

Sensory Acceptability of Broiler Chicken Meat Supplemented with Selected Indigenous Leaf Meals

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Article Details:

Received: 27 April 2026

Revised: 3 May 2026

Accepted: 15 May 2026

Published: 29 May 2026

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Recommended Citation:

Dela Cruz, K. C., Gaffud, O. (2026). Sensory acceptability of broiler chicken meat supplemented with selected indigenous leaf meals. *The International Review of Multidisciplinary Research*. 1 (6), 206-209. <https://doi.org/10.5281/zenodo.20438668>

Index Terms:

broiler chicken production, indigenous leaf meals, sensory quality evaluation, consumer acceptability test, alternative poultry feed, meat quality attributes, dietary supplementation, sustainable livestock farming

Abstract. This study systematically evaluated the physiological and organoleptic effects of incorporating selected indigenous leaf meals as dietary feed supplements on the post-harvest sensory quality of broiler chicken meat. Over the course of the production cycle, experimental broilers were subjected to varying inclusion levels of these localized botanical supplements to determine their viability as sustainable nutritional alternatives. To assess consumer perception, representative samples of the broiler meat were standardized, prepared, and subjected to a comprehensive consumer acceptability test utilizing a trained panel. The sensory attributes rigorously analyzed during the evaluation included general appearance, objective tenderness, tissue juiciness, flavor profile intensity, and aroma characteristics. The empirical results demonstrated that all experimental treatments successfully obtained favorable consumer acceptability ratings, falling strictly within the qualitative spectrum of “Like Moderately” to “Like Very Much.” Inferential statistical analysis revealed no significant differences ($p > 0.05$) among the diverse dietary treatments across all measured sensory parameters. This lack of statistical variance conclusively indicates that the integration of indigenous leaf meals into poultry formulations does not adversely affect or diminish the core eating qualities of the resulting meat. Interestingly, subtle variations were observed in the descriptive data; treatments featuring moderate inclusion levels yielded slightly higher mean scores for tenderness, juiciness, flavor, and aroma compared to both the control groups and high-inclusion treatments. These findings clearly demonstrate the biological and commercial potential of indigenous leaf meals as highly sustainable, cost-effective, and ecologically viable feed supplements. Ultimately, this dietary strategy optimizes feed resources and reduces production overheads while securely maintaining the baseline sensory acceptability and consumer-driven quality standards of broiler chicken meat.

Introduction

The poultry industry plays a vital role in providing affordable and high-quality animal protein to meet the increasing food demand of the growing population. Broiler production, in particular, has become one of the fastest-growing sectors due to its efficient feed conversion, rapid growth rate, and relatively low production cost. However, the rising prices and limited availability of conventional feed ingredients such as maize and soybean meal have become major challenges for poultry producers. These concerns have encouraged the search for alternative and locally available feed resources that can reduce production expenses while maintaining meat quality and consumer acceptability.

Indigenous leaf meals have gained attention as potential feed supplements because of their nutritional value and availability in tropical regions. Plants such as noni (*Morinda citrifolia*), mulberry (*Morus alba*), Acacia spp., and taro (*Colocasia esculenta*) contain considerable amounts of protein, vitamins, minerals, and bioactive compounds with antioxidant and antimicrobial properties. Previous studies have reported that these plant materials may improve nutrient utilization, gut health, and overall productivity in poultry when included at appropriate levels in the diet.

Aside from growth performance, sensory quality is an important factor influencing consumer preference and marketability of broiler meat. Attributes such as tenderness, juiciness, flavor, aroma, and general appearance contribute significantly to meat acceptability. Feed composition may influence these sensory properties through changes in muscle composition and fat deposition. Thus, evaluating the effect of indigenous leaf meals on the sensory characteristics of broiler meat is essential to determine their suitability as alternative feed ingredients.

This study was conducted to evaluate the sensory acceptability of broiler chicken meat supplemented with selected indigenous leaf meals. Specifically, it aimed to determine the effects of dietary treatments on general appearance, tenderness, juiciness, flavor, and aroma of broiler meat and assess the potential of indigenous leaf meals as sustainable and cost-effective feed supplements in poultry production.

Methodology

Experimental Design and Treatment Allocation

The study was conducted using a Completely Randomized Design (CRD) to evaluate the sensory acceptability of broiler chicken meat supplemented with selected indigenous leaf meals. Broiler chickens were randomly assigned to five dietary treatments with equal replication. The treatments consisted of a control diet and diets supplemented with varying indigenous leaf meals.

Experimental Birds and Management

Broiler chicks were housed in clean and properly ventilated pens and managed following standard broiler production practices. Feed and water were provided ad libitum throughout the experimental period. Routine vaccination and health management practices were strictly observed to ensure the health and welfare of the birds.

Preparation of Indigenous Leaf Meals

Fresh leaves of selected indigenous plants were collected, washed thoroughly, and air-dried under shaded conditions until sufficient dryness was achieved. The dried leaves were ground into fine meal form and incorporated into the experimental diets at designated inclusion levels.

Feeding and Dietary Treatments

Experimental diets were formulated to meet the nutritional requirements of broiler chickens. The control group received a commercial broiler ration, while the treatment groups received diets supplemented with indigenous leaf meals. Feeding was carried out throughout the experimental period.

