

EFFECTS OF IPOMOEA ASARIFOLIA-BASED DIETS ON CARCASS TRAITS AND RELATIVE ORGAN WEIGHTS IN BROILER CHICKENS

OLUWAFEMI ABEL AGBETUYI^{*1}, EMMANUEL KEHINDE ASANIYAN², TAIWO OLADOYE AKANDE³, TEMIDAYO SAMUEL JOSEPH¹, AYOMIDE ESTHER OLUWAMOLAKOMI¹, EMMANUEL DAMILARE BABATOPE¹

¹Department of Animal Production and Health, Federal University, Oye Ekiti, Nigeria

²Department of Animal Production and Health, Olusegun Agagu University of Science and Technology, Okiti Pupa, Nigeria

³Department of Animal Science, Obafemi Awolowo University, Ile-Ife, Osun State, Nigeria

ARTICLE INFORMATION

Article History:

Received: 19th September 2025
Accepted: 31st March 2026
Published Online: 30th June 2026

Author Contributions:

OAA designed the study, analyzed the data and drafted the manuscript. EKA and TOA supervised the work and reviewed the manuscript. TSJ, AEO and EDB assisted in data collection and laboratory work. All authors read and approved the final manuscript.

Key words:

Phytogenic feed additives, Ipomoea Asari folia leaf powder, Broiler chicken, Antibiotic growth promoter substitute, Carcass characteristics

Similarity Index:

16%

SDGs Targeted:

SDG 2: Zero Hunger and
SDG 12: Responsible Consumption and Production

ABSTRACT

Phytogenic feed additives have gained increasing interest as possible substitutes for antibiotic growth promoters in the poultry industry, particularly in broiler chicken production. Therefore, the present study was designed to evaluate the effect of Ipomoea asarifolia leaf powder as a natural growth-promoter substitute in broiler diets on carcass traits and relative organ weights, with the ultimate aim of promoting healthy food production. A total of 200 eight-day-old broiler chicks (Ross 308) were used in this study under a completely randomized design (CRD). The birds were randomly assigned to four dietary treatments, with five replicates of ten birds each. The four dietary treatments were designated as D1, D2, D3 and D4, containing Ipomoea asarifolia leaf powder on a dry matter basis at inclusion levels of 0.0%, 0.8%, 1.6% and 2.4%, respectively. At the end of the 42-day feeding trial, data were collected on carcass traits and organ weights of broiler chickens. The dressing percentage in D1 (69.49%) was significantly higher ($p < 0.05$) than that recorded in D3 (64.91%) but was statistically similar ($p > 0.05$) to those in D2 (68.22%) and D4 (68.62%). The relative weights of the lungs, liver and spleen in D1 were comparable ($p > 0.05$) to those recorded in D2, D3 and D4. The findings demonstrated that up to 2.4% Ipomoea asarifolia leaf powder can be safely included in broiler chicken diets without adversely affecting meat yield or the functionality of vital organs. These results support the use of non-conventional feed resources as a practical approach to improving poultry production efficiency and sustainability.

1. INTRODUCTION

Human being globally can access abundant minerals, vitamins, and protein from poultry products such as meat and egg due to its low saturated fatty acid content and unsaturated dietary fats (Vlaicu *et al.*, 2022). In addition to contributing to the gross domestic product (GDP), poultry business is a major source of income for low-income households and small holder groups.

With higher population growth, the demand for poultry products such as meat and egg has increased, the reason in-feed antibiotics (IFAs) are used by the poultry industry as sub-therapeutic agents to promote growth. The growth of broiler chickens is boosted by in-feed antibiotics, but their residual effects on poultry products cause antibiotic resistance in consumers, which can be detrimental to human health (Agbetuyi *et al.*, 2023a). The use of herbal and plant-based remedies for disease treatment has increased globally, with traditional medicine becoming more

*Corresponding Author: femzyright@gmail.com

Copyright 2017 University of Sindh Journal of Animal Sciences

popular among 60-80% of the global population, as reported by Abd El-Hack et al. (2023a). Feed expenses, which make up 60-70% of the total production costs, has largely been aggregated by dietary additives in the poultry industry (Abd El-Hack et al., 2024a; Mohamed et al., 2024). Organic feed supplements, which often contain artificial growth stimulants and antimicrobial agents, have been extensively used to enhance poultry and other animal's growth efficiency and carcass quality (Abd El-Hack et al., 2023b; Kamal et al., 2022).

