

CARCASS CHARACTERISTICS OF BROILER CHICKENS FED GINGER, GARLIC AND MIXTURE OF GINGER AND GARLIC POWDER

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ABSTRACT

This study was conducted to examine the effect of ginger and garlic meal on the carcass characteristics of the broiler chicken. The carcass characteristics of broiler chickens fed ginger, garlic and mixture of ginger and garlic powder was done at the end of the feeding trial. The one hundred and eighty (180) day-old broiler chicks was purchased from a reputable hatchery in South/West, Nigeria were used in the experiment. A total of 16 chickens was harvest, 4 from each 4 treatment were used for the experiment. The design of the experiments was completely randomized design (CRD). With T₁ as the control, T₂ Ginger, T₃ Garlic and T₄ Combination of Ginger and Garlic. Most of the carcass characteristics were in favour ($p < 0.05$) of broilers fed T₄ but closely followed by broilers fed T₃ and T₂. It is therefore recommended that T₄ mixture of ginger and garlic powder could be included in their diet at 1:1 when combined, should be used for feeding broilers for good carcass yield) among others, to enhance the carcass characteristics of broiler chicken.

Key words: Carcass, Broiler, Characteristics, Ginger and Garlic

INTRODUCTION

A man's health is majorly a reflection of what he/she eats which is summarized as lifestyle, since it has been noted that the use of antibiotic in broiler production has serious health implication because of their residual effects. To have a healthier broiler chicken, it is inevitable according to researchers that the use of phytobiotics in broiler chicken production is one of the sure means of achieving one's goal. Poultry meat like broilers is largely consumed because its meat is rich in protein; it has low fat content fortified with vitamins including iron (Akinwunmi and Ikpi 1987). According to Singh (1990) almost all parts of poultry products have one or the other kind of industrial uses

The potential of natural feed additives like ginger and garlic as replacement for synthetically produced antibiotic, growth promoters in broilers chicks diet was discovered to be the bioactive substance. Natural feed additives are known to contain bioactive substances like (Oleoresin) which aid physiological performance of the body and organs of broiler chicks (Zhang et al., 2009). Also contained in ginger and garlic roots are vitamins, minerals and enzymes which are capable of boosting immune system (Karangiya, *et al.*, 2016)

MATERIALS AND METHODS

Experimental site

The experiment was carried out in the Poultry Unit of the Teaching and Research farm and Meat Science laboratory of Faculty of Agriculture Ambrose Alli University, Ekpoma.

Experimental design

The one hundred and eighty (180) day-old Isa white cockerel chicks purchased from a reputable hatchery in South/West, Nigeria were used in the experiment. They were brooded and feed commercial broiler starter mash for four weeks acclimatization period before allotting them to different treatment diets. The design of the experiments was completely randomized design (CRD). With T₁ as the control, T₂ Ginger (2%), T₃ Garlic (2%) and T₄ Combination of Ginger and Garlic (1:1%).

Experimental procedure

This stage involved assessing the effect of Ginger and Garlic on the carcass characteristics of broiler chicken. At the end of the feeding trial, three birds (3 per replicate) were selected based on the average weight per treatment group for carcass analysis. Each bird was tagged and weighed before and after slaughtering to determine the live and bled weight. The slaughtered broilers were dipped in hot water for about two minutes and the feathers were plucked. The plucked weights were recorded. The plucked chickens were eviscerated and the dressed weight were measured. The carcasses were thereafter cut into parts, such as head, neck, drumstick, shank, breast, back, bursa and wings. The weights of the parts were recorded and measured relative to their eviscerated weight. The weight of organs such as kidney lungs, liver, pancreas and spleen were also measured and recorded in relative to their eviscerated weight using the sensitive and the normal scale.

