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EFFECTS OF SOME HERBAL ADDITIVES ON PHYSIOLOGICAL AND PRODUCTIVE PERFORMANCE OF A LOCAL STRAIN of chicken under HOT CLIMATIC CONDITIONS

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ABSTRACT

A total of 108 pullets and 12 cocks of Bandrah strain at sexual maturity (24 wks old) were randomly chosen. Birds were divided allocated into three equal groups. The 1st group was fed a basal diet and used as a control while, the 2nd and 3 th groups were fed basal diet supplemented with 2% black seeds or fresh garlic (as herbal additives), respectively. Treatments were conducted during summer season under38°C at daylight and 30°C night from 24 to 36 weeks of age.

Results indicated that there were no significant differences in body weight gain due to supplementing studied herbal additives. Feed consumption was ($P<0.05$) increased and feed conversion was ($P<0.05$) improved by adding herbal additives. Supplementing the basal diet with garlic significantly increased egg production rate and egg mass while, black seeds supplementation was insignificantly increased the same parameters compared with control group. Besides, total protein as well as albumin and globulin, and T_3 were increased significantly while, creatinine, GPT and GOT were not affected. Also, plasma glucose was decreased significantly by feeding diet supplemented with herbal additives. Moreover, herbal additives decreased significantly plasma, liver and egg total cholesterol and total lipids. The, relative weight of thymus and thyroid glands were increased significantly due to herbal additives. Furthermore, fertility, hatchability, hatched chick weight percentages and egg quality improved numerically comparing with un-supplemented control group. This study suggested that herbal additives could be used in laying hens diets to improve the productive performance, blood biochemical, egg quality and immune glands weight of laying hens without any harmful side effects on the human health.

INTRODUCTION

Recently, there is a tendency to use of herbs, seeds, and edible plants as natural feed additives to avoid the residual cumulative effects of antibiotics or any other synthetic drugs in final product of poultry, which has a positive effect on the human health. Herbs have some medical properties and pharmacological activity that could help in improving productive, physiological, immunological performance or plasma biochemical parameters of poultry. The efficiency of herbal edible plants and some plant seeds as non-traditional feed additives, growth promotion (Abaza, 2001), natural tonic, restoratives, antibacterial and antiparasitic drugs (Khodary *et al.*, 1996) on improving the productive performance in poultry have been proven. Adding black seeds to poultry diets resulted in improving body weight (El-Kaiaty *et al.*, 2002) in laying hens, Zeweil, (1996) in growing and laying Japanese quails, Tollba and Hassan (2003) in broilers chicks, and better feed conversion (Abdo, 1998). Nigella sativa seeds had potent effect towards protection from decrease in hemoglobin and leukocyte counts and its inhibitor

against aflatoxin formation (Nair, *et al*.., 1991). Also, black seeds reduced the concentration of serum cholesterol and triglycerides (Mandour *et al*..1995), serum total lipids and liver cholesterol in broiler (Abdo, 1998), fat content, serum total lipids and serum cholesterol in ducks (Ghazalah and Ibrahim, 1996). Garlic could be used as growth promoter in broilers (Day and Samanto, 1993), as hypo-cholesterolemic and hypo-liplemic in White Leghorn (Sharma, 1979). Also, Adding garlic to poultry diets, resulted in improving body weight (Day and Samanto, 1993), better feed conversion (Abdo, 1998), increased egg production of IZA Brown and Fayoumi hens (Mohamed *et al*., 2000). This work was performed to study the effects of some natural herbal additives (Black seeds and Garlic) on productive, physiological, immunological performance and improving egg quality of local strain, during hot summer season subsequently in hot environmental temperature.

