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IMPACT OF CUBEB (*PIPER CUBEBA*) AND TURMERIC (*CURCUMA LONGA*) DIETARY INCLUSION ON BROILER'S PERFORMANCE AND CARCASS CUTS

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Abstract

This experiment was conducted in the Poultry Field of the Department animal Production at the Ministry of science and technology. 360 day-old chicks (Ross-308) were weighed and distributed randomly to 18 cages by six treatments, each treatment included three replicated for each repeater 20 birds. Medicinal plants were added to the diets with concentration as follows: (T1 control), Turmeric 0.2% (T4), Turmeric 0.4% (T3), cubeb 0.2% (T4), cubeb 0.4% (T5), Turmeric 0.2% + cubeb 0.2% (T6). Chicks were fed on a diet from 1-35 days of age. Results showed that the experimental diets significantly ($p \leq 0.05$) increased the performance traits at which includes live body weight, weight gain, feed consumption and feed conversion comparing with the control treatment that recorded the lowest performance means. There were no significant variations between the experimental and the control treatment concerning dressing percent and carcass cuts.

Key words: *Piper cubeba*, *Curcuma longa*, performance, broiler, carcass cuts.

Introduction

Antibiotic are already used as growth promoters in broiler's diets to manage pathogenic organisms found in the bird's intestinal lumen (Murugesan *et al.*, 2015) However, their vast use may enhance microbial resistance to antibiotics utilized in human remedies, resulting in the research of substitute products for them. Medicinal plants were used for treating lots of health difficulties in poultry and also to enhance their health. These organic medicinal plants Improves stomach environment and boosts protection through The role of being anti-bacterial plus antifungal (Rajput *et al.*, 2012) Several reports were documented advocating the useful outcomes of dietary turmeric on growth performance of broilers. Al-sultan (2003) located that dietary turmeric at the level of 5g/kg increased live body weight and feed conversion ratio of broilers. Durrani *et al.*, (2006) observed that supplementation of 5 g/kg turmeric to the diets resulted enhanced weight gain and feed efficiency with none adverse outcomes on mortality.

The Piper family (Piperaceae), incorporates for instance, dark pepper (*Piper nigrum*), white and green pepper, Cubeb (*Piper cubeba*) which also called Java pepper. Pepper is an incredibly rich wellspring of vitamins C and E (Azouz, 2001, Abdo *et al.*, 2003, Lee *et al.*, 2010). Hot pepper (capsaicinoids) may have a stimulant, disinfectant and stomach related impact because of capsaicin (Chevallier, 1996) helps carbohydrates digestion (Yoshika *et al.*, 1995; 1999) and works as neural activator (Gowda *et al.*, 2008). Wiliams and Kienholz (1974) inferred that piper powder levels 1.5, 3, 6 or 12% of diet had no critical impact on mortality of broilers. Vogt *et al.*, (1989), Al-Harthi (2002) and Abdo *et al.*, (2003) said that HP improved performance of chicks by 0.3% HP level (Roben *et al.*, 1996; Al-Harthi, 2002). Moreover, Lee *et al.*, (2010) revealed that pipper upgraded resistance and insurance against Eimeria acervulina contamination.

Materials and methods

This experiment was conducted in the Poultry Field of the Department animal Production at the ministry of science and technology. 360 day-old chicks (Ross-308) were weighed and distributed chicks randomly to 18 cages

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Table 1: The composition and calculated analysis of experimental diets.

Ingredient	Starter	Finisher
Corn	52.10	54.00
Soybean meal	21.30	19.30
Vegetable oil	1.20	1.20
Rice bran	16.80	17.70
Fish meal	5.00	4.00
Calcium carbonate	0.80	1.00
Premix	0.80	1.00
Methionine	1.00	0.90
Lysine	1.00	0.90
Total	100	100
Total Nutrient Composition NRC (1994)		
ME (kcal/kg)	2900.71	2902.62
Crude Protein (%)	20.32	19.02
Crude Fat (%)	5.04	5.09
Crude Fiber (%)	6.22	6.31
Methionine (%)	1.26	1.14
Lysine (%)	1.55	1.42
Calcium (%)	1.24	1.36
Phosphor (%)	0.72	0.68

by six treatments, each treatment included three replicated for each repeater 20 birds. Medicinal plants were added to the diets (Table 1) with concentration as follows: (T1 control), Turmeric 0.2% (T4), Turmeric 0.4% (T3), cubeb 0.2% (T4), cubeb 0.4% (T5), Turmeric 0.2% + cubeb 0.2% (T6). Chicks were fed on a diet from 1-35 days of age.

