



## The effect of ginger powder on performance, carcass characteristics and blood parameters of broilers

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### ABSTRACT

To study the effect of herb ginger powder on performance, carcass characteristics and blood parameters of broilers used from 192 broiler chicks (Ross ) in a completely randomized design with 4 treatments and 4 replicates ( each replicate of 12 chicks ). All treatments, including different levels of ginger powder ratios of 0, 0.5, 1, 1.5 percent respectively called T1, 2T, T3 and T4 that were added to the basal diet for 42 days. The results showed that increasing levels of dietary herb ginger powder caused a significant reduction in food intake and weight gain in broilers. So that the entire period, birds fed diets containing 1% lower feed intake and diet ginger powder 0.5% of total period of greatest weight gain were regarded ginger powder. Best and worst feed conversion was significantly related to treatment with 1% ginger and control group. Rise to the level of the herb ginger powder 1.5 percent, decrease abdominal fat in broiler chickens will increase the percentage of ham and stock, while on other carcass parameters were not significantly affected. The results showed that the blood parameters of glucose, HDL and LDL levels treated 1.5 percent ginger powder showed no significant difference compared to control. And other parameters such as cholesterol and triglycerides in number (in treatments 1 and 1.5 percent) powdered ginger to the control group showed a tangible decrease was not significant. From this experiment we can conclude that treatment with 1% (T3) and 1.5 percent (T4) ginger powder showed better performance and carcass characteristics and blood parameters in broilers.

**Keywords:** Ginger, chicken, performance, blood parameters

### Introduction

A large variety of food additives in feed for broiler chickens used to improve performance. Spice as an additive in the diet of chickens is very common. Active principles of the plant or plant chemicals present in certain parts of the plant or the effect of therapeutic activity that accompanies them (Zhang et al, 2009). Spices and herbs can have many benefits for the health of broilers and functions such as anti-oxidation ability (hui , 1996) , antimicrobial activity ( Dorman and Weis , 2000 ) , enhance digestion by stimulating endogenous enzymes to the ( Brugalli , 2003). Ginger is widely used in many countries as a food spice and as an herbal remedy used. (Chrubasik et al, 2005). Important compound in ginger, gingerol,

gingerdiol and ginerdione the ability to stimulate the digestive enzymes, the impact on microbial activity (Dieumou et al, 2009) in broiler. Reported that various medical properties of ginger (such as showing pain) analgesic, antiemetic, antiulcer (febrifuge) antipyretic and Cardiac relaxing. (Mascolo et al, 1989; Philips et al, 1993; Jana et al, 1999) and reduced anti oxidation free harm, increased reuse and improve the health and production of animals (Bosisio et al, 1992).

## Materials and Methods

192 broiler chicks (Ross) were trained for six weeks. The 4 treatments and 4 replicates (12 chicks per replicate) were drivers. The experiments were studied in a period of 42 days to evaluate the performance and carcass characteristics, and blood parameters. This scheme is based on corn and soybean meal, and minerals and vitamins for 2 periods with the period 0 to 21 days 21 to 42 days. Ginger powder was purchased from the local market and was used for treatment. Treatment 1 : control ( no additives) , Treatment 2 with 0.5% Of ginger and treatments 3: 1 percent of ginger and treatment 4 : 1.5 percent ginger powder was added to the experimental diets . At the end of the experiment , one bird from each replicate were randomly removed for slaughter , blood samples were collected and centrifuged for 10 min in the machine , to separate the serum separation . Serum samples for analysis of glucose in minus twenty degrees Celsius (Coles, 1986), cholesterol, triglycerides and HDL, LDL (Franey et al, 1986) were housed. All data were used from the CRD (completely randomized design) (1992, SAS) to analyze multiple range and Duncan's tests to compare treatment means (Duncan, 1955).

## Results and discussion

All chickens were apparently healthy and mortality was not significant in the whole course of the experiment. According to Table 1, the effect of treatment with 1% ginger powder on broiler feed intake during the second week showed significant difference compared to control. And sixth week of treatment, 0.5% highest intake of ginger powder and ginger powder 1% treatments showed the lowest intake. But the whole period of treatment with 1% ginger powder showed the lowest feed intake was not significant. The effect of ginger powder (Table 2), the weight gains per week in the third and fifth, respectively, in treatments 1% and 1.5% showed no significant difference with the control diet. And the total duration of weight gains, but did not show significant differences but in numerical treated with 0.5 % of ginger powder showed the best weight gain. The effect of treatment with 1% ginger powder (Table 3) on feed conversion in the, second and third week period showed a significant difference compared to control. Ginger powder 1 % of total treatment period showed the best feed conversion ratio and the lowest. According to (Table 4), the effect of treatment 1.5% of powdered ginger on the percentage of abdominal fat and thigh meat stock showed a significant difference compared to control .

