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NUTRITIONAL EFFECTS OF LAURUS NOBILIS LEAF MEAL ON GROWTH PERFORMANCE, CARCASS CRITERIA AND SOME BLOOD PARAMETERS OF GROWING DANDARAWI CHICKS

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ABSTRACT: This study was carried out to evaluate the effect of dietary *Laurus nobilis* leaf meal supplementation at different levels (0.5, 1.0 and 1.5%) on growth performance, carcass traits, and some blood parameters of growing Dandarawi chicks. A total of two hundred 7-day-old, unsexed Dandarawi chicks were randomly distributed into four dietary treatments (50 chicks/treatment). Each treatment was subdivided into five replicates containing 10 chicks each. In the first group birds were fed a basal diet without addition and served as control (C). The 2nd group (T1), 3rd group (T2) and 4th group (T3) birds were fed a basal diet supplemented with *Laurus nobilis* leaf meal (LNLM) at levels 0.5, 1.0 and 1.5%, respectively. The experiment lasted at 8 weeks of age. Growth performance, some carcass traits and some blood parameters were determined in this study. The results revealed that Dandarawi chicks fed diet supplemented with LNLM at level 1.5% (T3) had the highest values of final body weight, body weight gain, highest percentages of dressed carcass, breast, and leg muscles, and the best feed conversion ratio, followed by those fed diets supplemented with LNLM at levels 0.5% (T1) and 1.0% (T2) compared with control. Adding LNLM to Dandrawi chicks' diet at all levels tested reduced the blood cholesterol, triglyceride, and glucose levels compared with control. The liver percentage in control was higher than in the other treatments. Based on the results of this study, it can be concluded that the addition of LNLM to Dandrawi chick diets improves growth performance and carcass traits, as well as reducing serum cholesterol, triglyceride, and glucose levels. The high addition level of LNLM (1.5%) showed superiority in most of the parameters measured over the other addition levels (0.5 and 1.0%).

Keywords: *Laurus nobilis*, performance, carcass, blood, Dandarawi chicks.

INTRODUCTION

Recently, organic poultry production has become an important part of the poultry industry, due to the increasing requirements of global markets for organic food free of antibiotics that have negative effects on the health of consumers. Researchers have been encouraged to uncover new sources of growth promoters, antioxidants and anti-inflammatory substances as a result of the recent international trend of decreasing or banning antibiotics and chemicals in poultry industry. Most regions of the world now cultivate medicinal and aromatic plants and herbs. Its uses varied due to its medicinal effectiveness and speedy recovery from diseases without complications, whether in the form of whole herbs, powder, pastes, capsules, and others (Ali, 2020). The inclusion of a large number of medicinal herbs in poultry diets is due to the antioxidant, anti-inflammatory, antibacterial and antidiarrheal effects of some of the chemicals present in them (Ahmad *et al.,* 2017).

A vast variety of bioactive chemicals are contained in herbal plants and their essential oils, which may be beneficial for animal growth and health (Zeng *et al.,* 2015; Gadde *et al.,* 2017). One of the most important medicinal herbs is *Laurus nobilis*, which called in English as bay laurel, bay leaf, Turkish laurel, and called Al-Ghar in Arabic (Patrakar *et al.,* 2012). *Laurus nobilis* (LN) is a commonly grown evergreen tree in many warm regions of the world, mainly in Europe and the United States (Barla *et al.,* 2007). It is a popular dried herb that produces an aromatic essential oil, which is used as a flavoring and spice agent in food preparation (Conforti *et al.,* 2006). According to Abu-Dahab *et al.* (2014), the *Laurus nobilis* leaf (LNL) contains a variety of flavonoids and glycosides, including kaempferol, quercetin, apigenin, luteolin, and quercetin. Nafis *et al.* (2020) reported that the main essential oils in LNL are eucalyptol, α-terpinyl acetate and methyl eugenol. In addition to their antioxidant properties, LNL essential oils exhibit outstanding antibacterial activity (Rebickov *et al.,* 2020). Saalu *et al.* (2011) indicated that LNL contain antioxidants. Matsuda *et al.* (*2002*) suggested that the LNL can be used in poultry diets to enhance the secretion of gastric juice and thus improving digestion. In addition, Fdam *et al.* (2016) indicated that broilers fed diets supplemented with LNL had the best productive performance and carcass characteristics compared with control. Also, Al Rubaee (2018) stated that adding LNLM to diets for meat type quails at levels of 1, 2 and 3% significantly improved dressing percentage and carcass traits. As well as, Fayed and Azoz (2018) revealed that New Zealand rabbits received LNL in their diets at 1% had higher growth performance as compared to those in control. According to Nafea *et al.* (2018), using high levels of LNL in diets for broilers led to a significant decrease in count of harmful bacteria. Moreover, Ali *et al.* (2020) demonstrated that including crushed LNL in broilers diets significantly enhanced immunity. However, Bulbul *et al.* (2015) illustrated that there were no significant differences in growth performance for quail fed diets supplemented with LN oil at 100,200 and 400 mg/kg. Also, Palazzo *et al.* (2020) illustrated that adding LNLM in diets for growing rabbits at 1 g/kg has no effect on body weight or body weight gain.