The use of alternative methods instead of antibiotic growth promoters (AGPs) is gaining popularity among researchers to improve poultry welfare, product safety, and production efficiency (Agbetuyi et al., 2022; Yang et al., 2024). The outcome is that herbs and phytochemical compounds are being included as active dietary ingredients that enhance bird immunity and performance (Abdelli et al., 2021; Abd El-Hack et al., 2024b; Agbetuyi et al., 2024a). Species, phytochemical substances, their stability, purity, and the mode of action of these plant preparations determine their biological activity efficiency (Agbetuyi et al., 2025). The literature defines plant extracts as standardized products with multiple activities. The use of plants and plant products in poultry production was facilitated by antioxidant, antimicrobial, antiviral, and antifungal activity, as well as the secretion of endogenous enzymes, according to Agbetuyi et al. (2023b). Its other benefits reported in both humans and animals include the prevention of gastro-intestinal disorders, respiratory problems, and the use of antioxidants. The broiler chicken sub-sector can meet consumer demands despite hyperthermia by using phytochemical supplements that enhance the carcass traits of broiled chickens when exposed to high temperatures. Through the use of phytochemical supplements, carcass weight can be increased and its color can remain consistent by decreasing oxidative stress and improving nutrient absorption.

Just like in *Moringa oleifera* and garlic, *Ipomoea asarifolia* is an excellent example of a phytochemical plant that can promote poultry production by providing nutrient-rich foods while also promoting animal nutrition (Agbetuyi et al., 2023b; 2024a). These nutrient-rich foods called bioactive substances

are capable of promoting a safe diet with high quality feed, its use as natural sources of nutrients in animal diet is a promising solution to achieve the goal of ensuring the health and welfare of animals as well as the safety of their products (Arain et al., 2022; Chiroma et al., 2022). The high crude protein content and mineral profile of *Ipomoea asarifolia* make it a valuable feed ingredient in poultry production. Enhanced performance is achieved through the bioactive components in plants, which act as an effective antioxidant defense against the detrimental effects of heat stress and fat deposition. More so, the enormous chance of this plant to transform poultry industry has been scarcely utilized. Nevertheless, according to Leonard et al. (2022) the low level of supplementation of powdered leaf produced from *Ipomoea asarifolia* may be beneficial in broiler nutrition but its high crude fibre content could pose challenges with this use. Nevertheless, further information is needed on the use of *Ipomoea asarifolia* to contribute to effective poultry production. In this research, we hypothesized that the novel combination of biologically produced *Ipomoea asarifolia* leaf powder extract would enhance the overall performance of most of the broiler chickens in a favorable manner. Thus, the current research was done with the intention of examining the impact of stabilization of *Ipomoea asarifolia* leaf powder as natural growth promoters' substitute in broiler diet on carcass traits and relative organs weight, ultimately attempting to offer healthy food.

2. MATERIALS AND METHODS

Experimental site and period of experimentation

The experiment was carried out at the Poultry Research Unit of Animal Production and Health Department, Ikole Ekiti, Federal University, Oye Ekiti, Ekiti State, Nigeria – experimental site is 5.5145 °E longitude and 7.7983 °N latitude. Experimental site is located in tropical climate with average temperature of 24.2 °C per annum, and relative humidity variation of 57-92%. Rainy season is usually from April to October, whereas dry season is from November to March with an average annual rainfall of 500-3000mm. The feeding trial was conducted for 42 days.

