CARCASS CHARACTERISTICS OF BROILER CHICKENS FED SUPPLEMENTS WITH VARYING LEVELS OF DRY GUAVA (*Psidium guajava*) LEAF MEAL AS PHYTOGENIC ADDITIVE

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ABSTRACT
This study was conducted to determine characteristics of broiler chicken fed varying levels of dry guava (Psidium guajava) leaf meal (DGLM) as phytogenic additive. The study lasted or 8 weeks and was conducted at the University of Calabar Teaching and Research Farm, Cross River state. A total number of 180 unsexed day-old broiler chicks were used for the study. The birds were randomly distributed into four (4) dietary treatments designated as control (0 g), 450g, 500g and 550g dry guava leaf meal (DGLM) per 100kg basal diets with 45 birds per treatment, each treatment had 3 replicates, with 15 birds per replicate and were laid in a Completely Randomized Design (CRD). The test diets and water were given to the bird's ad-libitum. The result of carcass characteristics showed that the levels of guava leaf meal supplementation did not significantly (p>0.05) influence the carcass and organ parameters measured. However, birds fed 550g DGLM had numerically higher live and dressed weight followed by those fed 500g DGLM/kg basal diet. This study suggests that the inclusion of DGLM in the feed of broiler birds does not have detrimental effect on their carcass characteristics.
Keywords: Carcass, Broilers, Guava leaf meal, Phytogenic, Supplementation

INTRODUCTION

The Poultry industry is constantly seeking innovative and sustainable ways to improve bird's performance, health and meat quality. Antibiotics and other synthetic compounds were until now, used globally as feed additives to improve gut health, immunity and growth performance in broiler chicken (Velmurugu, 2024; Abang *et al*., 2023). Feed additive is referred to as the low inclusion products used in diets (less than 0.05%) for the purpose of improving the nutritional quality of feed or the animal performance and health (Velmurugu, 2024). Although these substances attain good performance, their side and residual effects both in humans and animals have become a real public health concern globally (Bacanli and Basaran, 2019). This eventually led to the ban of growth promoting antibiotics (Odoemelam, 2013). This challenge has led to alternative/non-conventional source of feed additives such as leaf meal, herbs and spices and their products as supplements in animal rations to improve their health status and physiological conditions (Abd El-Hack *et al*., 2022; Reyan *et al*., 2020). The new class of natural feed additives are referred to as Phytogenics (Bajagai *et al*., 2022; Singth and Gaikwad, 2020).

Guava leaf is a new class of 'phytogenics' which is a natural feed additive that has gained attention for potentials to enhance animal productivity and wellbeing. Guava (*Psidium guajava*) leaf meal, rich in bioactive compounds as a phytogenic additive in poultry nutrition. According to (Odoemelam *et al*., 2013) all the body parts of guava plant as well as the by-product have been used effectively and scientifically validated both for nutritional purposes and medical purposes (Takeda *et al.*, 2022). This study therefore investigates the effects of supplemental levels of dry guava (*Psidium guajava*) leaf meal on the carcass and organoleptic properties of broiler chicken.

MATERIALS AND METHODS

The study was carried out at the Poultry Unit of the Teaching and Research Farm, University of Calabar, Calabar, Cross River State, Nigeria. Calabar is located at 4.9517^0 latitude and 8.322^0 longitude with an average elevation of 42 metres. Calabar has an average temperature of 25.8 ℃ with average rainfall of 3,306.00 mm per annum and relative humidity of 91.18% (Nigerian Meteorological Agency, 2024). Fresh guava leaves were harvested at mid age, not too fresh and not too old avoiding too much moisture content and fibre respectively. the samples were washed to get rid of dust, insects and other debris, sun dried for four days and milled (harmer) into a fine powdery form to form the dried guava leaf meal (DGLM) that can be mixed perfectly with the feed. The experimental diet was formulated to contain 23% crude protein and 3049.00 kg/kcal of energy for starter broiler and 19.50% crude protein and 3033.82 kg/kcal for finisher broiler. The control diet had no inclusion level of dried guava leaf meal (0g; DGLM) while other treatments had T2: 450 g, T3: 500 g and T4; 550 g of dried guava leaf meal per 100kg of basal feed (Table 1).

A total of 180-day old unsexed broiler chicken from Gabty Agric Services with average weight of 40g were randomly allotted in to four (4) dietary treatments in a Completely Randomized Design (CRD) with 45 birds per

treatment, with each treatment having 3 replicated and 15 birds per replicate. From day old, the experimental birds were fed *ad-libitum* in two phases; the starter diet for four weeks and finisher diet for another four weeks.
At week eight, 12 birds, 3 from each treatment were selected on a weight basis ranging between 2450.00 g to 2183.33 g and humanely slaughtered. The parameters measured include; live weight using 20 kg capacity weighing balance while eviscerated weight, dressed weight, drum sticks, breast, back, wings, thigh, shank, head, neck, liver, full gizzard, empty gizzard, kidney, spleen, lungs, crop, esophagus, proventriculus, pancreases, heart, trachea, gall bladder, abdominal fat and intestinal weight and length were measured and recorded using Bomata sensitive scale. The weight of the dressed carcass with the head was used to calculate the relative weight.
Statistical Analysis
All data collected were subjected to a one-way analysis of variance (ANOVA) of SPSS 2020, version 22