Therefore, this current experiment was designed to evaluate the effect of adding different levels of LNLM in diets on growth performance, carcass traits and some blood parameters of growing Dandarawi chicks.

MATERIALS AND METHODS

The present study was conducted at Poultry Farm, Animal Production Department, Faculty of Agriculture, Azhar University, Assuit branch, Assiut, Egypt. during August and September 2021.

Birds, diet, experimental design, and managerial procedures.

The Dandarawi chicks used in this experiment were obtained from the hatchery of animal production department, Faculty of Agriculture, Al-Azhar University (Assiut branch), Assiut, Egypt, and reared for 7 days of age as adaptation period. At the 7^{th} day of age, a total number of two hundred unsexed Dandarawi chicks with an average body weight of

59.81±0.45 were individual weighted and randomly distributed into four dietary treatments (50 chicks/ treatment), each treatment was subdivided into five replicates containing 10 chicks each. Corn-soybean meal basal diet was formulated to meet all nutrient requirements of growing pullets according to the recommendations of NRC (1994). Diet composition and calculated analysis of the diet are illustrated in Table 1. Chicks in the first treatment was fed the basal diet without addition and served as control group (C), while the chicks in the 2nd group (T1), 3rd group (T2) and 4th group (T3) were fed the basal diet supplemented with LNLM at levels 0.5, 1.0 and 1.5%, respectively. All chicks in each replicate were housed in floor pens with 5 cm of saw dust litter. Feed and fresh water were offered *ad-libitum* for all chicks during the whole experimental period. Environmental conditions, hygienic procedure and vaccination programs were performed according to the standard managerial procedures. Birds were exposed to the lighting program of 23 hours light and one hour dark per day to the end of experiment, which depend on natural light and supported by artificial lighting by using incandescent lamps (60 watt).

Laurus nobilis leaf meal preparation

The dried *Laurus nobilis* leaf used in this study was purchased from the local market. After removing the bad leaves, branches, and small stems, the dried leaves were grounded by an electric blender and screened using a sieve of 3 mm to make the *Laurus nobilis* leaf meal, which was added to the experimental diets**.**

Studied Parameters

Growth performance

All chicks were weighted at seven days and 8 weeks of age to determine the initial (IBW) and final body weights (FBW) using a digital balance and recorded to the nearest gram (g). Body weight gain (BWG) was calculated as follows: BWG (g) = final body weight – initial body weight. Total feed consumption (TFC) was recorded during the whole experimental period. Feed conversion ratio (FCR) was calculated according to the following equation: FCR (g feed/ g gain) = feed consumption (g) /body weight gain (g).

Carcass criteria

At the end of the experiment (8 week–old), six birds were randomly chosen from each group around average body weight, all birds were individually weighed as pre-slaughter weight and then slaughtered after being fasted for 8 hours by cutting the jugular vein. After complete bleeding, the birds were scalded and plucked to remove the feather. After that, the carcass was eviscerated to obtain the dressed carcass weight and expressed as relative to live body weight. Additionally, breast, thigh with drumsticks, back, wing, nick, liver, heart, empty gizzard, spleen and bursa were obtained, weighed and expressed as percentage of live weight.

