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# Carcass Characteristics, Internal Organ Properties, And Sensory Evaluation OF Broiler Chicken Fed Processed Guava (*Psidium guajava*) Leaf Meal

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**ABSTRACT**
Guava leaf-meal is a promising natural additive rich in nutrients and phytochemicals with potential benefits to broiler performance. Harvested guava leaves were divided into two parts: one was rinsed and air-dried without any further processing, while the second part was soaked in water for 24 hours before air-drying. The dried leaves were milled separately into powder, packed and tagged as Un-soaked Guava Leaf Meal (UGLM) and Soaked Guava Leaf Meal (SGLM), respectively. Seven experimental diets were formulated: Diet 1 (control) contained no leaf meal, diets 2, 3, 4, 5, 6, and 7 contained 2% UGLM, 4% UGLM, 6% UGLM, 2% SGLM, 4% SGLM, and 6% SGLM, respectively. A total of 168 one-day old Ross 308 broiler chicks were randomly assigned to seven dietary treatment groups with three replicates each in a completely randomized design. Data collected on carcass, internal organ and meat sensory characteristics were subjected to One-Way Analysis of Variance (ANOVA). Liveweight, carcass weight, dressing percentage, and primal cuts were not significantly ($p>0.05$) affected by either UGLM or SGLM inclusion. However, neck weight was significantly ($p<0.05$) heavier in birds fed UGLM and SGLM compared to control. Significant differences were also observed in neck ($p=0.01$), wings ($p=0.02$), heart ($p=0.01$), gizzard ($p=0.03$), and proventriculus ($p=0.05$). Meat flavour and general acceptability were statistically similar across treatments, however, meat from birds fed 2% UGLM had a significantly higher consumer acceptability. It is concluded that incorporation of 2% Un-soaked guava leaf meal enhances meat sensory properties and consumer preference in broiler chicken.

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## INTRODUCTION
The poultry sector remains a critical pillar of global food security, it is fundamental in addressing the protein need of the growing human population while also acting as a driver for economic growth and social development (Ngongolo *et al*., 2021). However, with the rapidly growing human population, there is a growing demand for intensification of production to cater for the unmet demand for poultry meat (Abbas *et al*., 2025).
The search for safe, affordable, and functionally effective alternative feed ingredients/additives has gained wider popularity in poultry production. Guava leaf is a natural, nutrient and phytochemical-rich alternative capable of potentially improving performance traits in broiler chickens (Khanna *et al*., 2025).
Despite several works on the nutritional and phytochemical potential of *Psidium guajava* leaf meal in broiler production, its effects as a feed ingredient on carcass characteristics, internal organ integrity, and sensory attributes as influenced by processing methods demand critical examination. The condensed tannin content in unprocessed guava leaf meal presents a dicey nutritional reality. Daing *et al*., (2021) reported that at optimal inclusion levels, these bioactive compounds reduced abdominal fat deposition and improved lymphoid organ development, yet at elevated concentrations, they impose antinutritional constraints that may compromise meat palatability and organ homeostasis (Abang *et al*., 2023).
Hence this study was designed to evaluate the carcass characteristics, internal organ properties, and sensory qualities of broiler chickens fed processed *Psidium guajava* leaf meal.

## MATERIALS AND METHODS
### Experimental Site
The study was conducted at the Poultry unit, Teaching and Research Farm of Ladoke Akintola University of Technology, Ogbomoso, Oyo State, Nigeria. Ogbomoso is located in the derived savannah zone that lies on longitude $4^0 10^1$east of Greenwich meridian and latitude $8^0 10^1$North of equator. The altitude ranges from 300m to 600m above sea level and the mean temperature and annual rainfall are $27^0$C and 1247mm, respectively (Google Earth, 2020).

