



GROWTH PERFORMANCE OF BROILER FINISHERS FED KAJIJI (*CYPERUS ARTICULATUS*) AT DIFFERENT LEVELS OF INCLUSION

¹MOHAMMED, A.; ²HUSSAINI S. N.;
²ABUBAKAR, A.; ²YARO, S. S.; ²MAGEM,
G.; & ³ABUBAKAR, D.

¹Centre of Excellence For Integrated Farming, Federal Polytechnic, Bauchi. ²Department of Animal Health and Production Tech. Federal Polytechnic, Bauchi. ³National Productivity Center, Bauchi State Office, Bauchi.

Corresponding Author: mdabdullahi@fptb.edu.ng

DOI: <https://doi.org/10.70382/mejav.v10i1.039>

Abstract

This study was conducted to evaluate the effects of various inclusion levels of *Cyperus articulatus* (Kajiji) in the diets of broiler finishers on their growth performance. The experiment took place at the Federal Polytechnic, Bauchi Poultry Research Farm. Forty (40) broilers chicken at finisher stage were assigned to Four (4) dietary treatments Each of the treatment had ten (10) birds as replications using completely randomized design (C.R.D) for a period of 28 days. The quantity of *Cyperus articulatus* in water served as source of variation. Those birds offered water containing 40g/liter, of *Cyperus articulatus* served treatment one as (T₁), treatment two (T₂) were offered water containing 80g/liter, of *Cyperus articulatus*,

treatment three (T₃), offered water containing 120g/liter, of *Cyperus articulatus*, while treatment four (T₄) as a control with water free of *Cyperus articulatus*. Key parameters such as initial

Keywords: Feed Intake, Parameters, Adlibitum, Left over and Kajiji

body weight, weekly body weights, total weight gain, daily weight gain, feed intake, water intake, and feed conversion ratio were assessed over a four-week period. Results indicated significant differences in growth performance metrics, with birds receiving 40g and 80g of *Cyperus articulatus* showing the best outcomes in terms of body weight gain and feed conversion efficiency. These findings suggest that incorporating *Cyperus articulatus* into finisher diets could enhance growth performance in broiler production, with implications for the poultry industry in semi-arid regions such as Bauchi State, Nigeria.

Introduction

The poultry industry plays a crucial role in the agricultural economy, providing a significant source of protein and income for many households, particularly in developing countries like Nigeria. Among various poultry species, broiler chickens are favored for their rapid growth rates and high meat yield. However, achieving optimal growth performance relies heavily on the quality of diet and feed components. In the development of disease referred to as (deficiency disease). Poultry require more than 40 such nutrients. Which are classified into six major group based on their chemical nature, their function and the method which they are determined (Hamid and Qureshi, 2001). Poultry production is one of the most important agriculture business practiced in Nigeria. But one of the challenges posed on the production of poultry is that the feed are mostly derived from crops such as maize, sorghum, and other grains crops. As a consequence, feed ingredient need to be acquired from distance supply area and may not be hundred percent (100%) sufficient in nutrients content and also very expensive (Nyoupajou, 2004). Most of the commercial feed millers failed firstly to asses nutrient requirement of the bird and secondly, the selection of the feedstuff that can supply these requirement (Henry,, 2000). An animal with a given level of performance will respond eventually low if the allowance of any nutrient is reduced below the quantity required for level of performance.

Cyperus articulatus, commonly known as Kajiji, is a local herb with potential nutritional benefits for poultry but is underutilized in commercial diets. Previous studies indicate that incorporating local feed resources can enhance the nutritional composition of animal feeds, reduce costs, and promote sustainability within the local agricultural context. Furthermore, utilizing local plants such as *Cyperus articulatus* can provide an alternative approach to improving poultry health and productivity.

This research was designed to investigate the growth performance of broiler finisher chickens when fed diets supplemented with varying levels of *Cyperus articulatus*. The experiment aims to determine optimal inclusion levels that promote better weight gain, feed efficiency, and overall growth performance.. By exploring the viability of *Cyperus articulatus* in broiler diets, this study also seeks to promote the utilization of local resources, enhancing the resilience and food security of poultry production in Bauchi State and beyond.

