performance without any harmful effects, in growing rabbits.

The results also showed that the birds fed dietary sweet basil (T4) recorded the highest ( $p < 0.05$ ) values of growth performance traits. This improvement may be due to the high content of beta carotene and vitamin A in sweet basil, as reported by Rinzier. (1990) that, one kilogram ground basil has 93571 IU. of vitamin A, which may protect the body cells against the risk of any free radical, infection and bacteria. Also Kolacz et al. (1977) found that feeding sweet basil was effective in promoting weight gain compensation in weaned pigs suffering from runtting syndrome. Kusamran et al. (1998) added that sweet basil has a good metabolic activity of chemical carcinogens in rats and abilities as a blood glucose regulator.

In general, the improve of growth performance for birds fed dietary medicinal plants may perhaps due to the high level of iron in thyme or high energetic value (calories) of oregano as reported by Rinzier (1990). On the other hand, Aruome et al. (1996) and Botsoglou et al. (1997) reported that thymol extract showed good antioxidant activity. Also, Tollba (2003) reported that the addition of natural additives such as grounds of either thyme or fennel at level of 1% in broiler diet has the best effects to improve their performance.

The results of growth performance in the mixture of all tested medicinal plants (T6) may be due to the several amounts of effective components as anethol, thymol and carvacrol (in oregano). Similar results were obtained by Abdel -Malak et al. (1995) who reported that increasing biotonic level, up to 1000 gm / ton, as supplementation in broiler chicken diets improved body weight. However, feed conversion was not significantly affected.

Mortality rates during the period from 12 to 24 weeks of age were found 1/15 for both groups fed diets contained 1.0% oregano and 1.0% mixture (1:1), respectively. However, the mortalities reported in this experiment were due to accidents and not to either diseases or treatments.

