



Using of Two Types of Powder Tea in Quail Diets with Probiotic to growth performance and Carcass Traits

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Abstract: A total of 210 unsexed quails aged 10 days used to determine the effect of two types of tea powder in quail diets with probiotic to production and carcass traits, divided to 6 treatments in CRD design, with 7 replicates and 5 birds per replication. The six diets were: T1= control, T2= adding 0.1 % probiotic, T3= adding 2% green tea powder, T4= adding 2% black tea powder, T5= T3 + 0.1 % probiotic finally T6= T4 + 0.1 % probiotic. The results of statistical analysis showing increased significantly of body weight gain in T5 compared with T1, while feed intake was reduced significantly in T3, T4 and T6 compared with T1. conversion ratio of feed, protein, energy, methionine and lysine for all treatments were significantly better than control treatment, while no significant increase was shown in carcass traits among all treatments.

Key Words: tea, quail, probiotic, production traits, carcass traits.

Introduction:

Phytogens, also known as phytobiotics or botanicals (spices and herbs), are generally defined as compounds derived from plants. [1-4]. They incorporated into diets to improve performance of poultry and quality of feed derived from these animals. [5,6]. There are four primary types of tea (camellia sinensis L.), black tea: leaves of tea exposed to air and fully oxidized or fermented, turning the leaves from green to black, oolong tea: if in the middle of The tea is black and green tea, with green tea being the least processed and unfermented, and white tea being the most processed and fermented: least processed of all teas [7,8]. The botanical properties of green or black tea (camellia sinensis) are interesting because of their high content of pharmacologically active substances such as catechins, flavanols, flavadiols, flavonoids and phenolic acids. [3,9]. In addition, smaller ingredients such as caffeine, theophylline and gallic acid are also included. [10]. The green tea or black tea leaves can be offered as an ingredient or as a supplement to the diet to enhancement laying hens performance [11,12] and for reducing the mortality [13]. Catechins have a wide range of biological effect including antioxidative activity [9], anti mutagenic effect [14], anti-hyper cholesterol lemia [15], anti-hyper glycemia [16], antibiotic action [17] and antimicrobial and hypolipidemic effect [18]. [19] showed that the growth rates of the green tea (GT) supplemented diet groups were significantly better than the no-supplemented control group, and that food consumption was higher than the control group. [3] used two levels of green tea (1.5 and 3.0 g/kg diet) for broiler nutrition, GT supplementation (1.5 g/kg diet) increased growth rate at 45 d of age and improved FCR

by 10.40 %. Results showed the average broiler weight 42 days old were 1862 and 1698 gm and the feed conversion ratio were 2.033 and 2.186 for the birds received diet with or without supplemented 2ml of black tea extract [2], while no significant difference in feed intake and feed efficiency among treatments (0.5 , 1.00 and 2 %) levels of green tea for broiler diets without antibiotics [20]. In contrast to the above studies, [21] observed significantly increased weight gain in broilers (1210.61 g/bird) during the finisher period at the level 0.5 % compared to the 1.0 % level (1033.36 g/bird) of the green tea. [22] reported that 1.00 % , 2.50 % and 5.00 % of green tea in broiler diet linearly reduced body weight gain of the chicks. Probiotics as alternative feed additives to antibiotic growth promoters [23-25].

Material and Methods

A total of 210 local quail ten days old housed in a semi close ventilated battery – quail house. The birds assigned to six treatments with seven replications (cages of battery) having five birds in each using CRD design. There were six dietary treatments;

- 1: control (basal diet without GTP, BTP and probiotic).
- 2: basal diet with 0.1 % probiotic.
- 3: basal diet with 2 % green tea powder (GTP).
- 4: basal diet with 2 % black tea powder (BTP).
- 5: basal diet with 2 % green tea powder (GTP) + 0.1 % probiotic.
- 6: basal diet with 2 % black tea powder (BTP) + 0.1 % probiotic.