MATERIALS AND METHODS

This study was done at the Seds Poultry Breeding Research Station, Animal Production Institute, Agricultural Research Center, Ministry of Agriculture, Beni-Suef Governorate, Egypt from June to August (summer). A total of 90 pullets and 9 cocks of Bandrah strain at (30 wks old) were randomly chosen. The birds were allocated into three equal groups had nearly similar body weight, each containing (30) birds in three replicates (9 pullets and a cock each) in open system floor pens. The 1st group were fed a basal diet (Table 1) and served as control group, while the 2nd and 3 ^{ed} groups were fed on the same diet supplemented with 2% black seeds (Nigella sativa) or fresh garlic cloves (Allium Sativum), respectively. Treatments were conducted during summer season with average temperature ranged between 38°C and 30°C from 24 to 36 weeks of age. The birds were kept under the same condition of management throughout the experimental period. Body weight, feed intake, feed conversion ratio, egg number and egg weight were recorded for each group. A total number of 60 eggs (laid on consecutive days) were taken from the experimental groups for egg quality measurements (shell weight %, yolk weight %, albumen weight %, yolk index and haugh unit according to Stadleman (1977) were determined. In August, 5 birds / group/ strain were taken and located individually then five eggs were collected to determine egg total lipids and total cholesterol. The same birds were slaughtered, lymphoid organs weighed and calculated as mg/100g body weight. Blood sample centrifuged, plasma separated and stored at – 20 °C until analyzed. Plasma total protein (g/dl) albumin (g/dl), glucose (mg/dl), T_3 (ng/dl), cholesterol (mg/dl), total lipids (mg/dl), creatinine (mg/dl), glutamic pyruvic transaminase (GPT) (U/L), glutamic oxaloacetic transaminase (GOT) (U/L), yolk and liver total cholesterol (mg/g) and total lipids (mg/g) were colorimeterically determined. The manufacture recommendations of commercial kits were used for all determinations. At the end of each season, the collected eggs from each treatment were set in an electric forced draft incubator then fertility and hatchability percents were calculated and the hatching chicks were

individually weighed. Data were subjected to statistical analysis using computerized analysis of variance and Duncan's multiple range test procedures (SAS, 1998). The percentage values were transferred to percentage angle using arcsine equation before subjected to statistical analysis.

Table (1): Composition and calculated analysis of the basal diet fed to experimental birds.

Ingredients	%
Corn Yellow	66.00
Soybean meal 44 %	23.00
Wheat bran	2.50
Di-calcium phosphate	1.50
Limestone meal	6.20
Salt (NaCl)	0.40
Dl-Methionine	0.10
Vit. & Min. Mixture *	0.30
Total	**100.00**
Calculated analysis	
Metabolizable energy (Kcal / Kg)	2747
Crude protein %	15.67

* **Supplied per Kg of diet: Vit. A, 10 000 000 IU; Vit. D_3, 2 000 000 IU; Vit. E,10 mg; Vit. K_3,1 mg; Vit. B_1, 1mg; Vit. B_2, 5 mg; Vit. B_6, 1.5 mg; Vit. B_{12}, 10 mg; Niacin, 30mg; Pantothens ic acid, 10mg; Folic acid,1mg; Biotin, 50mcg;Choline chloride,260mg; Copper, 4 mg; Iron, 30mg; Manganese, 60mg; Zinc,50mg; Iodine,1.3mg; Selenium, 0,1mg; Cobalt, 0.1mg;**

RESULTS AND DISCUSSION

I - Productive performance:

1- Body weight gain

It is evident from Table (2) that, body weight gain was approximatly similar for all groups fed herbal additives or control. Abdo, (1998) with broilers, Ghazalah and Ibrahim (1996) with ducks, Taha (1997) with rabbits and El-Kaiaty *et al.*, (2002) with White Bovans laying hens, obtained the same results when added black seeds to the diets. Also, with garlic, El-Habbak *et al.*, (1989) in quails, Qureshi *et al.*. (1983a) in Leghorn pullets and Konjufca *et al.*., (1995) with broiler, observed similar body weight results.

2- Feed consumption and conversion:

Table (2) clearly shows that, birds consumed ($P<0.05$) more feed due to the use of garlic or black seeds than un-supplemented control group. These results confirm previous finding of El-Nawawy (1991) and Sharma *et al.*, (1979) reported that feeding garlic powder to adult White Leghorn hens at the rate of 3 % significantly increased fed consumption by 13 g /bird/day. Also, Mohamed *et al.*, (2000) attributed the ISA brown and Fayoumi hens consuming significantly more feed due to the use of garlic palatability of feed and for the strong smelling odour of garlic. On the other hand, feed consumption did not affect by dietary garlic of Leghorn pullets (Qureshi *et al.*.

(1983a) or by dietary black seeds of White Bovans pullets (El-Kaiaty *et al.*, 2002).