Harvesting, preparation, and processing of *Ipomoea asarifolia*

Ipomoea asarifolia leaves which were fresh and yet to reach flowering stage were collected from the Ikole environment of Ekiti State. They were washed to eliminate dirt on the leaves and chopping was done to facilitate ease of drying. They were then placed on a clean concrete floor in ideally well-ventilated rooms for 7 -10 days, depending on room temperatures, until hardening to the crunch level. This was done to assist in nutrient loss avoidance and greenness coloration preservation. Leaves were powdered and ground in hammer mills with sieve 0.35-2.15 mm, and kept in an air-tight container for the research.

Birds' management and housing condition

Wood shavings were utilized as litter material and birds were housed in deep litter pens. Litter material was being replaced fortnightly to furnish a clean bedding material. Experimental pens had an average size of 4.76 m². Charcoal pots were used for heating during brooding stages. Brooding house temperature was maintained at 34 °C in the first week. It was altered to 32 °C in the second week, 30 °C in the third, and 25 °C in the fourth week. The birds were fed daily weighed amount of feed, but clean water and feed were available *ad-libitum*. A vaccination schedule was conceived and followed strictly.

Formulation of diet

Four experimental diets were formulated during starter (1-21 days) and finisher (22-42 days) phases. Nutritional requirement of broiler chicken was fulfilled through manual diet formulation as suggested by NRC (2024). The experiment was able to incorporate *Ipomoea asarifolia* leaf powder into all the four trial diets made for each phase and blended in homogenous meals. In a bid to include the phyto-supplements in fixed feed ingredients, the phyto-supplements were blended with other microminerals for one minute. This mixture was then blended with one kilogram of ground maize and homogenized by turning them over for another minute. The technique of preparing 100 kg of each of the experimental diets is by blending the weighed feed ingredients on the ground with a spade (Agbetuyi *et al.*, 2025).

Design, bird species, and their dietary regimens

Completely Randomized Design (CRD) was the design employed in this study. The investigation utilized 200 broiler chicks (Ross 308). The birds were randomly assigned to 4 nutritional regimens, with 5 replicates of 10 birds each. The Four treatments were identified, namely D1, D2, D3, and D4, with *Ipomoea asarifolia* leaf powder (IALP) being used on dry matter bases that had 0.0%, 0.8%, 1.6%, and 2.4% inclusion levels, respectively. The research was conducted in two phases. Feeding for each phase took 21 days, with the broiler starter being given from 1 to 21 days, and the broiler finisher between 22 and 42 days. In Table 1 and 2, the nutritional composition of the four experimental diets, which were designed for both starter and finisher diet types, is outlined below.

Collection of data

Carcass traits measurement

At the end of the 42 days feeding trial, forty birds that had similar weight as the average weight of birds were chosen at random, tagged, fasted for the whole night, and sacrificed by severing their jugular veins. The sacrificed birds were manually de-feathered after being scalded for two minutes at 80 °C. The gastrointestinal tracts were meticulously removed from the carcass by splitting it apart and eviscerating it to obtain the dressed carcass. This was then cut into different parts such as thigh, breast, shank, head, neck, wing, drumstick, back, and abdominal fat. A digital Camry scale (Sensitivity = 0.01g) was used to take the carcass weights. Eviscerated weight and dressing weight were expressed in terms of the percentage of the live weight of bird as shown below:

$$\text{Eviscerated \%} = \frac{\text{Eviscerated weight}}{\text{Live weight of bird}} \times 100$$

$$\text{Dressing \%} = \frac{\text{Dressing weight}}{\text{Live weight of bird}} \times 100$$

Relative organ weights

After taking the gastrointestinal tracts meticulously from the carcass by splitting it open and eviscerating it. The internal organs were separated from the tracts and a digital Camry scale (Sensitivity = 0.01g) was used to weight the organs such as lungs, gizzard, liver, kidney, spleen, heart, and pancreas, and the

results were reported in grams. The relative organ weights were calculated as follows:

$$\text{Relative organ weight (g/kg)} = \frac{\text{Organ weight}}{\text{Live weight of bird}} \times 1000$$