### Collection, Processing of Test Ingredients and Feed Preparation
Fresh guava leaves were harvested from guava trees around Ogbomoso, Oyo State, Nigeria. The harvested guava leaves were divided into two parts, one part was rinsed and air-dried without any further processing while the second part was soaked in water for 24hours before being air-dried. The dried leaves were milled separately into powdery form, weighed and carefully packed in a polythene bag and tagged Un-soaked Guava Leaf Meal (UGLM) and Soaked Guava Leaf Meal (SGLM) respectively.
Seven (7) experimental diets were formulated for both the starter and finisher phase of the study, containing different inclusion levels of the test ingredients. Diet 1 which serves as the control diet contained no leaf meal, while diets 2, 3, 4, 5,

6, and 7 contained 2% UGLM, 4% UGLM, 6% UGLM, 2% SGLM, 4% SGLM, and 6% SGLM, respectively. The gross composition of the diets is shown in Table 1 and 2 respectively.

**Table 1: Gross Composition of Experimental Diets for Starter Phase**

| Ingredients (%) | D1 (0%) | Un-soaked Guava leaf meal | | | Soaked Guava leaf meal | | |
|---|---|---|---|---|---|---|---|
| | | D2 (2%) | D3 (4%) | D4 (6%) | D5 (2%) | D6 (4%) | D7 (6%) |
| GLM | 0 | 2 | 4 | 6 | 2 | 4 | 6 |
| Maize | 45 | 45 | 45 | 45 | 45 | 45 | 45 |
| Soya bean meal | 27 | 27 | 27 | 27 | 27 | 27 | 27 |
| Wheat Offal | 11 | 10 | 9 | 8 | 10 | 9 | 8 |
| Corn Bran | 10.7 | 9.7 | 8.7 | 7.7 | 9.7 | 8.7 | 7.7 |
| Fish meal | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Bone meal | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 |
| Limestone | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Lysine | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 |
| Methionine | 0.18 | 0.18 | 0.18 | 0.18 | 0.18 | 0.18 | 0.18 |
| *Premix | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 |
| Salt | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 |
| Total | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| **Determined Analysis** | | | | | | | |
| *ME (Kcal/kg) | 2976 | 2984 | 2992 | 3000 | 2987 | 2998 | 3009 |
| Crude protein (%) | 21.65 | 21.74 | 21.83 | 21.92 | 21.78 | 21.91 | 22.04 |
| Crude Fibre (%) | 6.46 | 6.91 | 7.35 | 7.80 | 6.94 | 7.41 | 7.89 |
| Ether extract (%) | 3.77 | 3.85 | 3.93 | 4.01 | 3.86 | 3.95 | 4.04 |

*Premix- Vitamin A (IU) 1250000, Vitamin D3 (IU) 2500000, Vitamin E (Mg) 40000, Vitamin K3 (Mg) 2000, Vitamin B1(Mg) 3000, Vitamin B2 (Mg) 5500,, Niacin (Mg) 55000, Calcium Pantothenate (Mg) 11500, Vitamin B6 (Mg) 5000, Vitamin B12 (Mg) 25, Choline chloride(Mg) 5000000, Folic acid(Mg) 1000, Biotin (Mg) 80, Manganese (Mg) 120000, Iron (Mg) 100000, Zinc (Mg) 80,000, Copper (Mg) 8500, Iodine (Mg) 1500, Cobalt (Mg) 300, Selenium (Mg) 120, Antioxidant (Mg) 120. D= Diet; ME= Metabolizable Energy; GLM= Guava Leaf Meal