**Table (2): Effect of experimental diets on performance of growing (BBB) turkey.**

Item	Control	1.0% peppermint	1.0% Oregano	1.0% Sweet basil	1.0% Thyme	1.0% Mix
<b>Body weight:</b>						
12 Weeks (g)	2909.92 ±19.15	2919.58 ±27.06	2910.83 ±13.39	2902.50 ±26.70	2900.75 ±22.01	2902.92 ±12.71
16 Weeks (g)	4172.92 ±61.49	4233.33 ±27.08	4168.33 ±67.08	4327.08 ±65.09	4295.83 ±67.06	4245.83 ±51.20
20 Weeks (g)	5289.58 <sup>b</sup> ±58.00	5373.75 <sup>a</sup> ±45.95	5439.58 <sup>a</sup> ±72.20	5513.75 <sup>a</sup> ±70.96	5439.58 <sup>a</sup> ±71.66	5393.75 <sup>a</sup> ±34.42
24 Weeks (g)	6408.33 <sup>c</sup> ±41.87	6558.33 <sup>abc</sup> ±61.70	6514.58 <sup>abc</sup> ±59.99	6670.83 <sup>a</sup> ±78.76	6602.08 <sup>ab</sup> ±21.75	6450.00 <sup>bc</sup> ±25.00
<b>Body weight gain:</b>						
12-16 Weeks (g)	1263.00 ±79.74	1313.75 ±38.14	1257.50 ±80.45	1424.58 ±38.47	1395.08 ±74.97	1342.92 ±45.59
16-20 Weeks (g)	1116.67 ±11.60	1140.42 ±59.06	1271.25 ±138.77	1186.67 ±49.68	1143.75 ±9.55	1147.92 ±47.65
20-24 Weeks (g)	1118.75 ±70.44	1184.58 ±83.05	1075.00 ±61.66	1157.08 ±9.28	1162.50 ±58.07	1056.25 ±44.34
12-24 Weeks (g)	3498.42 <sup>c</sup> ±49.29	3638.75 <sup>abc</sup> ±69.33	3603.75 <sup>abc</sup> ±52.10	3768.33 <sup>a</sup> ±64.94	3701.33 <sup>ab</sup> ±42.61	3547.08 <sup>bc</sup> ±36.02
<b>Feed consumption:</b>						
12-16 Weeks (g)	4321.00 <sup>ab</sup> ±135.75	4382.00 <sup>ab</sup> ±52.65	4411.00 <sup>ab</sup> ±36.94	4520.00 <sup>a</sup> ±94.88	4405.00 <sup>ab</sup> ±105.51	4180.00 <sup>b</sup> ±70.52
16-20 Weeks (g)	4669.00 <sup>ab</sup> ±74.22	5024.00 <sup>a</sup> ±129.59	4734.00 <sup>ab</sup> ±200.11	4921.00 <sup>ab</sup> ±123.32	4740.00 <sup>ab</sup> ±101.12	4550.00 <sup>b</sup> ±67.45
20-24 Weeks (g)	5924.00 ±412.48	5643.00 ±131.47	5840.00 ±138.57	5610.00 ±47.71	5743.00 ±319.20	5200.00 ±173.28
12-24 Weeks (g)	14614.00 <sup>ab</sup> ±412.95	15049.00 <sup>a</sup> ±125.01	14985.00 <sup>a</sup> ±145.26	15051.00 <sup>a</sup> ±89.04	14888.00 <sup>a</sup> ±330.01	13930.67 <sup>b</sup> ±147.94
<b>Feed conversion (feed/gain):</b>						
12-16 Weeks	3.44 <sup>ab</sup> ±0.12	3.34 <sup>ab</sup> ±0.08	3.53 <sup>a</sup> ±0.20	3.17 <sup>ab</sup> ±0.02	3.17 <sup>ab</sup> ±0.09	3.12 <sup>b</sup> ±0.05
18-20 Weeks	4.18 <sup>ab</sup> ±0.04	4.42 <sup>a</sup> ±0.13	3.78 <sup>b</sup> ±0.25	4.16 <sup>ab</sup> ±0.14	4.15 <sup>ab</sup> ±0.11	3.97 <sup>ab</sup> ±0.10
20-24 Weeks	5.02 <sup>ab</sup> ±0.06	4.80 <sup>b</sup> ±0.23	5.45 <sup>a</sup> ±0.18	4.85 <sup>c</sup> ±0.03	4.94 <sup>ab</sup> ±0.16	4.94 <sup>ab</sup> ±0.29
12-24 Weeks	4.18 <sup>a</sup> ±0.10	4.14 <sup>ab</sup> ±0.05	4.16 <sup>a</sup> ±0.02	4.00 <sup>ab</sup> ±0.05	4.02 <sup>ab</sup> ±0.08	3.93 <sup>b</sup> ±0.08
<b>Mortality (%)</b>						
12-24 Weeks	0/15	0/15	1/15	0/15	0/15	1/15

a,b,c: Means in the same row with different letters are significantly different (P<0.05).

**Digestibility Coefficients:**

The apparent nutrients digestibility of different experimental diets are recorded in Table (3). The data showed that the addition of 1.0% sweet basil in turkey diets significantly (p < 0.05) improved digestion coefficients of organic matter, crude protein, crude fiber and nitrogen free extract. Whereas, the control group recorded the highest value of ether extract, followed by the group fed diet supplemented with sweet basil. The group of turkey that received 1.0% peppermint showed the lowest digestibility coefficient for

crude protein. On the other hand, all nutrients digestibility of other groups fed 1.0% level improved with no significantly effect compared with the control group. These results are parallel to the performance findings including body weight, body weight gain and feed consumption.

The highest values of apparent nutrients digestibility for birds fed diet contained 1.0% sweet basil may be due to anti-microbial activity against a wide range of foodborne gram-positive and negative bacteria, yeasts and moulds as reported by Lachowicz *et al.*, (1998). The results of present study are in agreement with those obtained by Ibrahim *et al.*, (2000) who reported that the highest values of digestibility coefficient were obtained in rabbits received 0.5% sweet basil in the diet, while the lowest values were recorded for rabbit group fed 0.5% peppermint.