Blood parameters

During the slaughter process, blood samples were collected from each bird in non-heparinized tubes and centrifuged at 3000 rpm for 10 minutes to obtain blood serum that was separated in Eppendorf's tubes using micropipette and kept at -20° C till biochemical analysis. Serum total protein, albumin, cholesterol, triglyceride, and glucose levels were measured by spectrophotometer using a commercial kit (Spectrum, produced by Egyptian Company for Biotechnology (S.A.E)). While globulin level was calculated as the difference between total protein and albumin.

Statistical analysis

All obtained data were subjected to one way analysis of variance (ANOVA) using General Linear Model (GLM) procedures by SAS software (SAS, 1998). Significant differences among treatment means were separated by Duncan's multiple range tests (Duncan, 1955) with a 5% level of probability. All data obtained were analyzed by using the following Model: $Y_{ij} = \mu + T_i + E_{ij}$

Where; Y_{ij} = an observation; μ = overall mean; T_i = effect of treatment; E_{ij} = random error.

RESULTS AND DISCUSSION

Growth performance

The effect of dietary supplementation of LNLM on growth performance of Dandrawi chicks are presented in Table (2). Results indicated that there was significant (P<0.01) improvement in FBW, BWG and FCR with LNLM addition to growing Dandarawi chicks' diet at all levels. Hence, the greatest value of the previous parameters was noticed due to adding the highest level of LNLM (1.5%), T3, to growing chickens diet compared with other levels (0.5 and 1.0%), T2 and T3, while the lowest (P<0.01) values were noted in control group. Results indicated that there were no significant differences in FBW, BWG and FCR between birds in T1 and those in T2 groups. There was no significand difference in FC among all dietary treatments.

The improvement in productive performance for birds received LNLM in their diets may be due to that its leaves contain some potent antioxidants which are known to promote and stimulate digestion, including flavonoids, linalool and phenols (Cabuk *et al.*, 2006; Giannenas *et al.*, 2010). The combination of these substances in laurel leaf may promote the production of digestive enzymes like trypsin, amylase, and chymotrypsin lipase (Milan *et al.*, 2008). According to Nafis *et al.* (*2020*) and Tometri *et al.* (*2020*), the enhancement in growth performance may be attributed to the remarkable antimicrobial effects of bay laurel against harmful bacteria which lead to increasing of beneficial bacteria content in the digestive system and antioxidant effect. Also, Fayed and Azoz (2018) reported that LNL significantly improved digestion coefficient of ether extract, crude protein, nitrogen free extract, crude fiber and nitrogen balance. Ali and Al-Shuhaib (2021) indicated that the extraordinary function of LNL in enhancing feed digestion and absorption ability accounts for the notable improvement in FCR. This is because the length and depth of the villi have increased, increasing the utilization of nutrients and decreasing the amount of undigested feed in the digestive system. The highest productive performance for birds fed LNLM in their diets may be attributed to the medical phenolic substances such as Eugenol, terpenol, and cinole that have an effective anti-bacterial and anti-fungal role. In addition to phenols as a source of antioxidants, it also improves the internal environment of birds by enhancing the activity of antioxidant enzymes like catalysis, peroxidase, and superoxide dismutase (Hamody *et al.,* 2021).

These results are in agreement with those of Fdam *et al.* (2016) who stated that broilers fed diets supplemented with LNLM at 3 and 6 g/kg had the greater (P<0.05) body weight (BW) and BWG values and a better FCR than those fed control diet; however, the differences in feed consumption were not significant among all groups. In the same way, Al-Rubaee (2018) reported that FBW was significantly (P<0.05) increased by adding LNLM at 0, 1, 2 and 3% in diets for quails. Also, Ali and Al-Shuhaib (2021) explained that the highest (P<0.05) values of BW, BWG and FCR were observed for broilers received LNLM at 1, 2, and 3 g/kg diet as compared to birds in control group. In other species, Fayed and Azoz, (2018) and Salim *et al.* (2021) reported that addition of LNLM in diets for New Zealand rabbits significantly enhanced growth performance compared with control.

On the other hand, our findings disagreed with the results obtained by Karaalp *et al.* (2011), who stated that BW at 54 or 124 days of age and FCR were not significantly affected by using LNLM at levels 2 or 4 g/kg diet for quail. Furthermore, Bulbul *et al.* (2015), found that LN oil did not have significant effects on FBW, BWG and FCR when added in diets at levels 100,200 and 400 mg/kg for quail. In addition, Palazzo *et al.* (2020) demonstrated that LNLM at 1 g/kg feed had no effect on BW or BWG for rabbits.