Data in the same Table pointed out that, birds fed studied herbal additives had a significant (P<0.05) improvement in feed conversion compared with un-supplemented control birds. In general, significant (P<0.05) improvement in feed conversion was obtained by feeding garlic compared to other treatments applied. These results confirm previous finding of El-Nawawy, (1991), Prasad and Pandey, (1995) and El-Ghamry *et al.*, (2002) when added 0.4% Nigella sativa or 2 %garlic to broiler diet and found significant effect on feed conversion. Further studies reported by El-Kaiaty *et al.*, (2002) when added black seeds or garlic to laying hens

3- Egg Production Traits:

It was observed that, birds fed diet supplemented with garlic laid significantly (P<0.05) more and heavy eggs compared with un-supplemented control birds Table (2). In general, insignificant increases were noticed in egg production (mass, weight and production rate) of birds fed dietary black seeds. These Previous finding of Sharma *et al.*, (1979) reported that feeding 1% garlic powder to White Leghorn layer caused significant (P<0.05) increase in percent hen housed egg production. Furthermore, Mohamed *et al.*, (2000) reported that ISA Brown and Fayoumi hens fed garlic laid significantly more eggs compared with control groups while Fayoumi hens responded better than ISA Brown hens which confirm our results. Concerning to egg weight, El-Habbak *et al.*, (1989) reported that adding 4 % garlic to quail diet caused a significant (P<0.05) increase egg weight. On the contrary, El-Kaiaty *et al.*, (2002) observed no marked change in both egg number or egg production rate when black seeds or garlic were added to the diets of layer White Bovans hens. However, El-Habbak *et al.*, (1989) found a depression in egg production of Japanese quail when fed 0.5 or 1(g) garlic g/bird/day. This contradiction may be due to the difference in species or dose of garlic. The present results of feed consumption and conversion approved and explained the increasing of egg production.

Table (2): Productive performance of laying hens fed tested herbal additives from 24 to 36 weeks of age (M±S.E.).

Items	Control	Black seed	Garlic
Body weight gain (g)	208.1±20.7^{a}	216.4±19.2^{a}	218.0±13.8^{a}
Feed consumption Hens /day	87.06±0.38^{b}	91.70±0.36^{a}	92.76±0.62^{a}
Feed conversion Hens /egg/ wks	5.29±0.02^{a}	4.97±0.03^{b}	4.32±0.02^{c}
Egg production rate/Wks	2.35±0.10^{b}	2.56±0.07^{b}	2.91±0.14^{a}
Egg mass hens /wks	115.39±3.48^{b}	129.10±3.75^{b}	150.30±7.62^{a}
Egg weight (g)	49.10±0.53^{b}	50.43±0.63^{ab}	51.65±0.81^{a}

Means within a row having different superscript are significantly different (P<0.05)

II -Blood biochemical parameters:

1 - Some blood parameters:

Data in Table (3) include, T_3 had significantly (P<0.05) increased due to feeding diet supplemented with herbal additives compared with control

Data in Table (3) include, T_3 had significantly ($P<0.05$) increased due to feeding diet supplemented with herbal additives compared with control group. Similarly, Khodary *et al.*, (1996) reported that small doses of black seeds may stimulate the thyroid gland directly and/or through the pituitary gland and doses may inhibit the iodination of T_3 to T_4. Feeding 1% Nigella sativa seeds increased the concentration of thyroxin (Mandour *et al.*, 1998). Also, El-Nawawy, (1991) reported that garlic stimulated growth due to of its like thyroid activity. Further studies reported by Abd El-Latif *et al.*, (2002) with Japanese quail found the same results when added black cumin to the diets.

Also, Total protein as well as Albumin and Globulin were significantly ($P<0.05$) affected by dietary treatment (Table3). Increasing globulin may be due to the immunostimulate as affected by feeding studied herbal additives. Likewise, Afifi, (2001) observed the same results when added 2 or 3% Nigella sativa in hot climatic condition, Abdo, (1998) and Tollba and Hassan (2003) when fed garlic or black cumin and Abd El-Latif *et al.*, (2002) when added black cumin to Japanese quail diet.

Manifest from Table (3) those, dietary herbal additives in either strains or seasons did not affect Creatinine GPT and GOT values significantly. Similarly, El-Habbak *et al.*, (1989) when claimed that no significant differences in SGOT or SGOT activities by feeding garlic or its extracts to Japanese quail. Furthermore, the same observations were noticed by Tollba and Hassan (2003) when fed garlic or black cumin to broiler diets and Abd El-Latif *et al.*, (2002) when added black cumin to Japanese quail diets and found that no significant change in creatinine GPT and GOT values.