**Table (3): Digestion coefficients of nutrients of the experimental treatments.**

Digestibility Coefficients %	Control	1.0% peppermint	1.0% Oregano	1.0% Sweet basil	1.0% Thyme	1.0% Mix
Organic mater	78.46 <sup>b</sup> ±0.32	78.98 <sup>b</sup> ±0.41	79.42 <sup>b</sup> ±1.65	82.53 <sup>a</sup> ±0.20	80.60 <sup>ab</sup> ±0.50	79.51 <sup>b</sup> ±0.69
Crude protein	84.96 <sup>b</sup> ±1.13	84.51 <sup>b</sup> ±0.80	85.14 <sup>b</sup> ±0.66	87.66 <sup>a</sup> ±0.34	86.33 <sup>ab</sup> ±0.50	84.78 <sup>b</sup> ±0.38
Ether extract	76.82 <sup>a</sup> ±0.473	69.22 <sup>bc</sup> ±3.60	65.87 <sup>c</sup> ±3.35	72.50 <sup>ab</sup> ±0.45	68.23 <sup>bc</sup> ±0.63	73.92 <sup>a</sup> ±0.94
Crude fibre	26.26 ±0.80	38.35 ±6.00	36.56 ±11.61	42.79 ±4.01	40.76 ±2.58	30.72 ±1.87
Nitrogen free extract	79.84 <sup>b</sup> ±0.79	80.50 <sup>b</sup> ±0.45	81.43 <sup>b</sup> ±1.54	84.13 <sup>a</sup> ±0.10	82.22 <sup>a</sup> ±0.45	81.69 <sup>ab</sup> ±0.95

a,b,c : Means in the same row with different letters are significantly different (P<0.05)

**Carcass Characteristics:**

The results of carcass characteristics are given in Table (4). The values ranged between 67.58-69.26 , 3.98-4.21 , 1.87-1.97, 1.74-1.91 , 0.3-0.35 , 75.80-77.73 , 3.52-4.02 , 5.73-7.17 and 22.27-24.20 (as percentage of live body weight ) for dressing, giblets, gizzard, liver, heart, total edible parts, blood, feather and total inedible parts. The results were significantly affected (P<0.05) particularly those of heart , total edible parts, feather and total inedible parts( as percentage of live body weight ). However, the turkey group fed diet contained 1.0% sweet basil recorded the lowest value of heart % as compared to the control group. While, the lowest value of total edible parts % was recorded by oregano group. The control group recorded the lowest values for feather % and total inedible parts, also it showed the highest values for heart % and total edible parts which were 0.35 and 77.73 %, respectively.

These results are similar to what was reported by Zeinab *et al.*, (2003) who found that no significant effect was detected on body weight, carcass, liver and gizzard by using medical herbal i.e. red pepper or marjoram in broilers diet , whereas the value of heart % decreased for birds receiving marjoram .

**Table (4): Effect of experimental treatments on carcass traits.**

Item	Control	1.0% peppermi nt	1.0% Oregano	1.0% Sweet basil	1.0% Thyme	1.0% Mix
Live body weight (gm)	6453.33 ±47.11	6360.00 ±43.59	6460.00 ±65.58	6460.00 ±43.72	6486.67 ±46.06	6306.67 ±46.83
Dressing %	69.21 ±0.26	69.26 ±0.07	67.58 ±0.09	67.64 ±0.62	68.32 ±0.80	69.02 ±0.42
Giblets %	4.12 ±0.02	4.19 ±0.07	4.19 ±0.10	3.98 ±0.08	4.12 ±0.03	4.21 ±0.16
Gizzard %	1.92 ±0.03	1.97 ±0.03	1.97 ±0.03	1.94 ±0.05	1.87 ±0.05	1.95 ±0.08
Liver %	1.85 ±0.02	1.88 ±0.04	1.90 ±0.07	1.74 ±0.03	1.91 ±0.02	1.91 ±0.08
Heart %	0.35 <sup>a</sup> ±0.01	0.34 <sup>ab</sup> ±0.01	0.32 <sup>bc</sup> ±0.01	0.30 <sup>c</sup> ±0.01	0.34 <sup>ab</sup> ±0.01	0.35 <sup>a</sup> ±0.00
Total edible parts %	77.73 <sup>a</sup> ±0.34	77.67 <sup>a</sup> ±0.30	75.80 <sup>b</sup> ±0.22	76.31 <sup>a</sup> ±0.71	76.75 <sup>a</sup> ±0.72	77.43 <sup>a</sup> ±0.74
Blood %	3.87 ±0.05	3.52 ±0.34	3.52 ±0.07	3.61 ±0.09	3.96 ±0.09	4.02 ±0.07
Feather %	5.73 <sup>b</sup> ±0.23	5.96 <sup>b</sup> ±0.34	7.04 <sup>a</sup> ±0.09	7.17 <sup>a</sup> ±0.16	6.73 <sup>a</sup> ±0.18	6.82 <sup>a</sup> ±0.08
Inedible parts %	22.27 <sup>b</sup> ±0.34	22.33 <sup>b</sup> ±0.29	24.20 <sup>a</sup> ±0.22	23.69 <sup>b</sup> ±0.71	23.25 <sup>b</sup> ±0.72	22.57 <sup>b</sup> ±0.74