Carcass criteria

The effect of the dietary supplementation of LNLM on carcass criteria of Dandrawi chicks are shown in Table (3). The present study revealed that the highest (P<0.01) percentages of dressed carcass and thigh with drumstick were observed for birds in T3 group, followed by those in T1 and T2 groups, while the birds in control group had the lowest (P<0.01) values. Data showed that there were no significant differences between T1 and T2 groups in dressing carcass and thigh with drumstick percentages. As well as, the present results indicated that birds received LNLM in their diets at different levels had the highest (P<0.05) values of breast percentage weights as compared to those fed control diet. Data stated that the differences in breast% were not significant among T1, T2 and T3 treatments. The relative weight of liver was significant (P<0.01) higher in control group as compared to other groups, with no significant differences among T1, T2 and T3 treatments. On the other side, the dietary supplementation of LNLM had no significant effect on relative weight of wings, nick, back, heart, gizzard, spleen and bursa of Dandrawi chicks at 8-week-old.

The significant improvement in dressed carcass, breast and thigh with drumstick percentages for birds fed diets supplemented with LNLM may be attributed to high live body weight as compared to those fed control diet (Yesilbag *et al.*, 2012; Bulbul *et al.*, 2015). Zangana and Al-Mashhadani (2017) indicated that there is a high positive correlation between live body weight and dressing percent. The significant decrease in liver % for chicks fed diets supplemented with LNLM could be attributed to high content of minerals in this plant (*Laurus nobilis* L.) that can motivate many enzymatic systems in the liver and consolidate metabolism (Weber *et al.*, 2012).

These results are in agreement with those of Al Rubaee (2018), who found that the adding LNLM to the diets of meat type quail at levels 1, 2 and 3% significantly (P<0.05) increased percentages of dressing carcass, breast, thigh and drumsticks while, significantly (P<0.05) decreased liver % as compared to control however, the LNLM had not significant effects on percentages of neck, back and heart. In rabbits, Ibrahim (2005) observed that rabbits fed diets supplemented with different levels of LNLM had the highest (P<0.05) percentages of dressing carcass compared to those fed control diet. Also, Fayed and Azoz (2018) showed that addition of LNLM in diet of New Zealand rabbits at level 1% significantly (P<0.05) improved percentages of carcass dressing and total edible parts. Furthermore, Palazzo *et al.* (2020) illustrated that the growing rabbits fed diet supplemented by LNLM at 1 g/kg had the best (P<0.05) dressing carcass percentage compared with those in control group. As well as, Salim *et al.* (2021) revealed that adding LNLM to the diets of New Zealand rabbits at levels 1, 2 and 4 g /kg had not significant effects on relative weight of spleen.

In contrast, Bulbul *et al.* (2015) indicated that carcass weight and percentage of liver were not affected by LN oil 100,200 and 400 mg/kg diets for quail. Also, Ismoyowati and Sumarmono (2016) stated that using LNL in diets of Mallard ducks at 6-9% had no significant effect on dressing carcass percentage.

Blood parameters

The effect of LNLM on some serum parameters is presented in Table (4). Data explained that there were no significant differences among all groups in the levels of blood total protein, albumin, globulin, and A: G ratio. However, the lowest (P<0.01) cholesterol level was noted in T3, followed by T1 and T2 groups, the highest value (P<0.01) was obtained in control one. However, there were not significant differences between T1 and T2 groups in cholesterol levels. Also, the present study showed that dietary supplementation of LNLM at levels 0.5, 1.0 and 1.5% significantly (P<0.05) reduced serum glucose and triglyceride levels as compared to control group, with no significant differences among T1, T2 and T3 treatments.