Table (3): plasma biochemical parameters of laying hens fed supplemented herbal additives (Mean ±S.E.).

Items	Control	Black seed	Garlic
T_3 (ng/dl)	262.56 ± 1.16^{c}	298.54 ± 4.38^{a}	306.85 ± 3.48^{a}
Total protein (mg/dl)	3.42 ± 0.31^{b}	4.21 ± 0.45^{a}	4.58 ± 0.34^{a}
Albumin (g/dl)	2.39 ± 0.71^{b}	2.70 ± 0.17^{a}	2.79 ± 0.63^{a}
Globulin (g/dl)	1.03 ± 0.06^{c}	1.51 ± 0.25^{b}	1.79 ± 0.52^{a}
Creatinine (mg/dl)	0.76 ± 0.01^{a}	0.73 ± 0.02^{a}	0.74 ± 0.01^{a}
GPT (U/L)	58.64 ± 0.60^{a}	57.98 ± 1.67^{a}	58.14 ± 0.49^{a}
GOT (U/L)	20.54 ± 1.13^{a}	20.16 ± 1.06^{a}	20.82 ± 0.51^{a}
Glucose (mg/dl)	255.37 ± 5.60^{a}	173.28 ± 3.73^{c}	167.36 ± 5.60^{c}

Means within a row having different superscript are significantly different (P<0.05)

As Table (3) show Glucose content was depressed significantly ($P<0.05$) by feeding herbal additives compared with un-fed control birds. Similarly, El-Kaiaty *et al.*, (2002) found a reduction (16 or 11%) in serum glucose by adding 2% black seeds or garlic. Farva *et al.*, (1986) gave garlic oil to streptozotocin-diabetic rats for two months decreased the raised blood sugar. A possible reason of this effect may be due to hexokinase present in garlic which was found to phosphorylate D-glucose, D-mannose, D-fructose, and D-glucosemine with preferential action on glucose (Bhat and Abiraman, 1979). Qureshi *et al.*, (1983a) observed reduction of 33-39% in glucose-6-

phosphate dehydrogenase by adding garlic paste, solvent fractions or garlic oil to white Leghorn diets.

2- Plasma Total cholesterol and Total lipids:

Inspection of data in Table (4) shows that, a significant decrease ($P<0.01$) in total cholesterol and total lipids was detected due to the feeding of studied herbal additives compared with un-supplemented control diet. The reduction was more profound in birds fed garlic. Generally, These findings are in agreement with Sharma *et al.*, (1979) and Qureshi *et al.*, (1983b) with White Leghorn layer hens, Mohamed *et al.*, (2000) with domestic fowl, El-Habbak *et al.*, (1989) with Japanese quail, Ghasalah and Ibrahim (1996) with ducks, Konjufca *et al.*, (1997) with broiler when fed garlic. Also, Sklan *et al.*, (1992) when reported that serum cholesterol or serum total lipids were reduced significantly by feeding garlic due to its content of sulfur compounds which responsible for inhibiting biosynthesis of cholesterol and lipids. Similar resulted were obtained with feeding black seeds by Khodary *et al.*, (1996); El-Kaiaty *et al.*, (2002) and Mandour *et al.*, (1998).

Table (4): Blood, eggs and liver cholesterol and lipids of laying hens fed studied herbal additives (mean ± S.E.).

Items	Control	Black seed	Garlic
Plasma cholesterol (mg/dl)	178.14±5.69^a	141.34±10.1^b	122.15±11.6^c
Egg cholesterol (mg/g)	16.71±0.39^a	14.01±0.26^b	13.08±0.57^c
Liver cholesterol (mg/g)	176.34±5.97^a	123.83±0.73^c	104.40±5.54^d
Plasma total lipids (mg/dl)	1432.76±11.6^a	1358.96±17.4^b	1342.48±24.3^b
Egg Total lipids (mg/g)	322.19±23.1^a	276.24±10.8^b	264.61±4.87^c
Liver Total lipids (mg/g)	323.47±11.5^a	231.53±6.04^c	207.06±9.47^d

Means within a row having different superscript are significantly different ($P<0.05$).