a,b,c: Means in the same row with different letters are significantly different (P?0.05).

#### **Blood Plasma Constituents:**

The data obtained for the values of blood plasma constituents are showed in Table (5). The data showed that, adding medical plants as feed additives in turkey diets improved plasma total protein, albumin, globulin and A/G , with exception, in group fed the combination of all plants (T6) which recorded the lowest value of plasma globulin. This improvement was significant only for albumin values. These results contribute with the improving of performance and digestibility coefficients and are in harmony with those obtained by Abdel Malak, *et al*, (1995), Ibrahim, *et al*, (1998), and Tollba (2003) in broilers and Abdel-Latif, *et al*, (2002) in japanese quail.

Plasma cholesterol and total lipids were decreased with no significant effect by adding the medical plants in turkey diets comparing with control group . Similar observations were obtained by Abaza (2001) and Tollba (2003) in broilers and Ghazalah and Ibrahim (1996) who reported that ducks having thyme oil had lower values of blood total lipids and total cholesterol content than control group.

With exception of turkey group fed 1.0 % dried thyme, the values of GOT significantly decreased (  $p \geq 0.05$  ) with adding medical plants in diet compared with the control group, also, the values of plasma GPT decreased but not significantly with this addition .

**Table (5): Some blood constituents of turkey poultts fed on experimental diets.**

Items	Control	1.0% peppermint	1.0% Oregano	1.0% Sweet basil	1.0% Thyme	1.0% Mix
Total protein (g/dl)	4.56 ±0.15	4.80 ±0.02	5.20 ±0.15	5.12 ±0.19	5.17 ±0.28	4.82 ±0.27
Albumin (g/dl)	2.56 <sup>b</sup> ±0.08	2.71 <sup>a,b</sup> ±0.03	2.97 <sup>a</sup> ±0.13	2.93 <sup>a</sup> ±0.14	2.97 <sup>a</sup> ±0.16	2.87 <sup>a,b</sup> ±0.09
Globulin (g/dl)	2.00 ±0.09	2.09 ±0.05	2.27 ±0.07	2.19 ±0.15	2.19 ±0.18	1.95 ±0.17
A/G ratio	1.22 ±0.05	1.30 ±0.04	1.34 ±0.06	1.35 ±0.11	1.37 ±0.09	1.48 ±0.08
Total lipids (mg/dl)	327 ±21.93	310 ±22.26	289 ±17.65	289 ±16.18	294 ±17.37	297 ±15.31
Cholesterol (mg/dl)	117 ±4.91	107 ±6.57	99 ±2.84	100 ±3.61	100 ±10.67	109 ±4.10
GOT (U/L)	85 <sup>a,b</sup> ±5.40	84 <sup>a,b</sup> ±5.24	67 <sup>c</sup> ±5.29	71 <sup>bc</sup> ±5.03	89 <sup>a</sup> ±4.67	85 <sup>a,b</sup> ±4.93
GPT (U/L)	28 ±1.86	26 ±4.06	21 ±2.40	22 ±1.53	21 ±1.73	23 ±2.60

a,b,c : Means in the same row with different letters are significantly different (P<0.05)

These results are comparable to those reported by Abdel-Malak *et al.*, (1995) when added biotonic as herbal feed additive and Affi (2001) when added 2 or 3 % *Negella sativa* seeds, they reported that GPT and GOT activities were decreased ( P > 0.05 ).