The reduction in serum total cholesterol and triglycerides levels for birds received LNLM may be attributed to the antioxidant compounds in LNL (Karaalp *et al.*, 2011), or flavonoids of bay leaf (AL-Samarrai *et al.*, 2018). Flavonoids play an important role in enhancing lipids profile (Nabavi *et al.*, 2012). Bao *et al.* (2016) indicated that the levels of triglycerides and total cholesterol were reduced by flavonoids. As reported by Hertog *et al*. (1993), the antioxidant has the ability to stop the formation of atherosclerotic plaque as well as the oxidation of unhealthy LDL cholesterol. Asadi-Samani *et al.* (2014) reported that hyperlipidemia and atherosclerosis may be decreased by medicinal plants. According to Agung (2021), because LNL contain flavonoids, including quercetin, giving it as extract helps lower blood cholesterol levels. By lowering the tocopherol concentration of LDL particles, quercetin can stop the oxidation of LDL modified by macrophages. Inhibiting the enzyme HMG-CoA Reductase is another way flavonoids function to lower blood cholesterol levels by reducing cholesterol production. *Laurus nobilis* leaf is used as a good and common source of vitamin A (Batool *et al.*, 2020), vitamin A may be reducing cholesterol and triglycerides levels because it allows a sufficient nutrient intake and an important approach for health promotion (Kucuk *et al*., 2003). Thakare (2004) explained that the reduction in glucose levels after treatment with LNL may be the result of an increase in non-glutathione-binding proteins, which helped to regulate the metabolism of many nutrients in avian blood, including glucose.

These results in harmony with the findings obtained by Ali (2020), who reported that broiler chickens fed diets supplemented with LNLM at 1, 2 and 3g/kg during the period of 1-35 days of age had the lowest (P<0.05) values of plasma glucose, cholesterol and triglyceride levels while, plasma total protein and albumin were not significantly affected. As well as, Hamody *et al.* (2021) mentioned that quail birds received LNLM in diet at 1% had the lowest (P<0.05) serum cholesterol level as compared to control group during the period of 60-120 days of age, they added that LNLM had not significant effects on serum albumin. In rabbits, Ibrahim (2005) revealed that adding of LNLM to rabbit diets at level of 1% had no significant effect on blood total protein, albumin and globulin, but significantly (P<0.05) reduced serum total cholesterol and triglycerides levels compared with control. Furthermore, Karaalp *et al.* (2011) illustrated that blood total cholesterol and triglyceride concentrations were significantly (P<0.05) reduced for laying quails fed diets supplemented with LNLM at levels 2 and 4g /kg during the period of 60 and 54 days to 10 weeks of age. Additionally, Fayed and Azoz (2018) noted that LNL had not significant effects on serum total protein, albumin and globulin concentrations for male growing New Zealand White rabbits during the period of 5-8 weeks of age while, rabbits received LNL in their diets had the lowest (P<0.05) values of serum cholesterol and triglycerides levels as compared to the control group. As well as, AL-Samarrai *et al.* (2018) stated that oral administration of LNL at 100 mg/kg to Iraqi rabbits significantly (P<0.05) reduced total cholesterol and triglycerides levels compared to control.

However, Ali (2020) indicated that plasma globulin was significantly (P<0.05) increased by supplementation of LNLM to broiler chicken diets at levels of 1, 2 and 3g/kg during the period of 1-35 days of age compared with control. Furthermore, Hamody *et al.* (2021) found that serum protein and globulin levels were significantly (P<0.05) increased by adding LNLM to quail diets at 0.5, 1 and 1.5% compared with control group during the period of 60-120 days of age, however, laurel leaf had no effect on triglyceride level. In the same trend for rabbits, Abdel-Azeem *et al.* (2018) reported that adding LNL in diets for mature New Zealand White rabbits at level 1% significantly (P<0.05) increased plasma total protein and albumin compared with control group. Moreover, Salim *et al.* (2021) explained that there are no significant differences in serum total cholesterol and triglycerides for New Zealand White rabbits when fed diets LNLM at levels 1, 2 and 4g/kg during the period of 5-13 weeks of age.

CONCLUSION

From the current study it can be concluded that the addition of LNLM to Dandrawi chick diets improves growth performance and carcass traits, as well as reducing serum cholesterol, triglyceride, and glucose levels. The high addition level of LNLM (1.5%) showed superiority in most of the parameters measured over the other addition levels (0.5 and 1.0%).