3- Egg yolk Total cholesterol and Total lipids:

Table (5) signify that egg yolk total cholesterol and total lipids were significantly ($P<0.01$) decreased due to feeding diet included herbal additives, as well as their trend on plasma, comparing with un-supplemented control group. The declination was significantly ($P<0.05$) greater in group fed garlic. These results are in confirm with those reported by Sharma *et al.*, (1979), Mohamed *et al.*, (2000) and El-Kaiaty *et al.*, (2002) with laying hens, and El-Habbak *et al.*, (1989) with Japanese quail. They reported that yolk cholesterol or serum total lipids were reduced significantly by feeding garlic. Also, with black seeds, El-Kaiaty *et al.*, (2002) with laying hens found similar results.

4- Liver Total cholesterol and Total lipids:

Table (4) shows liver total cholesterol and total lipids of birds fed herbal additives were significantly ($P<0.01$) decreased, as well as their trend on egg yolk, compared with un-supplemented control birds. Total cholesterol and total lipids observations in liver followed the same pattern in plasma or in egg yolk. Similar results were obtained previously by Sharma *et al.*, (1976) with rabbit, Mohamed *et al.*, (2000) with laying hens, El-Habbak *et al.*, (1989) with Japanese quails, Konjufac *et al.*, (1997) with broilers and Ghazalah and Ibrahim (1996) with ducks when added garlic to diets. Also, with adding black

(1998) with broiler and Ghasalah and Ibrahim (1996) with ducks observed similar results.

Accordingly, Qureshi *et al.*, (1983b) observed a significant decrease in hepatic 3-hydroxy-3-methylglutaryl-CoA reductase, cholesterol 7∝-hydroxylase, fatty acid synthetase, and representative pentose-phosphate pathway activities accompanied with feeding of garlic or its extracts to both layer or broiler pullets. Since these enzymatic activities reflect the control of overall lipids metabolism significant decrease in serum lipids (serum total cholesterol, low-density lipoprotein cholesterol and triglycerides) occurred.They added that, garlic or its extracts contain cholesterol-supressive agents (alliin and allicin), and that the mechanism of their hypocholesterolemic action is at the level of the suppression of cholesterol biosynthesis. Also, Mandour *et al.*, (1998) suggested that feeding black seeds has non-toxic effect on liver and kidneys as confirmed by an improvement of enzymatic activities that decreased cholesterol and triglycerides. Moreover, Khodary *et al.*, (1996) and Edward (1976) attributed the decrease of cholesterol level by black seeds to its high unsaturated fatty acids contents which may be stimulate the cholesterol excretion into intestine where its oxidation to bile acids.

III – Relative weight of some lymphoid organs:

As shown in Table (5), a significant ($P<0.05$) increase were detected in relative weight of thymus and thyroid glands due to feeding diets included either garlic or black seeds compared with un-supplemented control diets. However, insignificant increases were noticed in spleen weight of birds fed dietary treatments. Herbal additives may due to the immunostimulate as affect increase weight of thymus, thyroid glands and globulin value. These results are similar to those reported previously by El-Kaiaty *et al.*, (2002) when fed garlic or black seeds and Abdo, (1998) who found that weight of thymus gland increased significantly by feeding 3% garlic but had no effect on spleen weight. Khodary *et al.*, (1996) reported that small doses of black seeds may stimulate the thyroid gland directly and/or through the pituitary gland.

Table (5): Relative weight of some lymphoid organs (mg/100g B.W.) of laying hens fed supplemented herbal additives (Mean ± S.E.).

Items	Control	Black seed	Garlic
Spleen	99.16±4.92[a]	100.79±10.8[a]	101.44±18.6[a]
Thymus	93.11±7.66[b]	107.86±16.8[a]	109.10±14.5[a]
Thyroid	3.41±0.16[b]	4.85±0.20[a]	4.97±0.16[a]

Means within a row having different superscript are significantly different (P<0.05).

Also, El-Nawawy, (1991) reported that garlic stimulate growth because of its like thyroid activity.

IV- Egg Quaity:

Table (6) data demonstrate that, egg quality (yolk index and haugh unit) or egg components (weights of shell, yolk and albumen) were not

affected by using of herbal additives. In this respect Alm Eldein (1999) who found no significantly change in yolk index, haugh unit or shell thickness of laying hens fed 5g garlic 3 or 6 days/week for two months. Also,Hassan (2000) found no significant in shell percentage when fed laying hens 2 % garlic or black seeds.