Table 1. The composition of typical tea beverage %/wt/wt solids [7]

Table 1. The composition of typical tea beverage %/wt/wt solids [7]

Components	Green tea	Black tea
Catechins	30%	9%
Theaflavins	—	4%
Simple polyphenols	2%	3%
Flavonols	2%	1%
Other polyphenols	6%	23%
Theanine	3%	3%
Aminoacids	3%	3%
PeptidedProtein	6%	6%
Organic acids	2%	2%
Sugars	7%	7%
Other carbohydrates	4%	4%
Lipids	3%	3%
Caffeine	3%	3%
Other methylxanthines	<1%	<1%
Potassium	5%	5%
Other mineraldash	5%	5%
Aroma	Trace	Trace

The feed ingredients of the dietary treatments are shown in the table 2. Growth performance of quail during the experiment (10-45 days) were evaluated body weight, weight gain, feed intake, conversion ratio of feed, energy, protein, methionine and lysine. At 45 d of age, the slaughtered birds were employed for measurement of carcass yield and components, weights and percentages of eviscerated carcass, giblets (heart and liver), breast, thigh and drumstick and back, wings,

proventricul gastric and small intestine. Differences among treatments means were analyzed using Duncan's multiple range test [26] with SAS program [27].

Table 2. The chemical composition of the dietary treatments

Treatments	T1	T2	T3	T4	T5	T6
Feed stuff (%)						
Wheat	59	58.90	55.61	55.61	55.51	55.51
Soybean (48% cp)	28.47	28.47	29.06	29.06	29.06	29.06
protein concentrate	10	10	10	10	10	10
Sunflower oil	2	2	2.8	2.8	2.8	2.8
Ground green tea	----	----	2	----	2	----
Ground black tea	----	----	----	2	----	2
Probiotic	----	0.1	----	----	0.1	0.1
Vitamin-mineral premix	0.1	0.1	0.1	0.1	0.1	0.1
Choline chloride (60%)	0.32	0.32	0.32	0.32	0.32	0.32
Salt (Nacl)	0.2	0.2	0.2	0.2	0.2	0.2
TOTAL (%)	100	100	100	100	100	100
Chemical calculated analysis*						
Metabolism Energy (kcal/kg feed)	2902	2900	2885	2885	2880	2880
Crude protein (%)	25.33	25.32	25	25	25	25
Methionine (%)	0.67	0.67	0.66	0.66	0.66	0.66
Lysine (%)	1.36	1.36	1.37	1.37	1.37	1.37
Calcium (%)	0.56	0.56	0.56	0.56	0.56	0.56
Available phosphorus (%)	0.465	0.465	0.465	0.465	0.465	0.465

* According to [28]

Results and Discussion

Table 3 shows feed intake, body weight gain and feed conversion ratio of grower quails. feed intake of the third group birds (basal diet contained 2 % green tea powder) and birds of the fifth group (basal diet contained 2 % green tea powder with 0.1 % probiotic) feed significantly less than control group birds, while consuming basal diet containing 2 % green tea powder + 0.1 % probiotic birds (T5) were significantly ($p \leq 0.05$) higher than control group birds as percentage 22.41 %. On other hand the ability of birds of the basal diet contained supplemented with 0.1 % probiotic (T2) or basal diet contained green tea powder or black tea powder with or without probiotic supplementation (T3, T4, T5 and T6) were had significantly ($p \leq 0.05$) better average of feed conversion ratio by comparing with control group birds (T1).

Table 4 shows significantly ($p \leq 0.05$) better ability the bird of the T2, T3, T4, T5 and T6 than birds of the control group in the conversion ratio of energy, protein, methionine and lysine to weight gain. Dressing percentage of the control group were significantly lowest than the average of this trail for the T2, T3, T4 and T6. The enhancement of the traits by using 2 % green tea powder or 2 % black tea powder with or without providing those diets 0.1 % probiotics because the useful mode action of probiotic in the diet [29]. On the other hand, the mode action of the compounds in the green or black tea powder led to improve significantly the quail performance [2,3,30,31]. [32] indicated that the importance of microorganisms used in probiotic is highlighted by their ability to inhibit intestinal bacteria by competing with pathological microorganisms in occupying receptor sites on the epithelial cells lining the gastrointestinal tract and thus facilitating their excretion and excretion with waste to the outside of the body, and this is one of the mechanisms of competitive exclusion. It also creates of volatile fatty acids such as Propionic and Butyric by Bifidobacterium which works to raise pH to 6.6,