Table (1): Composition and analysis of the experimental diet

Ingredients	**%**
Yellow corn (8.8%)	65.12
Soybean meal (44%)	23.73
Gluten (60%)	2
Wheat bran	5
Dicalcium phosphate	2.5
Limestone	1
Premix[1]	0.3
Sodium Chloride	0.35
Total	100
Calculated analysis	
ME, k cal/kg diet	2850
Crude protein	18.2
Crude fiber	3.74
Crude fat	2.86
Lysine	0.9
Methionine	0.33
Calcium	1.1
Total phosphorus	0.53

[1]Each 3 kg of vitamin mineral premix: contains: vitamin A, 1200000IU; vitamin D3, 300000IU; vitamin E,700 mg; vitamin K3, 500 mg; vitamin B1 500 mg; vitamin B2 200 mg; vitamin B6, 600 mg, vitamin B12, 3 mg; folic acid, 300 mg; choline chloride, 1000 mg; Niacin, 3000 mg; Methionine 3000 mg; Biotin 6 mg; panathonic acid 670 mg; manganese sulphat, 3000 mg; iron sulphat, 10000 mg, zinc sulphat, 1800 mg, copper sulphat 3000 mg, iodine 1.868 mg, cobalt sulphat, 300 mg; selenium, 0.108 mg.

Table (2): Effect of the dietary supplementation of *Laurus nobilis* leaf meal at different levels on growth performance of Dandrawi chicks aged 7 to 56 days.

Items (g)	**Treatments**				**Sig.**
	C	**T1**	**T2**	**T3**	
IBW	59.81±0.90	59.79±1.10	59.74±0.75	59.78±0.83	NS
FBW	541.81±10.29[c]	578.52±11.48[b]	580.13±10.72[b]	612.51±11.40[a]	**
BWG	482.10±11.75[c]	518.74±12.88[b]	520.40±10.43[b]	552.74±10.83[a]	**
TFC	1195.91±14.48	1203.94±12.18	1199.37±13.90	1189.78±14.94	Ns
FCR	2.48±0.07[a]	2.32±0.05[b]	2.31±0.06[b]	2.15±0.06[c]	**

[a,b and c] Means with different superscripts in the same row are significantly different ($P < 0.05$).

C= Control (fed a basal diet); T1= fed a basal diet +0.5 % of LNLM T2= fed a basal diet +1.0 % of LNLM ; T3= fed a basal diet +1.5 % of LNLM .

Sig. = Significance NS= Not significant; **=Highly significant; IBW= Initial body weight; FBW=Final body weight; BWG= Body weight gain, TFC= Total feed consumption; FCR= Feed conversion ratio.

Table (3): Effect of the dietary supplementation of *Laurus nobilis* leaf meal at different levels on carcass criteria of Dandrawi chicks aged 56 days.

Items (%)	Treatments				Sig.
	C	T1	T2	T3	
Dressing carcass	58.53±1.54^{c}	61.89±1.03^{b}	62.08±1.07^{b}	63.20±1.12^{a}	**
Thigh with drumstick	18.82±0.73^{c}	21.23±0.83^{b}	21.32±0.92^{b}	23.74±0.85^{a}	**
Breast	14.07±0.51^{b}	15.65±0.42^{a}	15.68±0.33^{a}	15.79±0.55^{a}	*
Wings	8.07±0.21	8.29±0.18	8.15±0.08	8.26±0.56	Ns
Nick	4.03±0.27	4.01±0.18	4.11±0.31	3.98±0.19	Ns
Back	13.05±0.43	12.82±0.36	12.97±0.41	12.86±0.69	Ns
Liver	3.56±0.13^{a}	2.61±0.18^{b}	2.73±0.18^{b}	2.53±0.16^{b}	**
Heart	0.58±0.04	0.57±0.02	0.57±0.02	0.54±0.02	Ns
Gizzard	2.58±0.22	2.61±0.19	2.52±0.12	2.54±0.17	Ns
Spleen	0.33±0.05	0.32±0.04	0.35±0.06	0.34±0.02	Ns
Bursa	0.59±0.13	0.64±0.09	0.62±0.10	0.65±0.09	Ns

[a,b and c] Means with different superscripts in the same row are significantly different ($P< 0.05$).
C= Control (fed a basal diet); T1= fed a basal diet +0.5 % of LNLM; T2= fed a basal diet +1.0 % of LNLM ; T3= fed a basal diet +1.5 % of LNLM
Sig. = Significance NS= Not significant; *= significant **=Highly significant

Table (4): Effect of the dietary supplementation of *Laurus nobilis* leaf meal at different levels on some serum parameters of Dandrawi chicks aged 56 days.