Table (6): Egg quality of laying hens fed studied herbal additives (M±S.E.)

Items	Control	Black seed	Garlic
Albumin weight %	54.77±0.76[a]	54.83±1.14[a]	54.32±0.45[a]
Shell weight %	11.44±1.89[a]	11.11±0.71[a]	11.93±0.27[a]
Yolk Weight %	33.79±1.21[a]	34.06±1.49[a]	33.75±0.72[a]
H. U.	88.49±1.65[a]	88.90±3.09[a]	87.85±1.79[a]
Yolk Index	39.19±0.69[a]	40.15±0.94[a]	39.86±0.61[a]

VI–Fertility and hatchability percentage:

Concerning fertility, hatchability and chick weight values, numerical improvements were detected due to feeding diets supplemented with tested herbal additives (Table 7). These results disagreed with reports showed that high levels of black seeds induced a decrease in egg fertility and hatchability percentages in laying hens (khodary *et al.*, 1996).

Results of this experiment suggested that, the addition of herbal additives (garlic or black seeds) to laying hens diets in order to improve productive, immunological and physiological performance during hot season. Also, it causes sharp decrease in total cholesterol and total lipids in plasma, liver and egg with no harmful side effect on the human health.

Table (7): Fertility and hatchability percentage of laying hens fed studied herbal additives (M±S.E.).

Items	Control	Black seed	Garlic
Fertility (%)	75.10±5.13[a]	76.66±2.27[a]	77.27±8.61[a]
Hatchability (%)	72.05±5.61[a]	74.88±2.40[a]	74.08±4.76[a]
Chick weight (g)	31.97±1.14[a]	32.39±0.39[a]	31.73±0.74[aa]
Chick weight (%)	66.80±0.78[a]	65.45±0.64[a]	66.02±1.18[a]

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., Alexandria, Egypt.

Abdel El-Latif, S. A.; Faten, A. A.; and El-Kaiaty, A. M. (2002). Effect of feeding dietary thyme, black cumin. Dianthusand, fennel on productive and some metabolic responses of growing Japanese quil. Egypt Poult. Sci., 22(1): 106-125.

Abdo, Z. M. A. (1998). The effect of using some natural growth promoter and fats on broiler performance and immunity. Ph. D. Thesis Faculty of Agriculture, Cairo, University, Giza, Egypt

Afifi, O. S. (2001). Effect of different level of freshly crushed nigella sativa seeds on performance, organ weights and blood cobstiuents of broiler chickens reared under hot climatic conditions. Egypt, Poult. Sci., 21(II): 567-583.

Alm El Dien, A. K.(1999). Physiological studies on cholesterol on laying hens. M.Sc. Thesis, Fac. of Agri. Cairo Unvi.Gisa, Egypt.

Bhat, P.G. and N.T. Abiraman (1979). Solubilization of a particulate hexokinase from garlic (Allium Sativum)bulbs. Indian J. Biochem. Biophys. 16 (5), 284-287.

Deighton, N.; Gidewell, S. M.; Dans, S. A.G.; and Goodman, B. A. (1993). Identification by ERR spectroscepy of corvacrol and thymol as the major sourcces of free-radicals in the oxidation of plant essential oil. J. Sci. Food Agric., 63: 221-225.

Day, A.; and Samanto, A. R. (1993). Effect of feeding garlic as growth promoter in broiler. Indian J. of Anim. Health 32 (1): 17-19.

Edward,C.N (1976). The cholestrol problem, the egg and laid metabolism in the laying hens. , poult. Sci., 55:14-30.

El-Ghamry, A. A.; El-Mallah, A. A.; and El-Yamny, A.T. (2002). The effect of incorporating yeast culture, Nigella sativa seeds and fresh garlic in broiler diets on their performance. Egypt, poult. Sci., 22(II): 445-459.

El-Habbak, M.M.E.; K. Saleh; M.S. Arbid; A.G. Hegazi and H. Sofy (1989). Influence of garlic (Allium Sativum) on some biological and biochemical chandes in Japanese quail with special reference to its hypocholesterolemic activity. Archiv fur Geflue Ikunde, 53 : 73-79

El-Kaiaty, A.M.; A. Z. M. Soliman; and M. S. H., Hassan (2002). The physiological and immunological effects of some natural feed additives in layer hen diets. Egyptian Poultry Sci., 22 (I): 175 – 203.