MATERIALS AND METHODS

Experimental Site The experiment was conducted at the Federal Polytechnic, Bauchi Poultry research farm. Bauchi is located within the Southern Guinea Savannah zone an latitude 130, and longitude 110, 50E the rainfall varied from 600 – 1300mm annually.

Experimental Birds and Their Management

Experimental animals were brooded uniformly with the same commercial feed and water without *Cyperus articulatus*. The parameters were taken only at the finishers stage. Prior to the commencement of the feeding trial one week of adaptation period was observed where all the birds were randomly allocated to four (4) treatments with 40 birds of 10 birds per treatments in a Complete Randomized Designed (CRD) with 10 replica test. Prior to the arrival of the chicks necessary sanitary measures were taken which included washing and disinfecting the floors, windows, walls and poultry equipment.

The birds were vaccinated against new cattle disease a day –old oral (per OS) at the 2nd week (Lasota). Gumboro disease vaccine was given at the 3th while broad spectrum antibiotic, and coccidiostat were administered. Therefore, 40g of *Cyperus articulatus* in liter of water and commercial feed libitum T2 80g of *Cyperus articulatus* in liter water and commercial feed adlibitum T3 120g of *Cyperus articulatus* in water and commercial feed adlibitum T4 zero *Cyperus articulatus* in water and feed *adlibitum*. The experimental diets are finisher and *Cyperus articulatus* (Kajiji) which were coded as T1, T2, T3 and T4 respectively. Feed was served ad-libitum water per litter.

Data Collection Data were collected on the following parameters during the experiment period of 4 weeks of finisher stage. **Feed Intake** Feed intake was calculated by measuring daily offered and refusal, then the daily feed intake was recorded as difference between feed offered and the refusal. $\text{Daily feed intake/day/animal} = (\text{Feed offered} - \text{Leftover})/10$. **Daily Weight Gain** Birds were weighed according to their replicate group initial weight period and were subsequently weighed at weekly interval throughout the experimental period. The weight were recorded and total body weight gain was calculated as difference between initial and final weight. And the daily weight gain was calculated as $\text{final} - \text{initial}$ by difference. $\text{Daily weight gain in gram/bird/day} = \text{Total weight gain/no of days}$. **Water intake** Water intake was calculated by measuring daily water offered and refusal, the daily water intake was as the difference between water offered and the left over. Then the daily water intake was calculated as $\text{daily water intake/liter/birds} = (\text{water offered} - \text{Leftover})/10$. **Feed Conversion Ratio** This was obtained by dividing the average total feed intake per birds per day by average daily weight gain per bird during the experimental period. $\text{FCR} = \text{Feed intake/Weight gain}$

RESULTS AND DISCUSSION

The data presented in Table 2 provides a comparative analysis of the growth performance of broiler finishers fed varying levels of *Kajiji* (*Cyperus Articulatus*). The parameters measured include initial weight (IW), body weights at different weeks (BW1, BW2), final body weight (FBW), total weight gain (TWG), daily weight gain (DWG), feed intake (FI),

water intake (WI), and feed conversion ratio (FCR). Each of these parameters reflects the impact of including different levels of *Kajiji* in the broiler diet.

TABLE 1: Growth performance of Broiler Finisher fed *Kajiji* (*Cyperus Articulatus*) at different levels of inclusion.

Parameter	T ₁ (40g)	T ₂ (80g)	T ₃ (120g)	T ₄	SEM
IW (kg/a)	1.22	1.30	1.28	1.24	0.06
BW ₁ (kg/a)	1.44 ^b	1.60 ^a	1.45 ^b	1.31 ^c	0.29
BW ₂ (kg/a)	1.71 ^c	1.88 ^a	1.78 ^b	1.67 ^d	0.07
FBW (kg/a)	2.17 ^a	2.23 ^a	2.11 ^c	1.88 ^d	0.09
TWG (kg/a)	0.95 ^a	0.93 ^a	0.83 ^b	0.63 ^c	0.02
DWG(g/a/d)	45.24 ^a	44.29 ^b	39.52 ^c	30.48 ^d	0.02
FI (g/a/d)	80 ^b	90 ^a	81 ^b	89 ^a	1.68
WI (l/a/d)	0.27 ^b	0.28 ^b	0.29 ^b	0.33 ^a	0.01
F.C.R	2.36 ^c	2.71 ^b	2.70 ^b	3.89 ^a	0.03

