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Effect of bay laurel (*Laurus nobilis* L.) leaf powder dietary supplementation on dressing percent, carcass traits, carcass cuts and some internal organs of quail

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Key words: Bay laurel leaf, Dressing percent, Carcass, Cuts, Quail.

Abstract

This study was conducted to measure the Effect of bay laurel (*Laurus nobilis* L.) leaf powder dietary supplementation on dressing percent's, carcass trait, carcass cuts and some internal organs of meat type quail by 0, 1, 2, 3% to the diets fed to 180 seven days old meat type quail randomly distributed to four treatments with three replicates for each treatment (15 bird /replicate). The results showed that bay laurel (*Laurus nobilis* L.) leaf powder dietary supplementation significantly by increased live body weight, carcass weight, dressing percent, and percentage weights of breast, drumstick, and thigh cuts. Adding bay laurel leaf powder improve taste, tenderness, and total acceptance of breast meat.

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Introduction

The new international trend to decrease or ban of antibiotics and chemicals in poultry industry was the motive for researchers to find new sources of growth promoters, antioxidants, remedies and anti-inflammation materials (Tipu *et al*; 2006). Thus herbs or photogenic were introduced as active components of the diet who have the ability to boost bird's immunity and performance (Esonu *et al*; 2005).

Bay laurel (*Laurus nobilis* L.) leaf can be used in poultry nutrition to increase gastric fluids to stop digestive disorders (Matsuda *et al*; 2002). It has antifungal, antibacterial potentials (Kumar *et al*; 2001, Muhammad *et al*; 2011). The leafs had many effective substances including Apigenin, Luteolin, Kaempferol, Myricetin, cinole, eugenol, terpenol, Glycosides, ،Quercitin, linalool, Alkaloids, mthyl eugenol, lactonol (Go`mez-Coronado and Barbas, 2003; conforti *et al*. 2006, Yasar *et al*; 2012). So these compounds could have some effects on carcass cuts and its organoliptic traits especially in quails.

There were a few studies about adding Bay laurel (*Laurus nobilis* L.) leaf oil broiler's diets (Osman *et al*; 2010, Ozek *et al*; 2013) and broiler breeder (Alexander *et al*; 2010) in quail Karaalp *et al* (2011) has reported that supplementation of bay laurel leafs (2 or 4g/kg feed) didn't effect on performance or egg quality parameters of quails, the study recorded that supplemented the diet with bay laurel leafs is able to change the biochemical traits of quail egg yolk. Very few scientific experiments done to study the effect of bay laurel leaves on meat type quails and carcass composition and its effect on sensory traits of quail meat. The aim of this current experiment is to study the effect of bay laurel (*Laurus nobilis* L.) leaf powder dietary supplementation on dressing percents, carcass trait, carcass cuts and some internal organs of meat type quail.

Materials and methods

Bay Laurel

source dry bay laurel (*Laurus nobilis L.*) leaf was purchased from a local market in Baghdad, Iraq and grounded to powder for further use.

Birds and Treatments

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. Birds had free access to feed and water. 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.

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).

Carcass Traits

At 49 days of age five birds from each treatment group were slaughtered for measuring carcass weight and dressing percentage, carcass cuts, femur and sternum bones length, body length, intestine length, body index, thigh index, heart and lever and gizzard percentage weight, breast diameter, thigh diameter (USDA. 2013). Sensory meat quality parameters, evaluation was conducted by 25 trained panelists. Breast meat cuts from each treatment were tested as described by Jayasena *et al*. (2013). Using the table of degrees (Table 2).

Table 2. Degrees of breast meat sensory test.

Degree	Odor	Color	Juiciness	Tenderness	Total acceptance
1	Very good	Very good	Very good	Very good	Very good
2	Good	Good	Good	Good	Good
3	Medium	Medium	Medium	Medium	Medium
4	Bad	Bad	Bad	Bad	Bad
5	Very bad	Very bad	Very bad	Very bad	Very bad

Statistical analysis

Data analyzed with analysis of variances (ANOVA) followed by Duncan Test (Duncan 1955) Differences between treatments were analyzed using Statistical Analysis System (SAS 2012).