Statistical analysis

By using the General Linear Model Procedure of SAS (SAS Institute Inc, 2020) software and Tukey's Honestly Significant Difference (HSD), it was possible to analyze variance in one-way analysis with all data and then segregate significant means using HSD. The 5% level of probability was found to be significant for differences. Below is the experimental model that was used: $Y_{ab} = \mu + D_a + \beta_{ab}$

Where:

X_{ab} = Response in a^{th} replicate and b^{th} treatment

μ = Established means

D_a = Impact of dietary treatments (D1, D2, D3, and D4)

β_{ab} = Experimental error

3. RESULTS AND DISCUSSION

Carcass traits of broiler chicken fed *Ipomoea asarifolia* nutritional-based diets

The carcass traits of broiler chicken fed *Ipomoea asarifolia* leaf powder showed a significant ($p < 0.05$) effect of the dietary treatment on the dressing percentage of the birds but had no effects ($p > 0.05$) on other traits measured. The percentage dressing weight in D1 (69.49%) was substantially higher ($p < 0.05$) than the value obtained in D3 (64.91%), but similar ($p > 0.05$) to those in D2 (68.22%) and D4 (68.62%) [Table 3]. At D3 but not in D4, the percentage of dressing weight of the bird decreased steadily, indicating that inclusion should be around 2.4%, where nutritional benefits of the plant outweigh its anti-metabolic effects. A study conducted by Animashahun et al. (2025) found that the carcass composition of rabbit was not affected by high levels of *Bryophyllum pinnatum*, which was consistent with our findings. The powdered leaves of *Moringa oleifera* and the bulbs of *Allium sativum*, as discovered by Agbetuyi et al. (2023a; 2023b), were found to enhance the performance of broiler chicken. Literatures have it that, supplementation of broiler diet with certain phyto-genic plants can lead to higher yield and weight of carcass (Al-Garadi et al., 2025). *Capsicum annum* and *Adansonia digitata* have shown positive impacts on the carcass yield

(Chiwaya et al., 2025). Phyto-genic plants such as *Lippia javanica* supplemented at a rate of 25 g/kg of feed can lead to higher dressing percentage as in Japanese quail fed commercial growing diet (Mnisi et al., 2023). By using *Ipomoea asarifolia*, conventional feeds materials will be less expensive and can be used as a substitute for costly ingredients such as maize and soybean meal, which make up more than 70% of poultry production costs (Siddiqui et al., 2024; Shuma et al., 2025). Smallholder farmers in resource-limited areas can benefit from the plant's sustainability, which is bolstered by its ability to thrive in drought and poor soil conditions (Nkansah-Dwamena, 2024). However, as noted by Liu et al. (2025), the anti-metabolic components are to be minimized through careful processing such as air-drying.

Relative organ weights of broiler chicken fed *Ipomoea asarifolia* nutritional-based diets

In table 4, the relative organ's weight of birds fed *Ipomoea asarifolia* leaf powder was presented. The result indicates that the significant impact ($p < 0.05$) of dietary treatments was only limited to the lung, liver, and spleen. In D1, the values of lung, liver, and spleen was comparable ($p > 0.05$) to those in D2, D3, and D4. This study found that the effect of *Ipomoea asarifolia*, a leaf powder produced by the leaves in broiler production, is organ-specific and dose-dependent, which could be useful as a sustainable feed additive in broiler feed preparations. The weights of the lung and spleen are slightly increased at D4, meaning that higher inclusion levels of test material led to improved respiratory and immune function. It is likely that the plant's bioactive elements, including saponins, alkaloids, flavonoids, phenolic acids, and tannins contain antioxidants properties. The outcomes agreed with Song et al. (2023), who found that feeds rich in antioxidants can enhance immune organ development and immunity among poultry breeders. Research by Agbetuyi et al. (2025) postulated that the immune systems of broiler chickens are responding better, possibly due to phyto-supplement components found in *Moringa oleifera* and *Allium sativum*, this is supported by this present study. A rise in liver weight recorded in D3, may showcase the metabolic activity of the liver in detoxifying secondary metabolites. Air-drying in this study, as demonstrated by the similarity in liver weights between D1 and D4, reduces secondary metabolites content in the plant, which can enhance its safety (Agbetuyi et al., 2024).