Parameters (mg/dl)	Treatments				Sig.
	C	T1	T2	T3	
Total protein	4.59±0.10	4.88±0.26	4.84±0.08	4.91±0.18	NS
Albumin	2.73±0.20	2.85±0.08	2.86±0.19	2.91±0.07	Ns
Globulin	1.86±0.22	2.03±0.32	1.98±0.18	2.00±0.24	Ns
A:G ratio	1.47±0.19	1.41±0.46	1.45±0.24	1.46±0.31	Ns
Cholesterol	179.00±5.73^{a}	163.30±5.67^{b}	161.70±6.10^{b}	152.35±5.39^{c}	**
Glucose	193.53±11.69^{a}	161.26±9.05^{b}	164.62±9.83^{b}	158.32±8.86^{b}	*
Triglyceride	98.16±2.47^{a}	81.93±1.98 ^{b}	83.59±2.04^{b}	80.15±3.22^{b}	*

[a,b and c] Means with different superscripts in the same row are significantly different ($P< 0.05$).
C= Control (fed a basal diet); T1= fed a basal diet +0.5 % of LNLM T2= fed a basal diet +1.0 % of LNLM ; T3= fed a basal diet +1.5 % of LNLM
Sig. = Significance NS= Not significant; *= significant **=Highly significant

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الملخص العربي

التاثيرات الغذائية لمسحوق اوراق اللورا على اداء النمو، صفات الذبيحة وبعض قياسات الدم لكتاكيت الدندراوي النامية

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اجريت هذه الدراسة لتقييم تاثير الاضافات الغذائية لمسحوق اوراق اللورا عند مستويات مختلفة على اداء النمو، صفات الذبيحة وبعض قياسات الدم لكتاكيت الدندراوي النامية. تم تقسيم عدد 200 كتكوت دندراوي عمر 7 ايام بشكل عشوائي الى 4 معاملات غذائية (50 كتكوت / معاملة)، تشتمل كل معاملة على 4 مكرارات بكلا منها 10 كتاكيت. غذيت المعاملة الاولى على عليقة اساسية بدون اضافة واعتبرت مجموعة مقارنة. بينما غذيت المعاملات الثانية (T1) والثالثة (T2) والرابعة (T3) على عليقة اساسية مضافا اليها مسحوق اوراق اللورا بمستويات 0.5، 1.0 و1.5 %، على الترتيب. استمرت التجربة حتى عمر 8 اسابيع. وتم في هذه الدراسة قياس اداء النمو وصفات الذبيحة وبعض قياسات الدم. اشارت النتائج الى ان كتاكيت الدندراوي التي تغذت علائق مضاف اليها مسحوق اوراق اللورا بمستوى 1.5% كان لديها اعلى قيم لوزن الجسم النهائي، وزن الجسم المكتسب، معامل التحويل الغذائي واعلى نسب المئوية لاوزن الذبيحة المجهزة وعضلات الصدر الرجل ,وافضل معامل تحويل غذائي يليها تلك التي غذيت على علائق مضاف اليها مسحوق اوراق اللورا بمستويات 0.5 و1.0 % مقارنة بمجموعة المقارنة. أدت إضافة مسحوق اوراق اللورا إلى علائق كتاكيت الدندراوي عند جميع المستويات التي تم اختبارها إلى خفض مستويات الكوليسترول في الدم والدهون الثلاثية والجلوكوز مقارنة مع مجموعة المقارنة. وكانت نسبة المئوية للكبد في مجموعة المقارنة اعلى من المعاملات الأخرى. بناء على نتائج هذه الدراسة يمكن الاستنتاج أن إضافة مسحوق اوراق اللورا إلى علائق كتكوت الدندراوي أدى إلى تحسين أداء النمو وصفات الذبيحة، فضلا عن خفض مستويات الكولسترول والدهون الثلاثية والجلوكوز في الدم. أظهر مستوى الإضافة العالي لمسحوق اوراق اللورا (1.5%) تفوقاً في معظم القياسات المختبرة على مستويات الإضافة الأخرى (0.5 و 1.0%).