Results and discussion

The results presented in Table (3) shows a significant increase in live body weight by supplementing 2% bay laurel (*Laurus nobilis* L.) leaf powder which had the highest live body weight by 159.78 gm followed by the rest of the experimental treatments, while control treatment recorded the lowest live body weight. The same differences were noticed for carcass weight and dressing percent. Control birds had significantly the heaviest gizzard and liver weight by 3.06 and 2.91 respectively. No differences were reported for heart percentage weight and intestine length.

Table 3. The effect of bay laurel (*Laurus nobilis* L.) leaf powder dietary supplementation on Live body weight cm, Carcass weight cm, dressing percents, and Gizzard, Heart, Liver percentage weight and Intestine length of quail.

TRT	Live body weight cm	Carcass weight cm	Dressing percent %	Gizzard percentage weight	Heart percentage weight	Liver percentage weight	Intestine length cm
1	143.26±10.11c	95.39±9.35b	66.30±2.05b	3.06±0.65a	1.47±0.20a	2.91±0.21a	54.00±2.00a
2	159.78±7.61a	109.51±6.26a	68.47±1.03a	2.65±0.30b	1.40±0.08a	2.78±0.26b	51.16±2.20a
3	149.06±5.71b	97.42±5.61b	65.18±1.85b	2.78±0.13b	1.40±0.08a	2.72±0.84b	52.50±1.75a
4	152.87±7.99ab	102.90±6.40ab	67.25±0.98ab	2.64±0.28b	1.45±0.09a	2.74±0.94b	52.60±1.80a

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

No significant differences were noticed for body degree of fullness, barest degree of fullness, thigh diameter, sternum length, and thigh bone length (table 4). Control treatment birds had the shortest ($p<0.5$) body length, and breast diameter. the 3% bay laurel leaf powder treatment was longer ($p<0.5$) for leg bone length.

In table (5) we can find many differences in carcass cuts percentage weights. Bay laurel leaf powder supplementation treatments surpassed the control treatment in percentage weights of barest, drumstick, thigh, wings no differences were found for percentage weights of back and neck. The sensory traits of breast meat results (table 6) shown that 3% bay laurel leaf powder treatment had the best ($p<0.5$) taste, tenderness, and total acceptance than the other treatments. Most of the supplementation treatments were significantly higher than control treatments for appearance, odor, color and juiciness.

Table 4. The effect of bay laurel (*Laurus nobilis* L.) leaf powder dietary supplementation on Body length, Body degree of fullness, Breast degree of fullness, Breast diameter, Thigh diameter, leg bone length, Sternum bone length, Thigh bone length of quail.

TRT	Breast %	Drumstick%	Thigh%	Wings%	Back%	Neck%
1	34.14±0.57b	8.44±0.30b	14.24±1.92b	8.48±0.34b	26.92±0.59a	5.37±0.91a
2	34.82±0.76ab	9.65±0.31a	15.73±1.29a	9.49±0.11a	28.80±0.72a	5.42±0.29a
3	34.70±0.37ab	9.18±0.34ab	15.07±0.61a	9.76±0.53a	27.15±0.62a	5.47±1.08a
4	36.94±0.92a	9.06±0.20ab	14.84±0.50ab	9.66±0.21a	26.61±2.20a	5.53±0.69a

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

Table 5. The effect of bay laurel (*Laurus nobilis* L.) leaf powder dietary supplementation on Breast, Thigh diameter, leg bone length, wings, back, and neck percentage weight of the carcass of quail.

TRT	Appearance	Taste	Odor	Color	Juiciness	Tenderness	Total acceptance
1	3.67 b	3.83b	3.50b	3. 70b	3.60b	3.80b	3.87b
2	3.87a	3.87b	3.80ab	3.77b	3.80ab	3.80b	3.83b
3	3.77ab	3.87b	3.83ab	4.00a	4.00a	.87b3	3.87b
4	3.73ab	4.00a	4.07a	3.90ab	4.00a	3.93a	3.97a

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

Table 6. The effect of bay laurel (*Laurus nobilis* L.) leaf powder dietary supplementation on breast meat Appearance, Taste, Odor, Color, Juiciness, Tenderness, Total acceptance of quail.