Table 1: Composition of starter and finisher broiler chickens diets supplemented with varying levels of guava (*Psidium guajava*) leaf meal as phytogenic additives

Ingredient	Starter (kg)	Finisher (kg)
Maize(yellow)	43.54	53.16
Soybean	35.17	27.47
Wheat offal	5.00	5.00
Palm kernel cake	3.00	3.00
Blood meal	5.86	4.58
Fish meal	2.93	2.29
Bone meal	2.50	2.50
Lime stone	1.00	1.00
Salt	0.25	0.25
Vitamin/mineral premix	0.25	0.25
Lysine	0.25	0.25
Methionine	0.25	0.25
Total	100.00	100.00
Calculated Analysis:		
ME (Kcal/Kg)	3049.00	3033.82
Crude protein (%)	23.00	19.50
Crude fibre (%)	3.31	3.20
Calcium (%)	2.68	1.81
Phosphorus (%)	2.97	2.50

RESULTS AND DISCUSSION
The carcass characteristics and organ weight of broiler chickens fed with supplemental levels of dry guava leaves presented in Table 2 and 3.

Table 2: Carcass characteristics of broiler chickens fed diet supplemented with varying levels of graded dry guava (*Psidiumguajava*) leaf meal

Parameters (g)	Treatments				SEM
	0gDGLM	450gDGLM	500gDGLM	550gDGLM	
Live weight	2333.33	2183.33	2250.00	2450.00	106.68NS
Eviscerated weight	1866.67	1804.67	1868.00	1980.33	99.86NS
Dressed weight	1859.40	1794.11	1861.05	1973.73	75.17NS
Weight of cuts parts;					
Breast	21.87	29.64	21.68	20.50	1.02NS
Back	14.09	17.38	15.56	14.83	1.02NS
Thigh	11.83	15.14	11.90	11.77	0.83NS
Drumstick	10.80	13.37	10.27	11.14	0.65NS
Shank	3.61	4.70	4.01	4.06	0.24NS
Wings	7.68	9.07	7.65	7.78	0.46NS
Head	2.12	2.82	2.18	2.39	0.16NS
Neck	4.79	5.91	4.85	4.74	0.30NS

SEM: Standard error of mean
NS: No significant difference (P>0.05)
DGLM: Dry guava leaf meal

The result shows that there was no significant (p>0.05) difference due to supplemental levels of dry guava leaf meal in all the carcass parameters measured. The live weight of chickens fed the dietary treatments ranged from 2183.33 g to 2450.00 g with birds fed 550g DGLM having the highest weight while those fed 450g DGLM has the least live weight. Eviscerated weight ranged from 1804.67 g to 1980.33 g in birds fed 450 g DGLM and control respectively, whereas, the dressed weight was 1859.40 g, 1794.11 g, 1861.05 g and 1973.73 g representing for birds fed control, 450 g, 500 g and 550 g of dried guava leaf meal respectively. The non-significant (p>0.05) differences in carcass and organ characteristics obtained in this study is in line with the findings of Adeyemi *et al*. (2022) who reported that carcass traits were unaffected by dietary supplementation of guava leaves in broiler diets. This observation is however contrary to the findings of Echeonwu (2017) who reported that supplementation of diet with guava leaves significantly influenced carcass and organ characteristics of broiler birds. The variation could be attributed to the differences in the inclusion level and age of the dry guava leaf meal and breed/strain, sex, of broiler birds used.

Table 3: Organs weights of broilers chicken fed supplemented levels of graded dry guava leaf meal

Parameters	Treatments				SEM
	0g DGLM	450g DGLM	500gDGLM	550g DGLM	
Esophagus	0.17	0.19	0.23	0.15	0.02NS
Crop	0.29	0.46	0.51	0.37	0.05NS
Proventriculus	0.63	0.75	0.61	0.66	0.03NS
Full gizzard	2.79	3.71	2.97	2.94	0.21NS
Empty gizzard	2.01	2.55	2.04	2.05	0.14NS
Pancreases	0.25	0.36	0.28	0.34	0.02NS
Lungs	0.46	0.65	0.53	0.50	0.04NS
Trachea	0.14	0.22	0.10	0.11	0.02NS
Heart	0.46	0.56	0.44	0.49	0.03NS
Liver	1.91	2.48	1.85	1.82	0.13NS
Gall bladder	0.08	0.10	0.18	0.11	0.02NS
Spleen	0.11	0.18	0.10	0.13	0.02NS
Abdominal fat	0.59	0.97	0.67	0.71	0.12NS
Kidney	0.34	0.29	0.24	0.25	0.03NS
Duodenum	1.09	1.18	0.89	0.98	0.10NS
Jejunum	0.63	1.07	0.64	0.74	0.10NS
Ileum	3.09	4.57	3.39	2.48	0.40NS
Caeca+column	0.66	0.78	0.70	0.78	0.05NS
GIT	15.69	19.83	14.44	14.63	0.97NS

SEM: Standard error of mean
NS: No significant difference (P>0.05)

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