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Response of performance and some blood traits of quail to bay laurel (*Laurus nobilis* L.) leaf powder supplementation

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Abstract

There are many medical compounds in bay laurel leafs includes Thymol, Carvacrol, Cinnamaldehyde, Eugenol, and Nonoterpenes besides it contains antioxidants like phenols and its ability to resist the growth of pathogenic bacteria and fungus. So this study was conducted to measure the Response of performance and some blood traits of quail to bay laurel *(Laurus nobilis* L.) leaf powder supplementation by 0, 1. 2 , 3% to the diets fed to 180 seven days old met type quail distributed to four treatments with three replicates for each treatment (15 bird /replicate) . the results showed no differences between experimental treatments for live body weight , weight gain and feed consumption but some differences were noticed for feed conversion ratio in favor of to bay laurel leaf powder supplementation. VLDL and triglyceride decreased significantly by adding bay laurel leaf powder.

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Introduction

The current development of poultry industry opened a new horizons to find dietary supplementation which can enhance performance and immune system , phytogenics are one of these supplements . they are used as save replacement for antibiotic (Burt, 2004) and they can increase secretion of digestion enzymes (Langhout , 2000) . Laurus nobilis L. is a medicinal herb, it leafs contains many effective compounds including Cineole, Eugenol, Linalool, Methyl, Lactonol (Akunnna *et al.*, 2013, Dias *et al.*, 2014). Bay laurel leafs are used in ethnic medicine for the diseases liver, kidneys, digestive system as well as use as a condiment (Ulkuhan *et al.*, 2012, Yahya *et al.*, 2015). Bay leafs have the ability to defense the body against free radicals and carcinogenics by favons, tannins , alkaloids and phenols (Akunnna *et al.*, 2013. Guenane *et al.*, 2016). It also contains vitamins A, C, niacin , Riboflavin and pyridoxine. it also has a good amount of potassium, Iron, Zinc, Calcium, Magnesium, Manganese and copper (Dandapat *et al.*, 2013, Marius and Leve; 2015). In many researches bay laurel leafs or its oils were used to improve performance and carcass traits of poultry (Simsek *et al.*, 2007, Bricick *et al.*, 2012). Some studies used Bay leafs powder as stress limiting factor (Nadia *et al.*, 2008). There is a few studies about using Bay Laurel leafs in quail diets and its effect on performance of meat type quail, the aim of this experiment is to evaluate the supplementation of Bay Laurel leaf on meat type quail performance and some blood traits.

Materials and methods

Dry bay laurel (*Laurus nobilis* L.) leaf was purchased from a local market in Baghdad, Iraq and grounded to powder for further use. A total of 180 seven day old quails were raised according to social and behavioral research ethics committee. Chicks were weighed individually and randomly allocated to 4 dietary treatments. Feed and water were available ad libitum. Experiment was carried out in a completely randomized design with 4 treatments, each had 3 replicates with 15 birds/replicate. diet were formulated according to the requirements of NRC (1994) (Table 1). The experimental groups were as follows: Group I (control) fed a basal diet, Group II fed the basal diet + 1% bay laurel (*Laurus nobilis* L.) leaf powder, Group III fed the basal diet + 2% bay laurel (*Laurus nobilis* L.) leaf powder, Group IV fed the basal diet + 3% bay laurel (*Laurus nobilis* L.) leaf powder. Continuous lighting program (23 hours lightning: 1hour darkness) was provided. birds were individually weighed once a week to obtain the average live body weight and body weight gain. Feed intake was recorded weekly to calculate feed conversion ratio. At 42 days of age blood samples were collected from six birds from each treatment from the brachial vein. blood samples were collected in tubes without anti coagulant to get the serum using centrifugation at 3000 rpm/min for 15 minute . serum was frizzed at -20°C for later testing blood VLDL, globulin , albumin, Total protein, triglycerides, cholesterol, GOT, GPT, glucose using a kit made by Biocon© company , Germany . data analyzed with analysis of variances (ANOVA) followed by Duncan Test (Duncan;1955) Differences between treatments were analyzed using Statistical Analysis System (SAS .2012).