4. CONCLUSION

The outcomes of incorporating broiler chickens fed with *Ipomoea asarifolia* leaf powder were investigated, with emphasis on the carcass traits and relative organs weight measurements. Additionally, it has been shown that up to 2.4% of the plant *Ipomoea asarifolia* can be safely included in the feed production without affecting the meat output or the vital organ's functionality in broiler chicken. By highlighting the importance of non-traditional feed resources, these results offer practical guidance on improving poultry production efficiency and sustainability.

5. CONFLICT OF INTEREST

The authors declare that there is no conflict of interest regarding the publication of this article.

REFERENCES

- Abd El-Hack, M. E., Ashour, E. A., Baset, S. A., Kamal, M., Swelum, A. A., Suliman, G. M., & Bassiony, S. S. (2024a). Effect of dietary supplementation of organic selenium nanoparticles on growth performance and carcass traits of broiler chickens. *Biological Trace Element Research*, 202(8), 3760–3766. <https://doi.org/10.1007/s12011-023-03948-x>
- Abd El-Hack, M. E., Ashour, E. A., Aljahdali, N., Zabermawi, N. M., Baset, S. A., Kamal, M., & Bassiony, S. S. (2024b). Does the dietary supplementation of organic nano-zinc as a growth promoter impact broiler growth, carcass and meat quality traits, blood metabolites, and cecal microbiota? *Poultry Science*, 103, 103550.
- Abd El-Hack, M. E., Abdelnour, S. A., Kamal, M., Khafaga, A. F., Shakoory, A. M., Bagadood, R. M., & Świątkiewicz, S. (2023a). Lactoferrin: Antimicrobial impacts, genomic guardian, therapeutic uses and clinical significance for humans and animals. *Biomedicine & Pharmacotherapy*, 164, 114967. <https://doi.org/10.1016/j.biopha.2023.114967>
- Abd El-Hack, M. E., Kamal, M., Alazragi, R. S., Alreemi, R. M., Qadhi, A., Ghafouri, K., & Abdelnour, S. A. (2023b). Impacts of chitosan and its nanoformulations on metabolic syndromes: A review. *Brazilian Journal of Biology*, 83, e276530.
- Abdelli, N., Sola-Oriol, D., & Perez, J. F. (2021). Phytogetic feed additives in poultry: Achievements, perspectives and challenges. *Animals*, 11, 3471. <https://doi.org/10.3390/ani11123471>
- Agbetuyi, O. A., Ekeocha, A. H., & Aganga, A. A. (2025). Effects of moringa and garlic addition to broiler's diet on growth, internal organs, and gut microbes. *Acta fytotechnica et Zootechnica*, 28(4): 324-335.
- Agbetuyi, O. A., Ekeocha, A. H., & Aganga, A. A. (2024a). Assessing the impact of moringa and garlic supplementation on egg production and quality in laying hens. *Dysona - Applied Science*, 5(2), 41–51. <http://dx.doi.org/10.30493/DAS.2024.451601>
- Agbetuyi, O. A., Ekeocha, A. H., Aganga, A. A., & Oloruntola, O. D. (2024b). Moringa oleifera and Allium sativum in broiler nutrition: Carcass traits, biochemical characterization and economic analysis. *Discover Food*, 4(1), 86. <https://doi.org/10.1007/s44187-024-00155-y>
- Agbetuyi, O. A., Ekeocha, A. H., & Aganga, A. A. (2023a). Organoleptic parameters, tibia bone growth and mineral retention of broiler chickens fed Moringa oleifera and Allium sativum. *Slovak Journal of Animal Sciences*, 56(3), 3–12. <https://doi.org/10.36547/sjas.819>
- Agbetuyi, O. A., Ekeocha, A. H., Aganga, A. A., & Apata, T. G. (2023b). The use of Moringa oleifera and Allium sativum, and funding of poultry production in Ekiti State, Nigeria. *Journal of Agriculture and Food Environment*, 10(3), 11–23.
- Agbetuyi, O. A., Ekeocha, A. H., Olobatoke, R. Y., & Aganga, A. A. (2022). Survey of farmers' additive awareness of moringa and garlic for chicken production in Ekiti State, Nigeria. *JABU International Journal of Agriculture and Food Sciences*, 12(2), 1733–1744.
- Animashahun, R., Alabi, O., Adegboye, O., Akinwale, F., Animashahun, A., & Adefioye, O. (2025). Bryophyllum pinnatum as an additive in the diets of weaned rabbits: Effect on performance, carcass analysis and meat quality. *Advances in Animal and Veterinary Sciences*, 13(9), 2006–2017. <https://dx.doi.org/10.17582/journal.aavs/2025/13.9.2006.2017>