Turmeric powder and Cubeb pepper were obtained from local and then manually mixed with a small amount of feed quantity with good mixing until homogenization was achieved between the feed, lighting program (23 hrs lightning: 1 hour darkness) had been provided. Birds were ingularly weighed once a 7 days to obtain the live body weight in addition to body weight gain. Feed consumption was recorded weekly in order to calculate feed conversion ratio. Data were analyzed by analysis of variances (ANOVA) followed by Duncan Test (Duncan; 1955) using statistical Analysis System (SAS. 2012).

Results and discussion

Results from Table 2 showed no significant differences ($P \leq 0.05$) in the live body weight between all treatments throughout 1- 4 weeks of age, but treatment T1 and T3 recorded the lowest live body weight at the age of 5 weeks.

Table 3 indicates there were no significant variations for body weight gain between treatments in weeks 2, 3, 4. But in the fifth week and the whole experimental period T1 and T4 had the least body weight gain.

From Table 4 we can notice no significant differences between experimental treatments for feed consumption at the age of 2 weeks. T6 and T3 recorded the highest feed consumption at 4, 5 weeks of age and for the period from 2-5 weeks.

Feed conversion results from table 5 showed that the control treatment had numerically the highest value of feed conversion in all the periods of the experiment, T6 and T 4 the best feed conversion values throughout the experiment.

No significant differences were recorded in the results of carcass cuts percentage weight and dressing percent from table 6.

The results of the present experiment agrees with those of Mehala (2008) who didn't found any significant differences in live body weight by adding different levels of turmeric at the first weeks of age and also agrees with Al-Sultan (2003) who recorded a an increased final live body weight when adding turmeric at level of 0.5%. Broilers fed both Piper cubeba levels had significantly higher live body weight compared to control treatment due to the activation of nutrient absorption by simply} the photogenic chemical substances (Amad *et al.*, 2011), and this effect is very obvious in T6 results which have the double impact from the tow herbs.

The significantly low weight gain result for T2 in the whole experiment might be due to the low level of

Table 2: Impact of cubeb (*Piper cubeba*) an turmeric dietary inclusion on broilers on live body weight.

Weeks / Treatment	1	2	3	4	5
T1	6.2±157	12.0±385	6.2±760	6.20±1227	b3.25±1870
T2	1.5±172	12.3±409	7.5±800	7.50±1270	b4.20±1880
T3	4.2±159	8.9±389	8.20±742	8.30±1255	a3.12±1979
T4	5.2±169	19.3±400	9.9±762	9.30±1230	a2.90±1970
T5	2.5±175	13.3±400	9.5±810	6.50±1269	a4.20±1976
T6	3.2±174	7.9±391	5.20±794	6.30±1274	a2.12±2018
significance	NS	NS	NS	NS	*

Table 3: Impact of cubeb (*Piper cubeba*) an turmeric dietary inclusion on broilers on body weight gain

Weeks / Treatment	2	3	4	5	5-2 Weeks
T1	12.9±228	9.7±375	12.3±467	b4.20±643	b8.9±1713
T2	7.4±237	6.2±391	20.2±470	b5.35±630	b7.2±1718
T3	5.9±230	12.3±353	8.3±513	a3.90±765	a6.5±1861
T4	8.3±231	5.3±362	9.2±468	a5.20±770	a8.1±1831
T5	5.4±232	5.2±389	21.2±472	a5.35±710	a6.2±1800
T6	4.9±229	10.3±350	7.3±515	a3.19±763	a5.5±1863
significance	NS	NS	NS	*	*

Table 4: Impact of cubeb (*Piper cubeba*) an turmeric dietary inclusion on broilers on feed consumption.

Weeks Treatment	2	3	4	5	5-2 Weeks
T1	15.3±385	b8.2±525	b6.2±785	b8.3±1260	b13.2±3070
T2	12.2±359	b8.9±525	b7.3±770	c9.8±1137	c3.20±2791
T3	9.9±398	b8.1±631	a6.9±827	a9.6±1306	a11.5±3162
T4	10.3±355	b8.3±558	b6.4±782	b5.30±1225	d8.60±2920
T5	11.2±350	b7.9±519	b7.3±766	c9.0±1133	c3.02±2789
T6	9.9±391	a8.1±629	a6.9±818	a9.6±1300	a11.5±3159
significance	NS	*	*	*	*

Table 5: Impact of cubeb (*Piper cubeba*) an turmeric dietary inclusion on broilers on feed conversion.

