

INFLUENCE OF *TETRAPLEURA TETRAPTERA* AS ADDITIVE ON GROWTH PERFORMANCE OF BROILER CHICKENS

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ABSTRACT

This study was conducted to assess the influence of dietary inclusion of *Tetrapleura tetraptera* in drinking water on growth performance of broiler chicken. A total of Two-hundred-day old broiler chicks were used. There were five (5) dietary treatments. T1 0.00g/litre (control) contained no *Tetrapleura tetraptera*, T2-T5 contained 0.25g/litres, 0.50g/litres, 0.75g/litres and 1.00g/litres of *Tetrapleura tetraptera* respectively. Each treatment was replicated four (4) times with each replicate having 10 birds in a complete randomized design (CRD). Feed and water were given *ad libitum* for the duration of the experiment and the experiment lasted for 7 weeks. Results revealed that feed intake of birds on diet 3 (67.79g/bird/day) and diet 4 (66.41g/bird/day) were similar ($P > 0.05$) statistically. Similarly, weight gains of birds on diet 3 (29.48g/bird), diet 4 (26.39g/bird) and diet 5 (26.97g/bird) were similar ($P > 0.05$) statistically, diet 1 (25.58g/bird), diet 2 (24.60g/bird), diet 4 (26.39g/bird) and diet 5 (26.97g/bird) were also similar ($P > 0.05$) statistically but bird on diet 3 (29.48g/bird) had a higher weight gain which resulted in a significantly higher final body weight. The overall result shows that birds on diet 3 (0.50g/litres of *Tetrapleura tetraptera*) had significantly superior body weight gain and final body weight than birds on diet 1 (0.00g/litre), diet 2 (0.25g/litres), diet 4 (0.75g/litres) and diet 5 (1.00g/litre) of *Tetrapleura tetraptera* respectively. The study could be concluded that 0.50g/litres of *Tetrapleura tetraptera* in drinking water could be used to improve the growth performance to produce antibiotics residues free chicken meat.

Key Words: Broilers chicken, Growth performance, Additive, *Tetrapleura tetraptera*

INTRODUCTION

The importance of edible plants and their roles in improving human health cannot over emphasize (Okpuzor *et al*, 2008). According to (Akubugwo and Ugbogu, 2007), trees and shrubs with nutritional and medicinal potentials abound in Nigeria. Many of these trees and shrubs are eaten and as well used as medicinal recipe against diseases (Akubugwo and Ugbogu, 2007). *Tetrapleura tetraptera* is among such trees and shrubs which possess bioactive compounds that exhibit physiological activity against bacteria and other microorganisms. The Survival of the poultry in most developing countries in the future will undoubtedly depend on the ability of poultry to compete with humans for the available food supply. Feed account for 60-80% of the total cost of production in the livestock industry. Broiler is a type of chicken (*Gallus domesticus*) raised specifically for meat production. Interestingly, most of these plants are used in our everyday cooking as herbs, spices, seasonings and preservatives. But the truth is that we often consume most of these essential medicinal plants in the form of spices without even acknowledging what our bodies gain from them. Furthermore, the use of these medicinal plants as food, preservatives, spices and as instrument for preventing and tackling the development of microorganisms in human bodies has become an area of extensive studies. One of such valuable medicinal plants is Aridan. African Porridge Fruit (*Tetrapleura tetraptera*) is from the family of Mimosaceae. It is locally known in all the parts of Nigeria. It possesses a fragrant and characteristically pungent aromatic odour which is attributed *Tetrapleura tetraptera* to its insect repellent property (Aladesanmi, 2007.) The fruit has both nutritional and therapeutic attribute to man. This study is therefore to assess the influence of *Tetrapleura tetraptera* as additive on growth performance of broiler chickens.