In stock and percentage ham, treatment 1.5 percent ginger powder has the most and the least amount of control treatment, but the treatment of abdominal fat 1.5% of powdered ginger has been minimal. Also treated 1.5 percent ginger powder weight control treatment for breast, gizzard and liver more than treatments the herb ginger powder, but did not show significant differences. The results showed that glucose, HDL and LDL levels treated 1.5% ginger powder (Table 5) showed significant difference compared to control. In other blood parameters no differed significantly between the control group and the treatment plant. But cholesterol and triglyceride levels in treatments 1% and 1.5% of powdered ginger in numerical compared to the control group demonstrated a tangible decrease that were not significant.

Table 1 - Effect of different levels of ginger powder on feed intake of broiler chickens at different weeks of reared (g)

Term	Levels of ginger powder (percent)				SEM	P- Value
	0	0.5	1	1.5		
First week	94.64	94.64	82.50	92.85	4.86	0.28
Second week	370.00 <sup>a</sup>	325.00 <sup>ab</sup>	299.64 <sup>b</sup>	353.16 <sup>a</sup>	14.37	0.02
Third week	533.61	537.14	519.77	526.70	28.19	0.97
Fourth week	727.64	753.9	737.23	752.26	32.62	0.93
Fifth week	850.36	927.14	929.81	964.17	37.62	0.23
Sixth week	819.43	891.36	732.11	817.08	41.51	0.11
Total	3395.68	3529.18	3301.05	3506.22	122.82	0.54

Table 2 - Effect of different levels of ginger on weight gain of broiler chickens at different weeks of reared (g)

Term	Levels of ginger powder (percent)				SEM	P- Value
	0	0.5	1	1.5		
First week	70.71	79.82	76.79	80.71	4.35	0.39
Second week	155	178.57	192.61	171.55	14.91	0.38
Third week	262.32	301.07	303.79	291.55	12.48	0.13
Fourth week	378.75	381.43	380.33	405.78	23.18	0.82
Fifth week	357.00 <sup>c</sup>	414.82 <sup>bc</sup>	431.63 <sup>ab</sup>	459.96 <sup>a</sup>	13.28	0.05
Sixth week	411.78	376.25	321.25	280.53	53.22	0.13
Total	1663.75	1731.96	1706.45	1690.07	62.16	0.88

The standard error of the mean SEM and P-Value is the level of significance. Dissimilar letters in each row is indicated significant (P<0.05).

Table 3 - Effect of different levels of ginger powder on a FCR of broiler chickens at different weeks of reared

Term	Levels of ginger powder (percent)				SEM	P- Value
	0	0.5	1	1.5		
First week	1.34	1.19	1.09	1.16	0.065	0.10
Second week	2.41 <sup>a</sup>	1.84 <sup>bc</sup>	1.63 <sup>c</sup>	2.06 <sup>ab</sup>	0.129	0.007
Third week	2.05 <sup>a</sup>	1.78 <sup>b</sup>	1.71 <sup>b</sup>	1.80 <sup>b</sup>	0.067	0.018
Fourth week	1.93	1.99	1.95	1.86	0.070	0.658
Fifth week	2.27	2.24	2.16	2.09	0.088	0.512
Sixth week	2.23	2.39	2.35	2.94	0.278	0.326
Total	2.04	1.90	1.82	1.99	0.04	0.01

The standard error of the mean SEM and P-Value is the level of significance. Dissimilar letters in each row is indicated significant ( $P < 0.05$ ).

Table 4 - Effect of different levels of ginger powder on carcass characteristics of broiler chickens at 42 days of age (% of live weight)

Carcass components	Levels of ginger powder (percent)				SEM	P- Value
	0	0.5	1	1.5		
Thigh	20.07 <sup>b</sup>	20.67 <sup>b</sup>	19.59 <sup>b</sup>	23.49 <sup>a</sup>	0.862	0.032
Breast	29.28	32.55	32.87	31.43	1.452	0.335
Liver	3.62	3.45	3.02	3.12	0.333	0.565
Gizzard	3.52	3.17	2.84	3.59	0.395	0.533
Abdominal Fat	2.54 <sup>a</sup>	3.06 <sup>a</sup>	2.25 <sup>ab</sup>	1.38 <sup>b</sup>	0.348	0.032
Spleen	0.18	0.17	0.17	0.21	0.018	0.426

The standard error of the mean SEM and P-Value is the level of significance. Dissimilar letters in each row is indicated significant ( $P < 0.05$ ).