which is important to Inhibiting the growth and killing of bacteria belonging to the enterobacteria, such as Salmonella and finally improves the productive performance of birds. Carcass yield as dressing percentage (%) at 45 d of age are summarized in the table 5. Dressing percentage (%) tended to be significantly ($p \leq 0.05$) lower in the control fed group (T1) when compared to 2, 3, 4 and 6 group (T2, T3, T4, and T6). Breast (%), Thigh (%), Back (%) were not significantly influenced by GTP and BTP supplementation with or without probiotic adding to the dietary treatment. Components of the edible and un edible of the internal organs of the birds at 45 d age are shown in table 6, The dietary 2% GTP (T3) significantly ($p \leq 0.05$) reduced Proventriculus (%) and gizzard (%) values than the control treatment (T1). No significant difference observed in the values of the small intestine (%), liver (%), heart (%) and pancreas (%) among the dietary treatments. No significant difference in the breast meat (%) and drumstick meat (%) observed by GTP feeding while the thigh meat (%) and wing meat values were significantly ($p \leq 0.05$) higher for birds fed the control diet when compared that with GTP feed groups.

Table 3. Using of two types of tea in quail diets with probiotic upon growth performance of quail (SE \pm mean)

Traits Treatment	Feed conversion ratio (g feed/g WG)	Feed intake (g/bird/day)	Weight gain (g/bird/day)
T1	0.20 \pm 5.77 A	0.80 \pm 27.21 a	0.13 \pm 4.73 b
T2	0.15 \pm 4.83 B	0.67 \pm 25.77 abc	0.29 \pm 5.38 ab
T3	0.24 \pm 4.41 B	0.67 \pm 24.29 c	0.32 \pm 5.59 ab
T4	0.25 \pm 4.77 B	0.95 \pm 24.61 bc	0.26 \pm 5.21 ab
T5	0.31 \pm 4.37 B	0.16 \pm 24.27 c	0.57 \pm 5.79 a
T6	0.18 \pm 4.74 B	0.63 \pm 26.52 ab	0.10 \pm 5.61 ab

- same letters means not significantly different with treatments at 5% level.
- different letters means a significantly different with treatments at 5% level.

T1= Control

T2= Control + probiotic 0.1 %

T3= Control + green tea 2 %

T4= Control + black tea 2 %

T5= Control + probiotic 0.1 % + green tea 2 %

T6= Control + probiotic 0.1 % + black tea 2 %

Table 4. Using of two types of tea in quail diets with probiotic upon intake and conversion ratio of Energy, protein, methionine and lysine for quail (SE ± mean)

Traits	Energy intake (Kcal/bird/day)	Energy conversion ratio (Kcal /g GW)	Protein intake (g/bird/day)	Protein conversion ratio (g protein/g GW)	Methionine intake (mg/bird/day)	Methionine conversion ratio (mg meth./g GW)	Lysine intake (mg/bird/day)	Lysine conversion ratio (mg lys./g GW)
T1	2.34 ± 78.97 a	0.60 ± 16.74 a	0.20 ± 6.89 A	0.05 ± 1.46 a	5.40 ± 182.32 a	1.39 ± 38.66 a	10.97 ± 370.09 a	2.83 ± 78.48 a
T2	1.97 ± 74.73 abc	0.45 ± 14.01 b	0.17 ± 6.52 Abc	0.04 ± 1.22 b	4.55 ± 172.66 abc	1.06 ± 32.37 b	9.24 ± 350.48 abc	2.15 ± 65.71 b
T3	1.95 ± 70.08 c	0.71 ± 12.73 b	0.16 ± 6.07 C	0.06 ± 1.10 b	4.55 ± 162.76 c	1.65 ± 29.56 b	9.30 ± 332.81 c	3.38 ± 60.45 b
T4	2.75 ± 71.01 bc	0.74 ± 13.78 b	0.23 ± 6.15 Bc	0.06 ± 1.19 b	6.40 ± 164.92 bc	1.73 ± 32.00 b	13.08 ± 337.24 bc	3.54 ± 65.44 b
T5	0.47 ± 69.92 c	0.91 ± 12.59 b	0.04 ± 6.06 C	0.07 ± 1.09 b	1.11 ± 162.66 c	2.13 ± 29.31 b	2.27 ± 332.62 c	4.37 ± 59.93 b
T6	1.83 ± 76.38 ab	0.54 ± 13.65 b	0.15 ± 6.63 Ab	0.04 ± 1.18 b	4.26 ± 177.69 ab	1.25 ± 31.77 b	8.71 ± 363.36 ab	2.57 ± 64.97 b