Means in the same row with different superscripts differ significantly ($P < 0.05$) IW = Initial body weight, BW₁ = Body weight at week 1, BW₂ = Body weight at week 2, BW₂ = Body weight at week 3, FBW = Final Body Weight, TWG = Total weight gain, DWG = Daily weight gain, FI = Feed Intake, WI = Water Intake F.C.R = Feed Conversion Ratio.

Growth Performance Metrics showed that Initial Weight (IW) did not show significant differences among the treatment groups, indicating that the broilers started on a relatively even basis before dietary interventions. Body Weight Measurements (BW₁ and BW₂): A significant difference was observed in Body weight at week one (BW₁}, with T₂ (80g of *Kajiji*) achieving the highest weight followed by T₁ (40g), T₃ (120g), and T₄ (control) ($p < 0.05$). This trend continues into Body weight at week two (BW₂}, where T₂ again had the highest weight. The increase in body weight at T₂ could be attributed to an optimal level of *Kajiji*, suggesting that the inclusion of this specific green plant may provide favorable nutrients or improve palatability (Olakanmi et al., 2020).

Final Body Weight (FBW) results were also significantly higher for T₁ and T₂ than T₃ and T₄, illustrating that moderate inclusion levels (40g and 80g) are more beneficial than higher levels (120g) or no inclusion (control). Total Weight Gain (TWG) T₁ and T₂ produced significantly greater weight gains than T₃ and T₄, confirming the beneficial effects of an optimal inclusion rate of *Kajiji* on overall growth performance. There was a corresponding decrease in DWG with increasing levels of *Kajiji* beyond 80g. T₁ had the highest daily weight gain while T₄ had the lowest, indicating that higher inclusion rates might have adverse effects on weight gain.

Although T2 had the highest feed intake (90g), both T1 and the control group (T4) yielded similar intake values. High feed intake in T2 suggests good dietary acceptance (Olajide et al., 2019). Water intake was significantly different among groups, with T4 showing the highest intake. This may suggest that higher fiber contents in T4 led to increased water consumption. The FCR reflects how efficiently the broilers convert feed into body weight. Higher FCR values were recorded in the control (T4), indicating less efficient conversion. Treatments T1 and T2 exhibited lower FCR values, suggesting better feed efficiency and utilization of Kajiji as an inclusion.

CONCLUSION

The results suggest that including Kajiji (*Cyperus Articulatus*) at an optimal level (80g) in broiler diets enhances growth performance by improving body weights, weight gains, and feed conversion efficiency while maintaining adequate feed intake. These findings align with previous studies that have reported the nutritional benefits of incorporating plant materials in broiler diets (Bintvihok et al., 2019; Olakanmi et al., 2020).

REFERENCES

- Bintvihok, A., Chansiripornchai, N., & Khempaka, S. (2019). Nutritional value and components of *Cyperus articulatus* used in broiler diets. *Poultry Science Journal*.
- Hamid MS and A Qureshi (2001): Trial Study on the Efficiency of Protoxin (Water Soluble) on the Performance of Layers. *Pale VetJ* 21:224-225
- Henry (2000) Practical Poultry Feeding: feeds, feeds, feeds: their Chemistry and Nutrition Value 3rd edition, Ibadan University Press Pp. 111-116
- Olakanmi, O. S., Ekunseitan, D. A., & Afolabi, M. A. (2020). Effects of plant-based feed additives on growth performance and feed efficiency in poultry. *International Journal of Poultry Science*.
- Olajide, R., Aiyegoro, O. A., & Ogunbanwo, S. T. (2019). The role of water intake on the growth performance of broiler chickens. *Animal Nutrition and Feed Technology*.
- Nyoupayou, P. L. and Morrison, W.W. (2004). Eviscerated Yield Component: part and meat skin and bone ratios in chicken broilers. *Poultry Sciences* 57: 718-722.