**Economical Efficiency:**

The economical efficiency of dietary treatments are recorded in Table (6). The prices of dietary medicinal feed additives were higher than control diet because these additives were added over 100% of the control diet.

**Table (6): The economical efficiency of the experimental diets**

Items	Control	1.0% peppermint	1.0% Oregano	1.0% Sweet basil	1.0% Thyme	1.0% Mix
Cost of 1kg of medicinal additives	0.00	8.00	8.00	16.00	20.00	13.00
Cost of basal diet (L.E/kg)	0.800	0.800	0.800	0.800	0.800	0.800
Total prices (L.E/kg)	0.800	0.808	0.808	0.816	0.820	0.813
Feed/1kg gain (kg)	4.18	4.14	4.16	4.00	4.02	3.93
Feed cost of 1kg gain (L.E)	3.344	3.345	3.361	3.264	3.296	3.195
Relative to control (%)	100	100	101	97.6	98.6	95.5

The data showed that addition of 1.0% of the combination of all medical plants to turkey diets scored the least total feed cost/kg gain, followed by those received 1.0% either sweet basil or thyme, respectively. The highest total feed cost/kg gain, was recorded with oregano diet.

Generally, it could be concluded that, using dietary sweet basil, oregano, peppermint, thyme and their mixture as natural growth promoters improved growth performance, digestibility and blood parameters of turkey poultts during 12-24 weeks of age.



## REFERENCES

- Abaza, I. M. K. (2001). The use of some medicinal plants as feed additives in broiler diets. Ph.D. thesis, Faculty of Agriculture, Alexandria Univ., Egypt.
- Abdel-Latif, S. A.; A. A. Faten; and A. M. El-Kaiaty (2002). Effect of feeding dietary thyme, black cumin, dianthus and fennel on productive and some metabolic responses of growing Japanese quail. *Egypt Poultry Sci.*, 22(1): 106-125.
- Abdel-Malak, N.Y.; M. S. Abdel-Malak; G. M. El-Gendi and F. Emily, Naguib (1995). Effect of feeding different levels of herbal feed additives on broiler performance in relation to some metabolic functions. *Egypt Poultry Sci.*, 15: 111-139.
- Afifi, O. S. (2001). Effect of different levels of freshly crushed nigella sativa seeds on performance, organ weights and blood constituents of broiler chickens reared under hot climatic condition. *Egypt Poultry Sci.*, 21(II): 567-583.
- A.O.A.C. (1990). Association of Official Analytical Chemists. Official Methods of Analysis. 15<sup>th</sup> Ed., Published by the A.O.A.C. Washington, D.C. USA.
- Aruome, O. I.; J. P. E. Spencer; R. Rossi; R. Aeschback; A. Khan; N. Mahmood; A. Munoz; A. Murcia; J. Butler and B. Halliwell (1996). An evaluation of the antioxidant and antiviral action of extracts of rosemary and provincial herbs. *Food Chemistry and Toxicology*, 34(5): 449-456.
- Botsoglou, N. A.; A. L. Yannakopoulos; D. J. Fletovris and G. A. S. Tserveni (1997). Effect of dietary thyme on the oxidative stability of egg yolk. *Journal of Agriculture Food Chemistry*, 45 (10): 3711-3716.
- Boulos, I. (1983). Medicinal plants of north Africa reference publication. Inc. Proc., 2<sup>nd</sup> con. Fac. Vit. Med. Cairo, Egypt, (1992).
- Deans, S. G. and K. P. Svoboda (1990). The antimicrobial properties of marjoram, *Origanum majorana* L. volatile oil Flavor and Fragrance Journal, 5 (3): 187-190.
- El-Badri, A.A. and Abu El-Maged (1992). Occurrence of duck trichomoniasis at Qena Governorate Egypt. *Assiut Veterinary-Med. J.*, 27: 257-260.
- El-Gendi, G. M.; M. M. El-Wardany; and M. M. Iraqi (1999). Physiological responses of the inclusion of egg-plus in diets of laying hens and its effect on productive performance. *Egyptian J. Nutrition and Feed*, 2 (Special Issue): 633-648.
- Ghazalah, A. A. and Faten, A. Ibrahim (1996). The possibility of using some edible and aromatic oils in the nutrition of Muscovi ducks. *Egypt Poultry Sci.*, 16(II): 305-328.
- Hattaba, N. A.; S. A. Ibrahim; A. I. Faham and M. A. El-Shiekh (1994). Utilization of enzyme preparation kemzyme in layer rations. Proc. of 2<sup>nd</sup> Scientific Conference on Poultry 12-13 Sep. (1994) Kafr El-Shiekh (1994).