RESULTS

The results of carcass characteristics of broilers fed dietary Ginger, Garlic and Mixture of Ginger and Garlic Powder (treatment T₁, T₂, T₃ and T₄) were shown in Table 1. Carcass characteristics of birds including eviscerated weight, dressing percentage and primal cuts (head, neck, back, wings, breast muscles, thighs, drumsticks) were significantly ($P<0.05$) influenced by the dietary treatments; while relative weight of shanks and bursa were not affected significantly ($P>0.05$) by the dietary treatments. Average final live weight was significantly ($P<0.05$) highest among birds fed the T₄ with mean value of 2.69kg, followed by similar values of 2.64kg and 2.62kg from those placed on T₃ and T₂ while least value of 2.49kg observed from birds fed T₁. Also, bled weight was significantly ($P<0.05$) higher among birds fed T₄ with mean value of 2.59kg, followed by 2.57kg from birds maintained on T₃ comparable to 2.51kg from those placed on T₂ while lowest value of 2.39kg was observed from birds fed T₁. Plucked weight and Eviscerated weights followed the same trend with significant ($P<0.05$) highest values (2.45 and 2.37kg) recorded among birds placed on the T₄, followed by 2.43 and 2.35kg/bird from birds maintained on T₃ comparable to 2.41 and 2.32kg from those placed on T₂ while lowest value of 2.32 and 2.22kg/bird was observed from birds fed T₁. Dressing percentage was highest ($p<0.05$) among birds placed on T₁ diet with a percentage value of 89.16% followed by a statistically similar value 89.02% in birds placed on T₃, followed by 88.55% in those fed T₂ and lowest mean value of 88.10% was recorded among birds fed T₄.

Table 1: Carcass Characteristics of Broiler Fed Ginger, Garlic and Mixture of Ginger and Garlic Powder.

Parameters	T ₁ G/G (0%)	T ₂ GRP (2%)	T ₃ GBP (2%)	T ₄ MGGP (1:1%)
Final live weight (kg/bird)	2.49±0.08 ^b	2.62±0.04 ^a	2.64±0.05 ^a	2.69±0.03 ^a
Bled weight (kg/bird)	2.39±0.09 ^b	2.51±0.04 ^a	2.57±0.07 ^a	2.59±0.12 ^a
Plucked weight (kg/bird)	2.32±0.20 ^b	2.41±0.05 ^a	2.43±0.11 ^a	2.42±0.06 ^a
Eviscerated weight (kg/bird)	2.22±0.11 ^c	2.32±0.11 ^b	2.35±0.11 ^{ab}	2.37±0.11 ^a
Dressing percentage (%)	89.16±1.79 ^a	88.55±3.98 ^{ab}	89.02±2.48 ^{ab}	88.10±1.81 ^{ab}
Cut Parts (%)				
Head	2.49±0.16 ^b	3.47±0.041 ^a	3.77±0.33 ^a	3.47±0.04 ^a
Neck	4.18±0.50 ^b	3.44±0.41 ^c	5.78±0.56 ^a	4.84±0.38 ^{ab}
Back	14.48±0.84 ^{ab}	13.88±0.48 ^b	17.83±0.24 ^a	16.63±0.25 ^a
Wings	9.60±0.47 ^b	9.36±0.20 ^b	11.89±0.93 ^a	10.12±1.00 ^{ab}
Breast muscles	22.18±2.37 ^{ab}	22.03±1.01 ^{ab}	19.42±2.11 ^b	23.95±2.14 ^a
Thigh muscles	10.79±0.47 ^b	11.03±0.59 ^{ab}	12.36±0.81 ^a	11.55±1.07 ^{ab}
Drumsticks	11.17±0.67 ^{ab}	11.18±0.001 ^{ab}	13.48±0.93 ^a	12.12±1.00 ^{ab}
Shanks	4.18±0.50	4.70±0.29	4.78±0.56	4.84±0.38 ^{ns}
Bursa	1.10±0.06	1.03±1.03	1.07±0.10	1.29±0.14 ^{ns}

Mean on the same row with different superscripts are significantly different ($P<0.05$).