**Table 2: Gross Composition of Experimental Diets for Finisher Phase**

| Ingredients (%) | D1 (0%) | Un-soaked Guava leaf meal | | | Soaked Guava leaf meal | | |
|---|---|---|---|---|---|---|---|
| | | D2 (2%) | D3 (4%) | D4 (6%) | D5 (2%) | D6 (4%) | D7 (6%) |
| GLM | 0 | 2 | 4 | 6 | 2 | 4 | 6 |
| Maize | 50 | 50 | 50 | 50 | 50 | 50 | 50 |
| Soya bean meal | 23 | 23 | 23 | 23 | 23 | 23 | 23 |
| Wheat Offal | 15 | 14 | 13 | 12 | 14 | 13 | 12 |
| Corn bran | 6 | 5 | 4 | 3 | 5 | 4 | 3 |
| Fish meal | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 |
| Bone meal | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 |
| Limestone | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 |
| Lysine | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 |
| Methionine | 0.18 | 0.18 | 0.18 | 0.18 | 0.18 | 0.18 | 0.18 |
| *Premix | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 |
| Salt | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 |
| Total | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| **Determined Analysis** | | | | | | | |
| *ME (Kcal/kg) | 2848 | 2856 | 2864 | 2872 | 2859 | 2870 | 2881 |
| Crude protein (%) | 18.83 | 18.92 | 19.01 | 19.10 | 18.96 | 19.09 | 19.22 |
| Crude Fibre (%) | 5.59 | 6.04 | 6.48 | 6.93 | 6.07 | 6.54 | 7.02 |
| Ether extract (%) | 3.61 | 3.69 | 3.77 | 3.85 | 3.70 | 3.79 | 3.88 |

*Premix- Vitamin A (IU) 1250000, Vitamin D3 (IU) 2500000, Vitamin E (Mg) 40000, Vitamin K3 (Mg) 2000, Vitamin B1(Mg) 3000, Vitamin B2 (Mg) 5500,, Niacin (Mg) 55000, Calcium Pantothenate (Mg) 11500, Vitamin B6 (Mg) 5000, Vitamin B12 (Mg) 25, Choline chloride(Mg) 5000000, Folic acid(Mg) 1000, Biotin (Mg) 80, Manganese (Mg) 120000, Iron (Mg) 100000, Zinc (Mg) 80,000, Copper (Mg) 8500, Iodine (Mg) 1500, Cobalt (Mg) 300, Selenium (Mg) 120, Antioxidant (Mg) 120. D= Diet; ME= Metabolizable Energy; GLM= Guava Leaf Meal

**Experimental Animals and Management**

One hundred and sixty-eight one-day-old Ross 308 strain of broiler chicks sourced from a reputable hatchery were used for the experiment. The birds were randomly divided into seven groups of 24 birds each and the groups allotted to the seven diets in a completely randomized design experiment. Each dietary treatment was replicated three times with each replicate consisting of 8 birds. The birds were raised under intensive system using deep litter system. Each pen measured 1.48sq m. Water and feed were offered *ad libitum* using tray feeders during brooding stage and hanging feeders as the birds mature throughout the period of the experiment which lasted for six (6) weeks.

**Experimental Design**

The experiment was laid out in a Completely Randomized Design (CRD).

**Data Collection**

***Carcass and Internal Organ Evaluation***

At the end of the experiment, two birds were selected from each replicate for the evaluation of carcass and organ properties. The birds were fasted for twelve (12) hours prior slaughtering, tagged, weighed, bled and eviscerated. Live, bled and eviscerated weights were taken using electronic weighing scales. The carcass was cut into primal cuts: head, neck, wings, thigh, drumstick, breast muscle, back, shank and weighed. The carcass weight, dress weight, and cut parts were expressed as percentage of the live weight. Internal organ parts such as the liver, heart, spleen, kidney, lungs, proventriculus, and gizzard were also weighed and expressed as a percentage of the live weight.

The dressing percentage was also determined for each bird using the formula.

Dressing percentage = (Carcass weight ÷ Final live weight) X 100

Cut Parts = (Cut Parts ÷ Final live weight) X 100

Organ weight = (Cut Parts ÷ Final live weight) X 100

***Sensory Evaluations***

At the end of the experiment, one bird from each treatment was randomly selected and slaughtered. Meat from the breast muscle was cut into relatively equal portions and cooked in boiling water (80°C) for twenty minutes, allowed to cool under room temperature and served to ten (10) semi trained panelists. After being allowed to masticate one sample per treatment, the color, odor, texture, flavor, juiciness, and overall acceptability of each replicate were scored by the taste panelists on a 7-point hedonic scale 1 = "Strongly Disliked"; 2 = "Moderately Disliked"; 3 = "Slightly Disliked"; 4 = "Neither Liked nor Disliked"; 5 = "Slightly Liked"; 6= "Moderately Liked"; 7 = "Strongly Liked".