El-Nawawy, G. H. (1991). Some of non conventional ingredients in broiler ration. M. Sc. Thesis, Ainm.Prod. Dep.Fac.Agric.,Ain-ShamsUniv.

Farva, D., I.A. Goji, P.K. Joseph and K.T. Augusti (1986). Effect of garlic oil on streptozotocin –diabetic rats maintained on normal and high fat diets. Indian J. Biochem.Biophys. 23 (1), 14-27.

Ghazalah, A. A.; and Ibrahim, F. A. A. (1996). The possibility of using some edible and aromatic oils in the nutrition of muscovi ducks. Egyptian Poultry Sci., 16 (II): 305-328.

Hassan, S.H. (2000). Physiological studies on egg cholesterol and mmunity in layers.Ph.D.Thesis,Fac. of Agri. Cairo Unvi.Gisa,Egypt

Ibrahim, M. R.; Abd El-Latif, M. S.; and El-Yamany, A. T. (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., 32(3): 1029-1037

Khodary, R. M.; El-Ezzawy, M. H.; and Hamdy, I. R. (1996). Effect of Nigella sativa on egg production, hatchability percentage and some biochemical values in laying hens with reference to fertility in cockerels. 7th Sci., Cong., Fac. Vet., Med., Assuit Univ., 17-19 Nov., 1996. Ass. Egypt

Konjufca, V. H.; Pesti, G. M.; and Bakalli, R. I. (1995). The influence of dietary garlic powder on the cholesterol content of broiler chickens. Poultry Sci., Supplement 1, Abstr. No, 43: page 15.

Konjufca, V. H.; Pesti, G. M.; and Bakalli, R. I. (1997). Mudulation of cholesterol levels in broiler meat by dietary garlic and copper. Poult.Sci., 76: 1264-1271

Mandour, A. A.; Ashry, K. M.; and Heday, S. A. (1998). Biochemical profile of serum constituents of broiler chickens supplemented with different level of Nigella sativa (black seeds) with special mineral concentration. Egypt, Poult. Sci., 18: 429-439.

Mandour, A.; Mahmoud, K.; Abou El-Wafa, A.; El-Agamy, E.; and Ragab, . (1995). Effect of aflatoxin and Nigella sativa seeds on serum

proteins and its electrophoretic patterns in White Pekin ducklings. 1st Egyptian Hungarian Poultry Conference.17-19 Sep. Alex.Egypt.

Mohamed, F.R., M.S. Salwa, A.K. Alm El-Din (2000). The influence of garlic and onion on productive performance and some physiological traits I laying hens. Egyptian Poultry Sci., 20 (I): 123 – 144.

Nair, S.C.; Salomi, M. J.; Panikkar, B.; Panikkar, K. R. (1991). Modulatory effect of crocus sativa and Nigella sativa extracts on cisplantin-induced toxicity in mice. J. Ethnopharmacol Limerick; Elsevier Scientific Publishers. V:31(I)P. 75-83.

Prasad, J.; and Pandey, R. C. (1995). Effect of different levels of garlic inclusion in the ration of cockerles in their growth rate and feed conversion ratio. Poultry Adviser, (27) 6: 39-41 (Abstract).

Qureshi, A.; Din, Z. Z.; Abuirmeileh, N.; Burger, W. C.; Ahmed, Y.; and Elson, C. E. (1983a). Suppression of avian hepatic metabolism by solvent extracts garlic:Impact on serum lipids.J.Nutr.,113:1746-1755

Qureshi, A.; Abouirmeileh, N.; Din, Z. Z.; Elson, C. E. and Burger, W. C. (1983b). Inhibition of cholesterol and fatty acid biosynthesis in liver enzymes and chicken hepatocytes by polar fractions of garlic. Lipids, 18: 343-348.

SAS (1998). SAS/STAT user's Guide Release 6.03 Edition, SAS Institute Inc., cary, NC, USA.

Sharma, K.K.; K.K. Dwivedi and S.P. Sharma (1976). Effect of raw and boiled garlic (Allium Sativum L.) on lipids in rabbits. Chem. Abstr. 90: 185–187.