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- Ibrahim, M. R.; M. S. Abd El-latif and A. T. El-Yamany (1998). Effect of adding some natural growth promoters to broiler chicks diets on growth performance, digestibility, and some metabolic functions. J. Agric. Sci. Mansoura Univ., 23(3): 1029-1037.
- Ibrahim, SH. A. M.; A. A. El-Ghamry and G. M. El-Mallah (2000). Effect of some medicinal plants of Labiatae family as feed additives on growth and metabolic changes of rabbits . Egyptian Journal of Rabbits Science, 10(1): 105-120
- Jakobsen, P.E.; S. K. Gertoveg and H. Nielsore (1960). Digestibility trial with poultry. 322. beetning frd, frosgs laboriet, Udgivet of statens. Hus dyrbugsudvolg. Kobenhavn. (Cited by Abdel Hamid 1974).
- Kolacz, R. ; E. Bodak; M. Switala and P. Gajewezk (1977). Herb as agents affecting the immunological status and growth of piglets weaned with body weight deficiency. Journal of Animal Feed Science, 6 (2): 269-279.
- Kusamran, W. R.; A. Ratanavila and A. Tepsuwan (1998). Effect of neem flower, thai and chinese bitter gourd fruits and sweet basil leaves on hepatic monooxygenase and glutathion s-transferase activities, and *in vitro* metabolic activation of chemical carcinogens in rats. Food Chemistry and toxicology, 36 (6): 475-484.
- Lachowicz, K. J.; G. P. Jones; D. R. Briggs; F. E., Bievenu; J. Wan; A. Wilcock and M. J., Coventry (1998). The synergistic Preservative effects of the essential oils of sweet basil, *Ocimum basilicum* l. against acid-tolerant food microflora. Letters in Applied Microbiology, 26 (3): 209-214.
- Makled, M. N. (1993). Enzymes as poultry feed supplement. Proc. of 4<sup>th</sup> Sci. Symp. For Animal, Poultry and Fish Nutrition. El-Fayoum, Egypt.
- NRC, (1994). National Research Council. Nutrient requirements of Poultry. 9<sup>th</sup> Ed. National Academy Press, Washington, DC.
- Radwan, M. A.; G. A. Abd Allah; H. M. Fayek and M. A. Brieweah (1995). The effect of three types of feed additives on the productive performance of layers. 1<sup>st</sup> Egyptian Hungarian Conf. 17-19 September Alexandria, Egypt.
- Rinzler, C. A. (1990). The Complete Book of Herbs, Spices and Condiments. Facts on File, New York. Oxford.
- SAS. (1998). SAS, Procedure Guide. Version b.12 Ed. "SAS Institute Inc., Cary, NC, USA.
- Tollba, A. A. H. (2003). Using some natural additives to improve physiological and productive performance of broilers chicks under high temperature conditions. 1- Thyme (*Thymus Vulgaris* L.) or fennel (*Foeniculum Vulgare* L.). Egypt Poult. Sci., 23(II): 313-326.
- Younis, T. M. (1987). Effect of Feed additives on broiler performance . Ph.D. Thesis, El-Azhar Univ. Faculty of Agriculture, Cairo.
- Zeinab, M. A. Abdo.; A. Z. M. Soliman and Olfat S. Barakat (2003). Effect of hot pepper and marjoram as feed additives on the growth performance and the microbial population of the gastrointestinal tract of broilers. Egypt Poult. Sci., 23(I): 91-113.