**Data Analysis**

All data obtained from this study were subjected to one-way analysis of variance (ANOVA) using IBM SPSS software package version 20. Where significant differences were indicated, Duncan multiple range test of the same software package was used to separate the means at 5% probability level.

## RESULTS AND DISCUSSION

**Carcass Characteristics**

The results presented in Table 3 revealed that there are no significant differences ($p>0.05$) among dietary treatments for most carcass parameters, including live weight (LW), bled weight (BW), defeathered weight (DW), eviscerated weight (EW), carcass weight (CW), dressing percentage (DP), breast meat (BM), thigh, shank, drumstick (DS), and back proportions. However, significant differences ($p\leq0.05$) were recorded for neck percentage and wing percentage. For neck percentage, birds fed D1 (control) recorded the lowest value (4.12%), while D3 (UGLM at 4%) produced the highest value (5.26%). For wing percentage, D1 (control) recorded the highest value (8.29%), while D5 (SGLM at 2%) recorded the lowest (7.69%).

These findings suggest that the inclusion of both un-soaked guava leaf meal (UGLM) and soaked guava leaf meal (SGLM) at varying levels (2%, 4%, and 6%) did not exert any detrimental influence on the overall carcass yield of broiler chickens. This is consistent with the report of Abdelghani *et al*. (2024), who noted that phytogenic additives such as guava leaf meal have no detrimental effect on body composition of rabbits when included within biologically tolerable levels. Similarly, Adeyemi *et al*. (2022) observed comparable dressing percentages among broilers fed graded levels of dry guava leaf meal, reinforcing the view that guava leaf supplementation at moderate inclusion rates is compatible with normal carcass development.

The notable impact on neck percentage may point to the varying bioavailability of phytochemical components (tannins and flavonoids) between soaked and unsoaked preparations. Soaking is known to reduce antinutritional factors such as condensed tannins, which may otherwise impair protein digestibility and muscle tissue deposition in specific anatomical regions (Ahmad *et al*., 2025; Zayed *et al*., 2025). The reduced wing yield in SGLM-supplemented birds may indicate a reallocation of muscle growth towards the breast and thigh areas. Comparable observations have been observed by researchers working with other phytogenic leaf meals; for instance, Adelowo *et al*. (2025) noted that pawpaw leaf meals influenced the relative proportions of carcass cuts without negatively affecting overall carcass weight in broilers.

**Table 3: Effect of Guava Leaf Meal on Carcass Characteristics of Broiler Chicken**

| Parameters | D1(0) | Level of UGLM inclusion (%) | | | Level of SGLM inclusion (%) | | | P-Value |
|---|---|---|---|---|---|---|---|---|
| | | D2(2) | D3(4) | D4(6) | D5(2) | D6(4) | D7(6) | |
| L W (g) | 1660.33 | 1662.00 | 1637.00 | 1649.50 | 1685.33 | 1700.33 | 1754.33 | 0.77 |
| B W (g) | 1602.67 | 1605.67 | 1593.33 | 1587.00 | 1656.33 | 1653.33 | 1704.33 | 0.67 |
| D W (g) | 1543.67 | 1547.67 | 1537.33 | 1534.00 | 1586.33 | 1594.33 | 1641.67 | 0.74 |
| E W (g) | 1282.33 | 1293.67 | 1302.00 | 1270.33 | 1312.33 | 1317.67 | 1376.67 | 0.80 |
| C W (g) | 1180.67 | 1190.33 | 1192.33 | 1165.67 | 1206.33 | 1211.00 | 1260.33 | 0.86 |
| D P (%) | 71.04 | 71.62 | 72.79 | 70.63 | 71.55 | 71.23 | 71.66 | 0.83 |
| Head (%) | 2.44 | 2.43 | 2.61 | 2.49 | 2.50 | 2.45 | 2.60 | 0.51 |
| Neck (%) | 4.12$^{b}$ | 5.21$^{a}$ | 5.26$^{a}$ | 5.19$^{a}$ | 4.60$^{ab}$ | 4.83$^{a}$ | 4.80$^{a}$ | 0.01 |
| B M (%) | 25.44 | 23.74 | 24.72 | 23.75 | 25.05 | 24.00 | 24.95 | 0.56 |
| Wings (%) | 8.29$^{a}$ | 8.13$^{ab}$ | 8.12$^{ab}$ | 8.26$^{a}$ | 7.69$^{b}$ | 7.78$^{ab}$ | 7.95$^{ab}$ | 0.02 |
| Thigh (%) | 10.55 | 10.97 | 11.24 | 10.54 | 10.73 | 11.12 | 10.88 | 0.30 |
| Shank (%) | 3.75 | 3.81 | 4.08 | 3.88 | 3.84 | 4.03 | 4.14 | 0.47 |
| D S (%) | 10.54 | 10.57 | 10.76 | 10.42 | 10.60 | 10.52 | 10.83 | 0.88 |
| Back (%) | 10.92 | 11.26 | 11.03 | 10.95 | 11.26 | 11.35 | 10.89 | 0.87 |