Sharma, R. K.; Singh, R. A.; Pal, R. N.; and Aggarwal, C. K. (1979). Cholesterol content of chicken egg as affected by feeding garlic (Allium Sativum), Sarpagandha (Rowlfia Serpentina) and nicotinic acid. Haryana-Agriculture-University-Journal of Research 9: 263.

Sklan, D.; Berner, Y. N.; and Rabinowitch, H. D. (1992). The effect of dietary onion and garlic on hepatic lipid concentrations and activity of antioxidative enzymes in chicks. J. Nutr. Biochem., 3: 322-325.

Stadleman, W.J. (1977). Quality identification of shell egg in : Egg science and technology. 2th Ed by W.J. Stadleman and O.J. Cotterill pub. AVI was publishing company. Inc. Connecticut USA.

Taha, E. A. T. (1997). Physiological studies on animals: Effect of Nigella sativa (Seed, Cake) on the performance of New Zealand White rabbits. M.Sc. Thesis, Faculty of Agric., Alexandria Univ.

Tollba , A.A.H, and M.S.H. Hassan (2003), Using some natural additives to improve physiological and productive performance of broiler chicks under high temperature conditions-2. black cumin (Aigella sativa) or garlic (Allium sativum).Egypt, Poult.Sci.,23(II):327-340

Zeweil, H. S. (1996). Evaluation of substituting Nigella seed oil meal for soybean meal on the performance of growing and laying Japanese quails. Egypt poult. Sci. Vol. 16 (11):451-477.

تأثير بعض إضافات الأعشاب الطبيعية على الصفات الفسيولوجية والإنتاجية لبعض السلالات المحلية تحت ظروف المناخ الحار

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أجريت هذه الدراسة لمعرفة تأثير بعض إضافات الأعشاب الطبيعية (بذور حبة البركة ومجروش الثوم الطازج) على بعض الصفات الإنتاجية والفسيولوجية للدجاج البياض خلال فصل الصيف حيث ارتفاع درجة الحرارة (٣٨°م-٣٠°م). تم استخدام عدد ١٠٨ دجاجة و١٢ ديك من سلالة البندرة في عمر النضج الجنسي (٢٤) أسبوع وزعت عشوائيا إلى ثلاثة مجموعات متساوية بكل منها ٤٠ طائر في أربعة مكررات كل منها (٩ دجاجات وديك) تم تربيتهم تحت ظروف متماثلة مع إضافة مجروش بذور حبة البركة ومجروش الثوم الطازج بمعدل ٢ % إلى عليقه المقارنة. استمرت التجربة لمدة ١٢أسبوع في فصل الصيف ٢٤-٣٦ أسبوع من العمر (يونية ويوليو وأغسطس).

أوضحت النتائج أن إضافات الأعشاب الطبيعية لم تأثر معنويا على وزن الجسم المكتسب ولكن كان هناك استجابة معنوية للإضافات على العلف المأكول مع تحسن الكفاءة التحولية معنويا . وكانت هناك زيادة معنوية فى إنتاج البيض (معدل وكتلة)وكذلك زيادة البروتين الكلى ومستوى هرمون تراي أيودوثيرونين Triiodothyronine (T_3) في بلازما الدم مع إضافة مجروش الثوم فقط. كما أدت إضافات الأعشاب الطبيعية إلي زيادة معنوية في وزن كل من الغدة الثيموثية وغدة الدرقية بينما وزن الطحال لم يتأثر. كما أدت إلى انخفاض معنوي في مستوى الكولسترول والدهون الكلية في بلازما الدم وكذلك في الكبد وفى صفار البيض وكذلك تركيز الجلوكوز في بلازما الدم. بينما لم يتأثر معنوياً كل من تركيز الكريياتين وإنزيمي GOT and GPT في بلازما الدم. وكانت هناك تحسن عددي فقط في كل من نسبة الخصوبة والتفريخ ووزن الكتاكيت وجودة البيض الناتج .

يستخلص من النتائج أنة ينصح باستخدام إضافات الأعشاب الطبيعية المختبرة (ويفضل مجروش الثوم) في علائق الدجاج البياض وخاصة في الأجواء الحارة لزيادة إنتاج البيض والعلف المأكول وتحسين معدل التحويل الغذائي وخصائص الدم وخفض مستوى الكولسترول والدهون الكلية في كل من بلازما الدم والكبد وصفار البيض دون حدوث أي آثار جانبية على صحة الإنسان.