- Arain, M. A., Nabi, F., Marghazani, I. B., Ul-Hassan, F., Soomro, H., Kalhoro, H., Soomro, F., & Buzdar, J. A. (2022). In ovo delivery of nutraceuticals improves health status and production performance of poultry birds: A review. *World's Poultry Science Journal*, 78(3), 765–788.
- Chiroma, S. S., Nazifi, A. B., Ya'u, J., Aliyu, M., Bichi, L. A., & Chiroma, S. M. (2022). Anti-seizure properties of *Ipomoea asarifolia* (Desr.) (Convolvulaceae) ethanolic leaf extract in laboratory animals. *Bulletin of the National Research Centre*, 46, 205. <https://doi.org/10.1186/s42269-022-00898-7>
- Leonard, U. C., Charles, O. O., Caleb, E. I., & Esther, C. C. (2022). Growth performance and cost benefits of broilers fed diets containing *Ipomoea asarifolia* leaf meal. *Indonesian Journal of Animal and Veterinary Sciences*, 27(1), 10–17. <http://dx.doi.org/10.14334/jitv.v27i1.2944>
- Kamal, M., Youssef, I. M., Khalil, H. A., Ayoub, M. A., & Hashem, N. M. (2022). Multifunctional role of chitosan in farm animals: A comprehensive review. *Annals of Animal Science*, 23, 69–86.
- Liu, B., Zhao, Y., Liang, G., Wang, Y., Yang, J., Qin, R., Luo, L., Wei, Z., Gao, S., & Li, Z. (2025). Effects of different drying methods on the nutrient composition of *Camellia sinensis* 'Guire 2' yellow tea revealed by metabolomics-based techniques. *European Food Research and Technology*, 251, 2225–2237. <https://doi.org/10.1007/s00217-025-04759-1>
- Mnisi, C. M., Mlambo, V., Gila, A., Matabane, A. N., Mthiyane, M. N., Kumanda, C., Manyeula, F., & Gajana, C. S. (2023). Antioxidant and antimicrobial properties of selected phytochemicals for sustainable poultry production. *Applied Sciences*, 13(1), 99. <https://doi.org/10.3390/app13010099>
- Mohamed, L. A., Dosoky, W. M., Kamal, M., Alshehry, G., Algarni, E. H., Aldekhail, N. M., & Farag, S. A. (2024). Growth performance, carcass traits and meat physical characteristics of growing Japanese quail fed ginger powder and frankincense oil as feed additives. *Poultry Science*, 103, 103771.
- Nkansah-Dwamena, E. (2024). Why small-scale circular agriculture is central to food security and environmental sustainability in Sub-Saharan Africa: The case of Ghana. *Circular Economy and Sustainability*, 4(2), 995–1019. <https://doi.org/10.1007/s43615-023-00320-y>
- Shuma, S., Senbeta, D. H., & Petunia, M. D. (2025). Dried blood–rumen content mixtures as sustainable poultry feed: A review on nutritional, economic and environmental potential. *Food Science & Nutrition*, 13(9), e70796. <https://doi.org/10.1002/fsn3.70796>
- Siddiqui, S. A., Elsheikh, W., Ucak, I., Hasan, M., Perlita, Z. C., & Yudhistr, B. (2024). Replacement of soy by mealworms for livestock feed: A comparative review between soy and mealworms considering environmental aspects. *Environment, Development and Sustainability*, 1–44. <https://doi.org/10.1007/s10668-024-04874-1>
- SAS Institute. (2020). User's guide: Statistics Version 9.48. SAS Institute, Inc.
- Song, W., Zou, Z., Chen, X., Tan, J., Liu, L., Wei, Q., Xiong, P., Song, Q., Chen, J., Su, W., & Xu, C. (2023). Effects of traditional Chinese herbal feed supplement on growth performance, immunity, antioxidant levels and intestinal health in chickens: A study on Ningdu yellow chickens. *Poultry Science*, 102(10), 102986. <https://doi.org/10.1016/j.psj.2023.102986>
- Vlaicu, P. A., Untea, A. E., Turcu, R. P., Saracila, M., Panaite, T. D., & Cornescu, G. M. (2022). Nutritional composition and bioactive compounds of basil, thyme and sage plant additives and their functionality on broiler thigh meat quality. *Foods*, 11, 1105.
- Yang, W., Li, J., Yao, Z., & Li, M. (2024). A review on the alternatives to antibiotics and the treatment of antibiotic pollution: Current development and prospects. *Science of the Total Environment*, 926, 171757. <https://doi.org/10.1016/j.scitotenv.2024.171757>