$^{ab}$: Means Along the Same Row with Different Superscripts are Significantly ($p<0.05$) Different. UGLM= Unsoaked Guava leaf Meal; SGLM= Soaked Guava Leaf Meal; D= Diet; L W = Live Weight; B W= Bled Weight; D W= Defeathered Weight; E W= Eviscerated Weight; C W= Carcass Weight; D P= Dressing Percentage; B M= Breast Meat; D S= Drumstick

**Relative Organ Weights**

The results for relative organ weights of the birds are presented in Table 4. The result shows that most internal organ weights such as kidney, lungs, spleen, liver, small intestine, large intestine, abdominal fat, pancreas, and caecum were not significantly affected (p>0.05) by dietary treatment. Significant treatment effects were, however, observed in weights of heart (p=0.01), gizzard (p=0.03), and proventriculus (p=0.05). Heart weight of birds on D5 (SGLM at 2%) recorded the lowest value (0.40%), while those on D7 (SGLM at 6%) recorded the highest (0.61%), with the control recording 0.47%. Birds on D6 (SGLM at 4%) recorded the highest value for gizzard weight, (2.00%), while those on D5 (SGLM at 2%) recorded the lowest (1.62%), compared to the control (1.69%). With respect to proventriculus weight, D1 (control, 0.71%) recorded the lowest value while D7 (SGLM at 6%) recorded the highest (1.40%).

The trend of non-significant effect of phytogenic additives across visceral organs is frequently reported in broiler studies (Lutfan *et al*., 2022; Zeeshan *et al*., 2022; Essien *et al*., 2024). This study indicates that the feed ingredients did not induce pathological enlargement or atrophy of vital organs. The absence of abdominal fat differences among treatment groups suggests that guava leaf meal at the inclusion levels tested for in this study does not promote or suppress adipogenesis, which aligns with earlier author (Lutfan *et al*., 2022). Abdominal fat weights observed in this study are lower than the findings of Essien *et al*., (2024) who reported the range of 0.21% to 0.97%. A slight increase in relative heart weight at higher SGLM inclusion levels may indicate a mild cardiovascular adaptation to the bioactive compounds present in soaked guava leaf meal, though values remained within physiologically normal ranges reported for commercial broilers (Karthika *et al*., 2019). This result aligns with several findings who reported that plant-based feed additives does not damage or affect the performance of the heart (Lala *et al.,* 2018; Oloruntola *et al*., 2019; Oloruntola *et al*., 2025). The observed enlargement of the gizzard in SGLM-supplemented birds, particularly at 4% inclusion, may be attributed to increased gizzard activity stimulated by the fibrous fractions retained in the soaked leaf meal (Lutfan *et al*., 2022), since soaking may not completely eliminate dietary fibre. Gizzard hypertrophy in response to dietary fibre and plant material has been documented in phyto-biotics research and is generally considered a physiological rather than pathological response (Han *et al*., 2017). The UGLM-supplemented birds showed a more moderate proventricular response compared to the SGLM group. The SGLM at 6% rose to 1.40% indicating that SGLM inclusion at higher levels may stimulate proventricular secretory activity, possibly through the action of tannins and polyphenols on gastric mucosa. This suggests that soaking alters the bioactivity profile of guava leaf bio-compounds in a manner that differentially influences the upper gastrointestinal tract.