Table 5 - Effect of different levels of ginger on blood parameters of broilers at 42 days (measured in milligrams per deciliter)

blood parameters	Levels of ginger powder (percent)				SEM	P- Value
	0	0.5	1	1.5		
Glucose	237.5 <sup>ab</sup>	260.75 <sup>a</sup>	224.25 <sup>bc</sup>	217.50 <sup>c</sup>	0.125	0.02
Triglycerides	52.25	54.25	48.25	51.00	0.98	0.96
Cholesterol	148.75	152.00	136.75	135.00	0.65	0.09
HDL	64.25 <sup>b</sup>	78.75 <sup>ab</sup>	77.00 <sup>b</sup>	92.75 <sup>a</sup>	0.60	0.01
LDL	45.5 <sup>ab</sup>	49.25 <sup>a</sup>	44.75 <sup>bc</sup>	41.00 <sup>b</sup>	0.169	0.007

The standard error of the mean SEM and P-Value is the level of significance. Dissimilar letters in each row is indicated significant ( $P < 0.05$ ).

## Conclusion

The effect of treatment with 1% ginger powder on broiler feed intake during the second week showed significant difference compared to control. And week sixth of treatment, 0.5% highest intake of ginger powder and ginger powder 1% treatments showed the lowest intake. But the whole, period of treatment with 1% ginger powder showed the lowest feed intake and was not significant. The results obtained in this study corresponded with the results of Zhang et al (2009) using ginger (0.5%) and Dieumou et al (2009) using essential oils of ginger (10,20 and 40 mg per day) on broilers.

In the other study, Cabuk et al (2006) reported that adding a mixture of medicinal plant extracts on broiler feed intake was reduced significantly compared to the control group. The effect of ginger powder on weight gain in the fifth weeks, , in treatments 1.5% showed significant difference with the control diet. Corresponded with the Arkan et al (2012) reported that the levels of ginger diet improve performance, weight gain and reduce cholesterol, triglyceride (TG) and glucose. Herawati (2009) reported that chickens fed red ginger to which was added 2%, more body weight was observed than chicks that had a diet uncontrolled. Dieumou et al (2009) reported that the amount of dried ginger powder (8.4, 37, 74, 149, 300) mg cause increase weight gain, increased activity of superoxide, Glutathione peroxides and protein and reduced Molondyaldy concentration and cholesterol. In experiment (Mehala, 2008), reported that adding aloe vera and turmeric in broiler feed had no significant effect on weight gain. The effect of treatment on feed conversion ginger powder 1% per week of the second and third period showed a significant difference compared to control. Ginger powder 1% of total treatment period showed the best feed conversion ratio so was the lowest. In study, Durrani et al, (2006) with turmeric and Aloro among treatments reported significant conversion factor. Kamel (2001), reported that the conversion ratio improved by adding plant extracts. In study Mehala et al (2008), reported that adding turmeric and Aloro saw significant effect on FCR. The effect of treatment, 1.5% of powdered ginger on the percentage of abdominal fat and thigh meat stock showed a significant difference compared to control. In stock and percentage ham-treated 1.5 percent ginger powder has the most and the least amount of control treatment, but the treatment of abdominal fat 1.5% of powdered ginger has been minimal. Also treated 1.5 percent ginger powder weight control treatment for breast, gizzard and liver more than control group, the herb ginger powder, but did not show significant differences. In study, Emadi et al (2006), reported that adding 0.5 percentage of turmeric root powder to the diet caused a significant decrease in the relative weight of abdominal fat. We disagree with the trial and the trial Mehala et al(2008), adding aloe Vera to the feed of broilers reported that treatments did not affect the composition of the carcass components including abdominal fat. The results showed that glucose, HDL and LDL levels treated 1.5 percent ginger powder showed significant difference compared to control. In other blood parameters differed the control group. But cholesterol and triglyceride levels in treatments 1% and 1.5% of powdered ginger in number compared to the control group demonstrated a tangible so, decrease were not significant. In the study Craige et al (2001), the role of herbs and oils extracted from them in reducing cholesterol and protect against cancers reported. There is also evidence that the volatile oils extracted serum cholesterol in broilers fed diets was reduced (Case et al, 1995). In a study Emadi and Kermanshahi (2006) Effect of turmeric rhizome powder (0.05, 0.1, 0.15 and 0.2%) on some blood parameters of laying hens a diet based on wheat and soybean were investigated. According to the results of tests of different levels of turmeric rhizome powder caused a significant decrease in blood LDL and cholesterol. It also increases HDL levels that are consistent with the results of the present study. Zhang et al (2009) in a study showed that using the 0.5% powdered ginger rhizome significantly decreased total cholesterol in broilers that are not consistent with these results. Omage et al (2007) in a study the effect of scrap substitute powdered ginger as an energy source in the diet of a rabbit. Treatments consisted of four levels of 8-week experimental period of 10, 20, 30, and 40 percent ginger and a control group without ginger. The use of ginger significantly decreased total cholesterol and total lipid levels in all treatments compared with the control group, which does not correspond with the results obtained in this study.

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