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T4= Control + black tea 2 %

T5= Control + probiotic 0.1 % + green tea 2 %

T6= Control + probiotic 0.1 % + black tea 2 %

Table 5. Using of two types of tea in quail diets with probiotic upon dressing (%) and carcass parts (%) of quail (SE ± mean)

Traits	Live body weight (g)	Dressing percentage (%)	Breast (%)	Thigh (%)	Back (%)	Wings (%)
T1	± 185.83 8.04 a	2.77 ± 68.40 b	± 38.48 0.94 a	± 22.09 0.57 a	± 26.26 1.23 a	± 8.76 0.27 a
T2	± 177.86 9.18 a	0.75 ± 71.50 a	± 37.61 1.05 a	± 22.18 0.50 a	± 26.16 0.96 a	± 8.60 0.19 a
T3	± 184.29 7.97 a	0.62 ± 71.73 a	± 38.75 0.62 a	± 21.93 0.39 a	± 26.95 0.71 a	± 8.40 0.23 a
T4	± 179.29 6.93 a	0.80 ± 70.38 ab	± 37.86 1.03 a	± 20.94 0.45 a	± 27.08 1.05 a	± 8.66 0.35 a
T5	± 177.86 10.62 a	0.71 ± 70.65 a	± 37.37 1.27 a	± 21.53 0.46 a	± 28.13 1.35 a	± 8.41 0.12 a

T6	± 183.57	0.94 ± 71.55	± 38.45	± 22.23	± 26.73	± 8.38
	10.78	a	0.67	0.34	0.69	0.17
	a		a	a	a	a

- same letters means not significantly different with treatments at 5% level.
- different letters means a significantly different with treatments at 5% level.

T1 Control

=

T2 Control + probiotic 0.1 %

=

T3 Control + green tea 2 %

=

T4 Control + black tea 2 %

=

T5 Control + probiotic 0.1 % + green tea 2 %

=

T6 Control + probiotic 0.1 % + black tea 2 %

=

Table 6. Using of two types of tea in quail diets with probiotic upon internal organs weight (%) of quail (SE \pm mean).

Traits	Proventriculus (%)	Gizzard (%)	Small intestine (%)	Liver (%)	Heart (%)	Pancreas (%)
T1	0.08 ± 0.528 a	0.14 ± 2.774 a	0.35 ± 3.401 a	0.41 ± 3.270 a	0.09 ± 1.319 a	0.04 ± 0.317 a
T2	0.02 ± 0.497 ab	0.11 ± 2.277 bc	0.27 ± 3.200 a	0.24 ± 2.721 a	0.07 ± 1.213 a	0.04 ± 0.307 a
T3	0.02 ± 0.394 b	0.08 ± 2.204 c	0.15 ± 3.106 a	0.11 ± 2.584 a	0.03 ± 1.202 a	0.01 ± 0.223 a
T4	0.01 ± 0.437 ab	0.16 ± 2.642 ab	0.19 ± 3.403 a	0.14 ± 3.068 a	0.03 ± 1.162 a	0.02 ± 0.235 a
T5	0.02 ± 0.413 ab	0.10 ± 2.293 bc	0.10 ± 2.718 a	0.11 ± 2.660 a	0.05 ± 1.196 a	0.03 ± 0.249 a
T6	0.02 ± 0.457 ab	0.17 ± 2.463 abc	0.29 ± 2.948 a	0.14 ± 2.572 a	0.04 ± 1.152 a	0.03 ± 0.233 a

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T3= Control + green tea 2 %

T4= Control + black tea 2 %

T5= Control + probiotic 0.1 % + green tea 2 %

T6= Control + probiotic 0.1 % + black tea 2 %

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