**Table 4: Effect of Guava Leaf Meal on Relative Organ Weights of Broiler Chicken**

| Parameters (%) | D1(0) | Level of UGLM inclusion (%) | | | Level of SGLM inclusion (%) | | | P-Value |
|---|---|---|---|---|---|---|---|---|
| | | D2(2) | D3(4) | D4(6) | D5(2) | D6(4) | D7(6) | |
| Kidney | 0.59 | 0.58 | 0.52 | 0.59 | 0.55 | 0.63 | 0.54 | 0.82 |
| Lungs | 0.56 | 0.60 | 0.65 | 0.55 | 0.68 | 0.67 | 0.64 | 0.47 |
| Heart | 0.47[ab] | 0.58[ab] | 0.47[ab] | 0.46[ab] | 0.40[b] | 0.49[ab] | 0.61[a] | 0.01 |
| Spleen | 0.14 | 0.12 | 0.12 | 0.12 | 0.14 | 0.11 | 0.15 | 0.49 |
| Gizzard | 1.69[b] | 1.63[b] | 1.70[b] | 1.88[ab] | 1.62[b] | 2.00[a] | 1.86[ab] | 0.03 |
| Liver | 2.41 | 2.37 | 2.40 | 2.24 | 2.33 | 2.30 | 2.08 | 0.43 |
| Proventriculus | 0.71[b] | 0.83[b] | 0.90[b] | 1.05[ab] | 0.80[b] | 0.95[ab] | 1.40[a] | 0.05 |
| S I (%) | 6.51 | 5.82 | 5.32 | 6.40 | 6.55 | 5.84 | 5.57 | 0.68 |
| L I (%) | 0.26 | 0.36 | 0.20 | 0.28 | 0.24 | 0.30 | 0.26 | 0.41 |
| Abdominal fat | 0.11 | 0.34 | 0.20 | 0.34 | 0.29 | 0.06 | 0.12 | 0.24 |
| Pancreas | 0.26 | 0.30 | 0.28 | 0.34 | 0.32 | 0.30 | 0.31 | 0.48 |
| Caecum | 1.02 | 0.97 | 0.74 | 0.85 | 0.90 | 0.85 | 0.79 | 0.87 |

[ab]: Means Along the Same Row with Different Superscripts are Significantly (p<0.05) Different. S I = Small Intestine; L I= Large Intestine; SEM= Standard Error of Mean; UGLM= Unsoaked Guava Leaf Meal; SGLM= Soaked Guava Leaf Meal; D= Diet

**Organoleptic Properties**

The inclusion of both UGLM and SGLM in broiler chicken diet had no significant (p>0.05) effect on meat tenderness and texture. Birds that were given UGLM and SGLM were also similar to those given control in terms of meat flavour and general meat acceptability. Birds that were given 4% UGLM, 6% UGLM and 2% SGLM however had lower (p<0.05) meat colour score than the control group. Lower (p<0.05) meat juiciness was also observed in birds that were given 6% SGLM.

The significantly lower colour scores observed in UGLM-supplemented birds, particularly at higher inclusion levels and 2% SGLM may reflect the influence of polyphenolic pigments in guava leaf meal on myoglobin oxidation and the visual appearance of breast meat. This is supported by Almutairi *et al*., (2023) who reported that guava leaves are rich in quercetin, catechins, and other flavonoids which are known to exert antioxidant activity; however, high antioxidant activity can reduce metmyoglobin formation and thus alter the colour of meat (Tushar *et al*., 2023), potentially diminishing consumer colour preference. Similarly, Salihu *et al*. (2024), in their evaluation of *Ocimum gratissimum* and *Ocimum canum* supplementation on broiler organoleptic properties, reported significant variations in colour scores among herbal-supplemented groups relative to controls.