Table 1. Dietary* composition of experimental diet.

Ingredients (g/kg)	%
Maize	48
Soybean meal	38
* Protein concentrate *	10
Vegetable oil	3
Limestone	0.7
Salt	0.3
TOTAL	100
Protein %	25.8
ME (Kilocalorie/kg)	2932.74
Met + sys.	0.7
Ca	2.54
Available p.	0.35

*NRC (1994).

**Protein concentrate (50% protein, 2800 kilocalorie, 12% fat, 25% ash, 2.5 % ca, 2.9% p).

Results and discussion

No differences were noticed (table 2) between experimental treatments for live body weight, weight gain and feed consumption but some differences were noticed for feed conversion ratio in favor of to bay laurel leaf powder supplementation, this partial improvement in feed conversion ratio is because of the numerical differences in feed consumption . we can see that bay laurel leaf powder supplementation had no real and profound effect on performance and

production characteristics. These results agrees with the results of karaalp *et al.,* (2011) who found no effect for bay laurel leaf powder supplementation on performance of egg type quail at levels 2 and 4gm/kg of the diet. Bulbul *et al.,* (2015) reported no significant effect for adding bay leaf oil on live body weight, weight gain for quail birds at the age of 54 and 124 days . our present results agrees with the results of bay laurel oil supplementation did not change production characteristics of broiler (Lee *et al.,* 2003, Jang *et al.,* 2007). Our present study result didn't agree with Gill chem (2000) and Cabuk *et al*., (2006) results which recorded increase in live body weight by using bay laurel oil the partial improvement in feed conversion ratio can be attributed to the action of flavones and terpenes which enhance feed conversion (Langer, 1998; Craig,1999, Fdam, 2016).

From Table (3) we can notice The effect of to bay laurel (*Laurus nobilis* L.) leaf powder supplementation on blood VLDL, globulin , albumin , Total protein, triglycerides , cholesterol , GOT, GPT, glucose for quail birds. VLDL decreased significantly by supplementing bay laurel leaf powder. no differences were recorded for albumen levels between experimental diets. globulin level was higher at 1 and 2% supplementing bay laurel leaf powder than other treatments. 1 and 3% supplementation bay laurel leaf powder had significantly higher total protein level than control treatment. While triglyceride drooped significantly by increased supplementation of bay laurel leaf powder. 3% supplementation bay laurel leaf powder had significantly lower cholesterol level while 1% supplementation bay laurel leaf powder had significantly the highest glucose level. The significant decrease of VLDL, cholesterol and triglyceride might be attributed to the action of flavones in bay laurel leaf powder (Badee *et al.,* 2003), it can limit the synthesis of cholesterol and triglyceride by minimizing the activity of HMG- coA reductase who transform *B*- hydroxyl- *B*- methylglutaryl- CoA to Mevalonic acid, beside changing the structure of cholesterol transporting protein (Bujo *et al*; 1997). The presence of vitamin C in bay laurel leaf can lower the cholesterol serum level by stimulatin the thyroid gland (Kuhn *et al*; 1993, Sturkie; 2000). Glucose level decrease is mostly because of stimulating glycogen synthetase and minimizing the activity of glycogen phosphorylase (Kuhn *et al*., 1993; El - Missiry, and El - Gindy. 2000).

Total protein was increased by bay laurel leaf because of its high content of vitamin C who can stop the action of corticosterone which can create by Gluconeogenesis (Freeman; 1988). Cortecostiron limitation lead to limitation the action and the levels of GOT and GPT enzymes (Al Darajy; 2008) . the same reason is behind the increment in the in total protein and the enhancement of immunity be increasing the level of globulin (Satterlee *et al*., 1989, Gross. 1992).

Table 2. The effect of to bay laurel (*Laurus nobilis* L.) leaf powder supplementation on Live body weight, Weight gain, Feed consumption Feed /gain ratio, for quail birds.