Weeks Treatment	2	3	4	5	5-2 Weeks
T1	a0.09±1.69	a0.07±1.76	a0.05±1.93	a0.06±2.11	a0.09±1.78
T2	b0.07±1.51	a0.03±1.77	b0.04±1.64	b0.09±1.60	a0.08±1.72
T3	a0.16±1.73	b0.04±1.68	b0.09±1.61	b0.04±1.70	b0.08±1.53
T4	b0.12±1.54	c0.08±1.44	b0.12±1.67	b0.03±1.82	b0.04±1.54
T5	b0.12±1.72	b0.02±1.59	b0.08±1.60	b0.03±1.71	b0.07±1.51
T6	c0.11±1.53	c0.07±1.45	b0.11±1.66	b0.02±1.83	b0.04±1.53
significance	*	*	*	*	*

turmeric, all the other experimental diets were better than the control treatment. This result agrees with Durrani *et al.,* (2006) and Al-Sultan (2003) and Murugesan *et al.,* (2015).

The feed consumption results didn't agree with the findings of Durrani *et al.,* (2006) who recorded a decreased feed consumption by the dietary inclusion of turmeric, but it agrees with the results of Durrani *et al.,* (2007). It also in disagreement with AnLaurentiz *et al.,* (2015) and Sadeghi Cardoso *et al.,* (2012) who found no variance in feed intake in black pepper fed broiler.

This might explain the enhancement increase in feed intake of groups given diet supplemented with cubeb as reported by Al-Harthi, (2006), who found that broiler chicks fed diets supplemented with hot spice

demonstrated improved feed conversion (Al-Harithi, 2008; El-Husseiny, 2008). Typically the rise in feed consumption throughout the period may be involving the stimulant, antiseptic and even digestive power of capsaicin and increasing birds' threshold with increasing age associated. (Chevallier, 1996) with broilers

It also decrease material transfer speed and increase digestive enzymes impact and enhanced broilers weighs gain. Al-Kassie *et al.,* (al. 2011a) and Al-Kassie *et al.,* (2011b) al., 2011b] recorded that the level of pepper used reveal the high action of Piperazine citrate incorporated in the broilers feed which may affect the transit of digestive juices through the stomach (Laurentiz (An et (2007 *et al.,* 2015).

Many studies proved that there is an increment in live body weight and feed conversion and improvement feed intake with use of pepper (Cardoso *et al.,* 2012., Al-Kassie *et al.,* 2011 a., Kassie *et al.,* (2011b)., Yam *et al.,* (2008), Rajput *et al.,* 2012). [7, 8, 9, 10].

The dressing percent and carcass cuts percentage weight results didn't agree with the results of Mehala *et al.,* (2008) who reported that birds fed with 0.2 percent turmeric had highest dressing percent and Durrani et al. (2006) 5 who found that broilers given 0.50 percent turmeric had higher dressing percent compared to control diets. The mutual impact of cubeb and turmeric was very influential in this study showing a profound effects on the studied traits.

Resent literatures imply that turmeric and cubeb can be a beneficial opportunity to antibiotics in poultry industry because of its wide safe margin and its efficacies to promote performance. The enhancement in growth is probably attributed to digestive system, immune system, and nutrient utilization. But, so far little work has been achieved to signify its mode of action in poultry. Consequently, to optimize the efficacy of turmeric and cubeb in bird's diets, dose of supplementation, as well as the period of supplementation.

Table 6: Impact of cubeb (Piper cubeba) an turmeric dietary inclusion on broilers on percentage weight of carcass cut and dressing percent.

Weeks Treatment	%breast	%thighs	%wings	%back	%nick	Dressing percent %
T1	2.1±32.40	4.20±31.6	0.20±9.4	1.20±20.5	0.20±5.20	0.34±68.9
T2	3.10±32.80	3.20±30.78	0.30±9.0	1.40±21.2	0.15±6.18	0.19±70.0
T3	2.20±33.10	2.20±29.78	0.25±9.1	2.20±20.70	1.20±6.33	0.20±70.3
T4	3.20±32.30	2.25±31.0	0.21±8.9	1.80±21.80	0.35±6.10	0.25±69.1
T5	3.10±32.70	3.20±30.68	0.30±9.1	1.20±20.2	0.14±6.17	0.17±70.2
T6	2.20±33.00	2.20±29.77	0.26±9.2	2.10±20.5	1.10±6.23	0.18±70.4
significance	NS	NS	NS	NS	NS	NS

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