Table 1. Composition of experimental diets for broiler starter (g/100g)

Ingredients %	D1	D2	D3	D4
Maize	49.00	49.00	49.00	49.00
Soybean meal	32.50	32.50	32.50	32.50
Wheat bran	12.00	11.20	10.40	9.60
<i>Ipomoea asarifolia</i> leaf meal	-	0.80	1.60	2.40
Fishmeal 72%	1.50	1.50	1.50	1.50
Bone meal	1.00	1.00	1.00	1.00
Limestone	3.30	3.30	3.30	3.30
Methionine	0.20	0.20	0.20	0.20
Broiler premix	0.25	0.25	0.25	0.25
Salt	0.30	0.30	0.30	0.30
Analyzed values (%)				
Crude protein	23.40	23.35	23.50	23.60
Crude fiber	4.40	4.30	3.85	4.13
Calculated values (%)				
ME (kcal/kg)	2827.46	2812.50	2797.54	2782.58
Crude protein (%)	22.32	22.36	22.39	22.43
Crude fiber (%)	4.13	4.10	4.08	4.05
Fat (%)	3.58	3.66	3.73	3.80
Lysine (%)	1.21	1.20	1.19	1.17
Methionine (%)	0.49	0.48	0.48	0.48
Calcium (%)	1.69	1.69	1.69	1.69
Available phosphorus (%)	0.55	0.54	0.54	0.54

D1 = control diet, 0.0% level of *Ipomoea asarifolia* leaf powder addition, D2 = 0.8% level of *Ipomoea asarifolia* leaf powder addition, D3 = 1.6% level of *Ipomoea asarifolia* leaf powder addition, D4 = 2.4% level of *Ipomoea asarifolia* leaf powder addition

Table 2. Composition of experimental diets for broiler finisher(g/100g)

Ingredients %	D1	D2	D3	D4
Maize	60.80	60.80	60.80	60.80
Soybean meal	29.00	29.00	29.00	29.00
Wheat bran	7.00	6.20	5.40	4.60
<i>Ipomoea asarifolia</i> leaf meal	-	0.80	1.60	2.40
Bone meal	1.50	1.50	1.50	1.50
Limestone	1.00	1.00	1.00	1.00
Lysine	0.05	0.05	0.05	0.05
Methionine	0.20	0.20	0.20	0.20
Broiler premix	0.25	0.25	0.25	0.25
Salt	0.20	0.20	0.20	0.20
Analyzed values (%)				
Crude protein	19.70	20.40	21.70	21.20
Crude fiber	4.10	3.70	3.50	3.60
Calculated values (%)				
ME (kcal/kg)	3001.77	2986.81	2971.85	2956.89
Crude protein (%)	20.03	20.07	20.10	20.14
Crude fiber (%)	3.70	3.67	3.65	3.62
Fat (%)	3.69	3.77	3.84	3.91
Lysine (%)	1.07	1.07	1.06	1.05
Methionine (%)	0.50	0.50	0.49	0.49
Calcium (%)	0.98	0.98	0.97	0.97
Available phosphorus (%)	0.47	0.47	0.47	0.47