Reduction in flavour observed for SGLM-supplemented birds at lower inclusion levels may be because of residual volatile compounds from guava leaf polyphenols that subtly alter the flavour profile of cooked meat. Interestingly, D2 (UGLM at 2%) and D4 (UGLM at 6%) appeared to maintain or even improve flavour relative to the control, suggesting that the un-soaked form of guava leaf meal may contribute positively to aromatic compounds in breast meat (Melo *et al*., 2026). This is consistent with findings on other leaf meal supplements; Akinwumi *et al*., (2025) reported that scent leaf and sweet basil leaf meal supplementation significantly influenced the flavour of broiler meat, an effect attributed to the volatile essential oils retained in un-processed leaf material.

The reduction in juiciness at high UGLM inclusion levels may reflect the influence of tannins on meat water-holding capacity. This is supported by the report of Kumanda *et al*., (2019) that condensed tannins are known to bind to myofibrillar proteins and reduce their water-binding affinity, potentially leading to increased cook loss and reduced juiciness perception. The relatively higher juiciness meat obtained from SGLM-supplemented birds at 6% inclusion compared to their UGLM counterparts provides indirect evidence that soaking effectively reduces tannin content supported by Patil *et al*., (2024) who reported that soaking chicken pea overnight decreased its tannin content.

The superior general acceptability of birds fed UGLM at 2% over the control diet suggests that a low level of un-soaked guava leaf meal may enhance overall meat palatability without the negative trade-offs associated with higher tannin loads at increased inclusion levels. The progressive decline in acceptability with increasing UGLM inclusion beyond 2% is consistent with the dose-dependent antinutritional effects of condensed tannins reported by Daing *et al*., (2021), and with sensory quality deterioration at higher inclusion levels observed in other phytogenic leaf meal studies (Victoria *et al*., 2022; Abang *et al*., 2023).

**Table 5: Effect of Varying Inclusion Levels of Guava Leaf Meal on the Organoleptic Properties of Broiler Chicken**

| Parameters | D1(0) | Level of UGLM inclusion (%) | | | Level of SGLM inclusion (%) | | | P-Value |
|---|---|---|---|---|---|---|---|---|
| | | D2(2) | D3(4) | D4(6) | D5(2) | D6(4) | D7(6) | |
| Colour | $7.30^{a}$ | $6.70^{a}$ | $4.90^{bc}$ | $4.60^{bc}$ | $4.10^{c}$ | $6.90^{a}$ | $5.90^{ab}$ | 0.00 |
| Flavour | $5.80^{ab}$ | $6.40^{a}$ | $5.30^{ab}$ | $6.00^{ab}$ | $4.60^{b}$ | $5.40^{ab}$ | $5.40^{ab}$ | 0.02 |
| Juiciness | $5.80^{a}$ | $6.10^{a}$ | $5.00^{ab}$ | $4.30^{b}$ | $5.60^{ab}$ | $4.90^{ab}$ | $5.90^{a}$ | 0.04 |
| Tenderness | 5.20 | 5.00 | 5.10 | 3.90 | 4.30 | 4.70 | 5.00 | 0.51 |
| Texture | 6.20 | 6.30 | 6.20 | 6.20 | 6.10 | 6.50 | 5.70 | 0.86 |
| General Acceptability | $6.90^{ab}$ | $7.30^{a}$ | $5.30^{b}$ | $6.20^{ab}$ | $6.40^{ab}$ | $6.20^{ab}$ | $6.00^{ab}$ | 0.02 |

[abc]: Means Along the Same Row with Different Superscripts are Significantly ($p<0.05$) Different. SEM= Standard Error of Mean; UGLM= Unsoaked Guava Leaf Meal; SGLM= Soaked Guava Leaf Meal; D= Diet

## CONCLUSION

The dietary inclusion of guava leaf meals in the diet of broiler chicken had no negative effect on both carcass and relative organ properties of the birds. The inclusion of Un-soaked guava leaf meal however improved the flavour, juiciness, and general acceptability of broiler meat. Hence, the incorporation of 2% Un-soaked guava leaf meal can therefore be recommended for improved consumer sensory satisfaction.

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