استجابة دجاج الرومي النامي لبعض النباتات الطبية كمنشطات نمو طبيعية  
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أجريت هذه التجربة بهدف تقييم تأثير إضافة بعض النباتات الطبية مثل النعناع الفلفلي والبردقوش والريحان الحلو والزعرير بنسب متساوية في علائق دجاج الرومي علي بعض الصفات الانتاجية والتمثيلية . استخدم في هذه الدراسة ٩٠ ديك رومي عمر ١٢ أسبوعاً وتم تقسيمها الي ٦ مجاميع بكل مجموعة ١٥ طائراً قسمت الي ٣ مكررات ( ٥ طيور لكل مكرر ) وأسئمرت التجربة حتي عمر ٢٤ أسبوعاً وكانت المعاملات التجريبية كالآتي :

- \* المعاملة الاولى (المقارنه) : غذيت علي العليقة الاساسية بدون اضافات .
- \* المعاملة الثانية : غذيت علي العليقة الاساسية + ١% أوراق النعناع الفلفلي الجافة.
- \* المعاملة الثالثة : غذيت علي العليقة الاساسية + ١% أوراق البردقوش الجافة.
- \* المعاملة الرابعة : غذيت علي العليقة الاساسية + ١% أوراق الريحان الحلو الجافة.
- \* المعاملة الخامسة : غذيت علي العليقة الاساسية + ١% أوراق الزعرير الجافة.
- \* المعاملة السادسة : غذيت علي العليقة الاساسية + ١% من مخلوط أوراق كل منهم بنسب متساوية.

وتم تسجيل قياسات الاداء الانتاجي كل أربعة أسابيع وتم في نهاية التجربة اجراء تجربة هضم وتجربة ذبح علي عدد ثلاث طيور وكذلك تم أخذ عينات الدم لتقدير كسل من البروتين الكلي والاليومين والجلوبيولين كذلك تم تقدير الدهون الكلية والكوليستيرول وأنزيمات الكبد.

أوضحت النتائج أن إضافة النباتات الطبية بصفة عامه أدى إلي تحسن معدلات النمو والغذاء المستهلك وكذلك معامل التحويل الغذائي وكانت أفضل النتائج المتحصل عليها للمجموعة المغذاه علي العليقة المحتوية علي ١% أوراق الريحان الحلو واتفقت هذه النتائج مع معاملات الهضم حيث سجلت المجموعة المغذاه علي الريحان الحلو أفضل المعاملات لهضم المادة العضوية ، البروتين الخام ، والألياف الخام وكذلك المستخلص الخالي من الأزوت.

أوضحت نتائج تجارب الذبح عدم وجود فروق معنوية في نسبة التصافي وأوزان الأعضاء المأكولة فيما عدا وزن القلب الذي سجلت فيه مجموعة المقارنه أعلى وزن . أدت التغذية علي العلائق المحتوية علي النباتات الطبية الي زيادة تركيز كل من البروتين الكلي والاليومين والجلوبيولين مع حدوث انخفاض في مستوى كسل من الدهون الكلية والكوليستيرول وأنزيمات الكبد ( GPT - GOT ) في بلازما الدم .

اتضح من الدراسة تحسن الكفاءة الاقتصادية لاضافة كل من أوراق الزعرير ومخلوط النباتات الطبية المستخدمة الي علائق الدجاج الرومي في الفتره من ١٢-٢٤ اسبوع من العمر . مما سبق نستنتج ان إضافة النباتات الطبية مثل النعناع الفلفلي ، البردقوش ، الريحان الحلو و الزعرير بنسبة ١% من علائق الرومي النامي قد أدى الي تحسن الكفاءة الانتاجية والاقتصادية وبعض قياسات الدم.