TRT	Body length cm	Body degree of fullness	Breast degree of fullness	Breast diameter cm	Thigh diameter cm	leg bone length cm	Sternum length cm	Thigh bone length cm
1	7.64±0.30b	12.40±0.89a	1.57±0.07a	11.03±0.25b	4.92±0.13a	3.82±0.02b	3.36±0.04a	4.62±0.07a
2	8.26±0.10a	12.17±0.60a	1.62±0.18a	12.26±0.45a	5.22±0.09a	3.96±0.06ab	3.31±0.24a	4.85±0.09a
3	8.71±0.34a	12.95±0.66a	1.53±0.03a	12.85±0.62a	5.34±0.18a	3.94±0.05ab	3.41±0.07a	4.84±0.03a
4	8.16±0.30a	12.59±0.66a	1.53±0.08a	12.49±0.58a	5.13±0.36a	4.06±0.06a	3.41±0.08a	4.79±0.07a

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

Japanese quail birds have a small condensed body compacted with meat (Rogerio, 2009), they have a 60%-80% dressing percent which is higher than broiler's (Naji *et al*., 2009). The results of the current study agrees with those of Biricik *et al* (2012) who found a significant increase in live body weight by supplementing essential oils to quail diets, and with the results of Alcicek *et al* (2003) who fed essential oils of bay laurel (*Laurus nobilis* L.) contains linlool, cineole, methyl eugenol which are present in bay laurel (*Laurus nobilis* L.) leaf powder (Ozek *et al*., 2000; Kacukyilmaz *et al*., 2012).

There is high positive correlation between live body weight and dressing percent (Zangana and Al-Mashhadani., 2017) so by the increase in live body weight we had an increase in dressing percent, this agrees with the results of this current study. The same trend of differences in live body weight was noticed for dressing percent. The improvement of carcass yield and carcass cuts is attributed live body weight improvement (Yesilbag *et al*., 2010, Bulbul *et al*., 2015).

The dressing percent results in our results agrees with Simsek *et al*., (2007) results in improving dressing percent and carcass cuts by adding herbal mix. it also agrees with the findings of AlKhateeb (2017) who added herbal mixtures to quail diets, he recorded an increased metabolic rate and bone and muscle development which lead to increased dressing percent by herbal mixture supplementation.

Eugenol in bay laurel (*Laurus nobilis* L.) leaf powder enhanced the growth of beneficial bacteria (Agostini *et al*., 2012) like lactobacillus and depress the harmful bacteria such a *E. coli* in the intestine (Ordonez *et al*., 2008), this action can improve general health and nutrient availability and performance in poultry (Weber *et al*., 2012). Bay laurel (*Laurus nobilis* L.) leaf powder had a high content of minerals that can motivate many enzymatic systems in the liver and consolidate metabolism (Gwaad and Gwaad, 2017). This explains the decreased liver and gizzard weights by bay laurel (*Laurus nobilis* L.) leaf powder supplementation. these results didn't agree with those of Bulbul *et al*., (2015) who didn't notice any differences in liver and gizzard weights when feeding bay laurel (*Laurus nobilis* L.) oil to quail birds.

the higher bone length results in the current study is an index to higher live body weight and bay laurel (*Laurus nobilis* L.) leaf powder content of Ca and Zn (Gwaad and Gwaad., 2017).long bones means long skeletal muscles especially in t and thigh cuts (AlHajo., 2005).

Bay laurel (*Laurus nobilis* L.) leaf has been used as food condiment, its used to give cooked meat flavor and tenderness. our present results of sensory breast meat traits agrees with those of Toghyany *et al*., (2010) and AlSultan (2003), both fed herbal mix to broilers and found improvement in sensory traits of meat, this might be due increased water holding capacity of the breast meat of birds fed with bay laurel (*Laurus nobilis* L.) leaf powder in which the polyphenols that can ameliorate meat quality (Liu *et al*., 1992. Bostoglou *et al*., 2002) also the addition of herbs can inhibit poultry meat spoilage by bacteria and give positive sensory perception (Samant *et al*., 2015).

Conclusion

All The dietary supplementation levels (1, 2, and 3 %) of bay laurel (*Laurus nobilis* L.) leaf powder had a positive effect on dressing percents, carcass trait, carcass cuts of quail birds.

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