D1 = control diet, 0.0% level of *Ipomoea asarifolia* leaf powder addition, D2 = 0.8% level of *Ipomoea asarifolia* leaf powder addition, D3 = 1.6% level of *Ipomoea asarifolia* leaf powder addition, D4 = 2.4% level of *Ipomoea asarifolia* leaf powder addition

Table 3. Carcass traits of broiler chicken fed *Ipomoea asarifolia* nutritional-based diets

Indices	D1	D2	D3	D4	SEM ($\pm$)	<i>p</i> -value
Live weight (g)	1354.50	1321.75	1290.50	1285.00	30.11	0.81
Eviscerated weight (%)	76.88	76.07	73.20	76.65	0.64	0.15
Dressing weight (%)	69.49 ^a	68.22 ^{ab}	64.91 ^b	68.62 ^{ab}	0.66	0.05
Head (g)	37.25	40.25	36.00	37.00	0.91	0.42
Neck (g)	72.75	62.00	61.00	66.25	2.72	0.44
Breast (g)	259.75	230.00	211.25	215.25	8.16	0.13
Back (g)	192.00	190.25	165.00	188.00	4.83	0.16
Wing (g)	114.25	118.25	113.75	114.25	2.59	0.94
Shank (g)	60.75	64.25	70.00	65.00	1.82	0.38
Thigh (g)	138.75	135.00	135.25	119.00	3.95	0.31
Drumstick (g)	149.75	134.25	130.25	148.00	4.32	0.30
Abdominal fat (g)	10.75	9.75	4.00	8.00	1.33	0.31

Mean values on the same line with different superscripts are substantially ($p < 0.05$) different
D1 = control diet, 0.0% level of *Ipomoea asarifolia* leaf powder addition, D2 = 0.8% level of *Ipomoea asarifolia* leaf powder addition, D3 = 1.6% level of *Ipomoea asarifolia* leaf powder addition, D4 = 2.4% level of *Ipomoea asarifolia* leaf powder addition, SEM = Standard Error of Means

Table 4. Relative organ weights of broiler chicken fed *Ipomoea asarifolia* nutritional-based diets

Indices	D1	D2	D3	D4	SEM ($\pm$)	<i>p</i> -value
Lungs (g/kg)	0.61 ^{ab}	0.67 ^{ab}	0.52 ^b	0.76 ^a	0.03	0.01
Gizzard (g/kg)	3.00	3.15	3.80	3.50	0.14	0.15
Liver (g/kg)	2.34 ^{ab}	1.98 ^b	2.37 ^a	2.27 ^{ab}	0.06	0.04
Kidney (g/kg)	0.57	0.56	0.48	0.61	0.03	0.39
Spleen (g/kg)	0.15 ^{ab}	0.08 ^b	0.14 ^{ab}	0.16 ^a	0.01	0.03
Heart (g/kg)	0.50	0.64	0.67	0.57	0.03	0.16
Pancreas (g/kg)	0.28	0.31	0.39	0.33	0.02	0.07

Mean values on the same line with different superscripts are substantially ($p < 0.05$) different
D1 = control diet, 0.0% level of *Ipomoea asarifolia* leaf powder addition, D2 = 0.8% level of *Ipomoea asarifolia* leaf powder addition, D3 = 1.6% level of *Ipomoea asarifolia* leaf powder addition, D4 = 2.4% level of *Ipomoea asarifolia* leaf powder addition, SEM = Standard Error of Means