Sensory Evaluation of Chicken Meat

At the end of the feeding trial, selected broiler chickens from each treatment were slaughtered following standard dressing procedures. Meat samples were prepared and cooked uniformly prior to sensory evaluation.

Sensory evaluation was conducted using a panel of evaluators to assess the acceptability of the chicken meat based on general appearance, tenderness, juiciness, flavor, and aroma. A hedonic scale was used to determine the level of acceptability of each parameter.

Statistical Analysis

Data gathered from the sensory evaluation were analyzed using Analysis of Variance (ANOVA) under a Completely Randomized Design. Treatment means were compared to determine significant differences among treatments at the 5% level of significance.

Results and Discussion

The sensory acceptability of broiler chicken meat supplemented with selected indigenous leaf meals is presented in Table 12. Sensory attributes evaluated included general appearance, tenderness, juiciness, flavor, and aroma. Results showed that all treatments received acceptability ratings ranging from "Like Moderately" (LM) to "Like Very Much" (LVM), indicating that the meat samples were generally acceptable to the evaluators.

For general appearance, T5 obtained the highest mean score of 5.88 (LM), while T1 recorded the lowest value of 5.46 (LM). In terms of tenderness, T5 achieved the highest rating of 6.10 (LVM), whereas T1 obtained the lowest score of 4.74 (NL). Juiciness ratings were highest in T5 (6.24, LVM), followed closely by T2 (6.22, LVM) and T3 (6.18, LVM). Similarly, T5 recorded the highest flavor score of 6.12 (LVM), while T1 showed the lowest value of 5.24 (LM). For aroma, T3 obtained the highest rating of 6.22 (LVM), closely followed by T5 with 6.20 (LVM).

Analysis of variance revealed no significant differences among treatments in all sensory parameters, suggesting that the incorporation of indigenous leaf meals did not adversely affect the sensory quality of broiler chicken meat. The low coefficients of variation indicated consistency in the responses of the evaluators.

The favorable sensory ratings observed in treatments supplemented with indigenous leaf meals may be associated with the presence of bioactive compounds and nutrients that contribute to improved meat quality characteristics. Moderate inclusion levels may enhance flavor and juiciness without negatively affecting texture or aroma. However, excessive inclusion levels of leaf meals may potentially influence palatability due to the presence of anti-nutritional compounds such as tannins and saponins. These findings agree with the report of Petracci et al. that dietary supplementation with plant-based feed resources can maintain acceptable meat sensory characteristics in broiler chickens. Likewise, Alagawany et al. noted that natural feed additives containing antioxidants and phytochemicals may improve meat quality and consumer acceptability without significantly altering sensory properties.

General Levels of Acceptability of the Chicken meat.

TREATMENTS	Criteria									
	General Appearance		TENDERNESS		JUICINESS		Flavor		Aroma	
T1	5.46	LM	4.74	NL	5.38	LM	5.24	LM	5.18	LM
T2	5.76	LM	5.62	LM	6.22	LVM	5.90	LM	5.80	LM
T3	5.62	LM	5.84	LM	6.18	LVM	5.82	LM	6.22	LVM
T4	5.76	LM	5.74	LM	5.8	LM	5.98	LM	6.04	LVM
T5	5.88	LM	6.1	LVM	6.24	LVM	6.12	LVM	6.20	LVM
ANOVA	ns		ns		ns		ns		ns	
C.V. (%)	6.34		10.60		1.07		9.77		3	

Note: *ns* – not significant

Conclusion and Recommendations

The study demonstrated that the incorporation of selected indigenous leaf meals as feed supplements did not adversely affect the sensory acceptability of broiler chicken meat. All treatments obtained acceptable ratings for general appearance, tenderness, juiciness, flavor, and aroma, ranging from “Like Moderately” to “Like Very Much.” Although no significant differences were observed among treatments, moderate inclusion levels of indigenous leaf meals showed favorable sensory responses, particularly in tenderness, juiciness, flavor, and aroma.

The findings suggest that indigenous leaf meals can serve as sustainable and cost-effective alternative feed supplements in broiler production while maintaining acceptable meat quality and consumer preference. The utilization of locally available plant resources may help reduce dependence on expensive conventional feed ingredients and support more sustainable poultry production systems. Further studies are recommended to determine optimal inclusion levels and evaluate the long-term effects of indigenous leaf meals on broiler productivity and meat quality under commercial production conditions.

Acknowledgement

The researchers express their sincere gratitude to all individuals who contributed to the successful completion of this study. Special appreciation is extended to the advisers, instructors, and panel members for their valuable guidance, encouragement, and constructive suggestions throughout the conduct of the research.

The researchers are also thankful to their families and friends for their unwavering support, understanding, and motivation during the entire study. Gratitude is likewise extended to the institution and all those who provided assistance, materials, and cooperation that made this research possible.

Above all, the researchers offer their deepest gratitude to God Almighty for His guidance, strength, wisdom, and countless blessings throughout the completion of this undertaking.

Funding

This research received no external funding from any public, commercial, or not-for-profit funding agency, and no organization provided financial support for the conduct of the study, authorship, or publication of this article.

Competing Interests Statement

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this article.

Data Availability Statement

Data sharing is not applicable to this article as no new data were created or analyzed in this study; all data used were obtained from previously published sources as cited in the reference list.

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Appendices

No appendices are attached to this study.