T₁=G/G = Ginger and Garlic

T₂=GRP = Ginger rhizome Powder

T₃=GBP = Garlic Bulb Powder

T₄=MGPP = Mixture of Ginger rhizome Powder and Garlic Bulb Powder

DISCUSSION

Broiler chickens in this study placed on 2% ginger and garlic powder had the highest average live weight comparable to those on the control diet which translated to the highest bled weight, plucked weight and eviscerated weight. This suggests that the experimental animal performed well on diet formulated with 2% mixture of ginger and garlic and this is not far from the fact that ginger rhizome and garlic bulb contains some aromatic components that enhance digestion and utilization of feed thereby improving the growth rate which led to the higher live weight. This finding is in consonance with the earlier reports of Duruna *et al.* (2006) who observed differences on the live weight, plucked weight and eviscerated weight of broilers fed varying levels of *Anthonata macrophylla* seed powder. The finding is also in agreement with the report of Karangiya *et al.*, (2009) who reported a significant variation in the live weight and dressed weight values of broiler chickens fed ginger and garlic powder as natural feed additives.

The dressing percentage in this study was highest from birds fed the control comparable to those on 2% ginger and garlic mixture. This report is in consonance with the finding of Oleforuh-Okolehet *et al.*, (2014) who reported a significant variation in the dressing percentage of weaner rabbits fed grind mixture of ginger and garlic. The significantly ($P<0.05$) highest value recorded for head, neck, back and wings from bird fed 2% Garlic bulb powder could be adduced to the fact that the birds had more bone at various cut parts and that have influenced their weight compare to other birds placed on treatment diets. Unfortunately, the muscle yield was at the expense of the backbone formation. This is in accord with the report of Safa, (2014) who reported a significant ($P<0.05$) difference in the head, neck, back and wings value of broiler chicken fed 3% Garlic powder.

The significant variation recorded in the breast muscle value of broiler fed the control diet is similar to that of those on 2% ginger rhizome powder shows that inclusion of 2% ginger rhizome powder has no adverse effect on the breast muscle of the birds. This comparable weight value of breast muscle of birds fed 2% ginger and the control support the assertion that at 2% level of inclusion of ginger rhizome powder can perform well without any deleterious effect on the primal cuts like breast muscle which happens to be the choice part in broiler chicken and dressed weight of cut part is suggested to be relative value of dressed saleable carcass for maximum profit in broiler chicken (Anonymous, 2008). The significant variation recorded in this study for thigh muscle and drumstick among birds placed on 2% garlic bulb powder is a pointer to the fact that inclusion of the spice (garlic bulb powder) up to 2% enhanced the muscle formation in the thigh and drumstick which is the choice part of most chicken consumers.

The higher weight value of the primal cuts of broilers fed on 2% garlic bulb powder supports the assertion that at 2% level of inclusion of garlic bulb powder, the birds can perform well without any deleterious effect on the primal cuts like breast muscle and drumstick which happens to be the choice parts in broiler chicken and dressed weight of cut part is suggested to be relative value of dressed saleable carcass for maximum profit in broiler chicken (Anonymous, 2008). This finding is in consonance with the report of Oleforuh-Okoleh *et al.* (2014) who reported a significant difference in the breast muscles of broiler chicken fed ginger powder.

Relative weight of shank and bursa did not differ significantly among the treatment diets in this study. It shows that inclusion of the various feed additives up to 2% has no adverse effect on primal cuts like shank and bursa. This comparable weight value of these primal cuts of broilers on all the additives support the assertion that at 2% level of inclusion of ginger, garlic or the mixture of ginger and garlic powder in the feeds of the birds can perform well without any deleterious effect on the primal cuts.

CONCLUSION AND RECOMMENDATION

It is concluded that the carcass characteristics of broiler were positively influenced by the dietary treatments especially at finisher phases. Therefore, in order to enhance the carcass characteristics of

broiler chicken; it is recommended that ginger, garlic and mixture of ginger and garlic powder could be included in their diet at (2%) each and 1:1 when combined.

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