Live body weight gm						
treatment	14day	21day	28day	35day	42day	day49
1	50.03±0.26a*	83.13±1.45a	116,.32±2.09a	148.46±6.88a	160.66±0.88a	172.46±2.60a
2	49.53±1.66ab	81.16±2.43a	117.46±3.22a	143.80±5.33a	162.40±3.89a	173.40±1.2a
3	47.66±0.73b	76.46±1.37b	110.43±1.98a	139.46±3.78a	161.20±3.11a	174.23±2.88a
4	51.50±1.21a	83.96±2.28a	111.56±2.20a	143.03±1.66a	164.60±3.91a	175.76±2.98a
Weight gain gm						
treatment	7-14 days	14-21 days	21-28 days	28-35 days	35-42days	42-49 days
1	1.20 a± 33.10	1.81 a± 33.93	31.40±3.75a	22.20±5.34a	21.80±1.72a	21.80 ±1.72a
2	31.63±1.73a	33.30±0.94a	31.33±5.71a	23.60±3.13a	21.00±3.05a	21.00 ±2.05a
3	32.80±1.70a	33.96±2.69a	31.03±2.84a	21.76±1.61a	23.03±3.53a	22.03±1.5a
4	33.46±1.56a	33.60±1.93a	31.46±0.88b	21.50±3.76a	22.23±3.28a	21.23±1.6a
Feed consumption gm						
treatment	7-14 days	14-21 days	21-28 days	28-35 days	35-42days	42-49 days
1	72.36±2.26a	87.46±3.97 a	95.00±2.90a	91.36±2.02a	74.90±3.34a	71.80±2.60a
2	71.13±2.95a	89.03±3.46a	91.33±3.12a	1.86±3.21a9	74.90±1.36a	75.40±3.38a
3	72.10±2.77a	86.80±3.10a	93.30±1.59a	92.96±3.49a	71.56±2.63a	73.73±4.56a

Live body weight gm						
treatment	14day	21day	28day	35day	42day	day49
4	74.10±3.60b	88.96±0.95a	91.90±2.18 a	91.33±0.23a	72.30±3.60a	73.66±4.22a
Feed /gain ratio gm						
treatment	7-14 days	14-21 days	21-28 days	28-35 days	35-42days	42-49 days
1	2.53±0.33b	2.64±0.21b	2.86±0.22a	2.90±0.17a	3.55±0.10a	3.29±0.21b
2	2.66±0.31a	2.75±0.24a	2.66±2.74b	2.93±0.20a	3.17±0.1a	3.54±0.22a
3	2.74±0.27a	2.64±0.22b	2.74±0.21b	2.99±0.18a	3.28±0.19b	3.20±0.12b
4	2.76±0.21a	2.65±0.23b	2.73±0.11b	2.90±0.22a	3.36±0.21b	3.35±0.11b

*The different letters in the same column indicate a significant differences.

Table 3. The effect of to bay laurel (Laurus nobilis L.) leaf powder supplementation on blood VLDL, globulin , albumin , Total protein, triglycerides , cholesterol, GOT, GPT, glucose for quail birds.

Treatment	VLDL	globulin	albumin	Total protein	triglycerides	cholesterol	GOT	GPT	glucose
1	22.70±0.05a*	16.50±0.05c	12.79±0.05a	29.29±0.00d	113.70±0.05a	199.30±0.05b	328.53±0.03a	8.50±0.00d	381.53±0.27b
2	20.80±0.05b	18.50±0.28a	13.70±0.47a	32.53±0.03a	103.85±0.02b	179.13±0.03d	197.16±33.38c	11.20±0.00a	393.56±0.03a
3	12.80±0.05d	17.93±0.48ab	13.57±0.48a	31.50±0.00b	63.86±0.03d	217.30±0.05a	337.43±0.03a	10.80±0.00b	313.46±0.03d
4	14.40±0.05c	17.30±0.15bc	13.00±0a	30.30±0.15c	71.83±0.03c	188.70±0.05c	270.81±0.00b	9.50±0.00c	338.33±0.08c

*The different letters in the same column indicate a significant differences.

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