MATERIALS AND METHODS

The study was carried out at the Poultry Unit, Teaching and Research Farm, University of Ibadan, Ibadan, Oyo State, Nigeria. A total of two-hundred-day old unsexed Arbor Acre broiler chicks were obtained from CHI Ajanla, Ibadan, Oyo State. They were divided into five groups comprising of 40 birds in a completely randomized design. Each group was further sub-divided into 4 groups of 10 birds which serve as replicates. The dry fruit of *Tetrapleura tetraptera* were obtained from Oje market in Ibadan, Oyo state. The fruit collected over time were washed with clean water to remove any foreign matter and sun-dried and were broken using knife and milled into fine powder and included into the water. Pen was well prepared before the arrival of birds. The weight of animal were taken at the beginning and at the end of the 49-days, feed intake were also measured. The *Tetrapleura tetraptera* were added in drinking water as follows 0.00g/litre, 0.25g/litre, 0.50g/litre, 0.75g/litre, and 1.00g/litre for T1, T2, T3, T4 and T5 respectively. The *Tetrapleura tetraptera* were mixed thoroughly every day and were left inside water for 24 hours before giving the animal. Feed and water were given *ad libitum*.

Data Collection and Statistical analysis

Initial and final weights of the birds were taken at the beginning and at the end of the experiment. Weight gain, feed intake, feed conversion ratio and water intake were computed. All data obtained were subjected to statistical analysis using one-way analysis of variance (ANOVA) and means were separated using Duncan Multiple Range Test at significance level of $P < 0.05$

Table 1: Composition of Experimental Diets for Broiler Chickens

INGREDIENTS g/kg	Starter	Finisher
Maize	55.40	56.40
Soya bean meal	38.00	36.78
Fish Meal	2.50	2.44
Wheat offal	0.80	1.08
Dicalcium phosphate	1.50	1.50
Premixes	0.25	0.25
Limestone	0.80	0.80
D-L Methionine	0.25	0.25
L-Lysine	0.25	0.25
Table salt	0.25	0.25
TOTAL	100.00	100.00
Calculated Values		
Crude protein g/kg	23.14	20.00
Energy ME, Kcal/kg	3014.90	3000.00
Crude Fibre g/kg	0.40	0.51
Calcium/kg	0.87	0.95
Total phosphorus/kg	0.73	0.85

RESULTS AND DISCUSSION

The influence of *Tetrapleura tetraptera* inclusion in the diet of broiler chickens on feed intake, weight gain, feed conversion ratio, are presented in the table 2 below. There were no significant ($P > 0.05$) difference among treatment in initial body weight, while there were significant ($P < 0.05$) differences in final body weight, weight gain, feed intake, feed conversion ratio and water intake. The final body weight of broiler chicken that received T3 was the higher than that of those receiving T1 and T2. This result confirmed the findings of (Ndelekwute 2016) who reported a significant difference in the final body weight of broiler fed *T. tetraptera* across the treatments. This result was in line with the findings of (Kana 2017) who reported a significant difference in the weight gain of broiler fed *T. tetraptera* across the treatments. This result disagreed with the finding of (Kana 2017) who noticed a decrease in the weight gain of broiler fed *T. tetraptera* across the treatments. Furthermore, the result of (Ndelekwute 2016) who reported a decrease in the weight gain of broiler fed *T. tetraptera* across the treatments also negates the findings of this study. The feed intake was significantly difference across the dietary treatment. This result negates the findings of (Ndelekwute 2016) who reported no significant difference in the feed intake of broiler fed *T. tetraptera*. However, the result of this study confirmed the findings of the (Kana 2017) who reported a significant difference in the feed intake of broiler fed *T. tetraptera* across the treatment. This result negates the findings of (Nweze and

Nawankwagu 2011) who noticed a reduction in feed intake of broiler chicken fed *T. tetraptera* in water. The reduction in feed intake could be due to *T. tetraptera* odour which might have negatively affected appetibility of broiler chicken. The values recorded for feed conversion ratio (FCR) were significantly difference across the dietary treatment. This result was in line with the findings of (Kana 2017) who reported a significant difference in the FCR of broiler fed with *T. tetraptera* across the dietary treatment.. It was discovered that the lowest FCR resulted in the highest weight gain in broiler fed 0.50g/litre of *T. tetraptera*. This result confirmed the finding of (Windisch *et al* 2008) who reported that lower FCR is related to higher weight gain values in birds fed 0.2% of *T. tetraptera*. This higher weight gain was due to phytochemicals increased stabilization of intestinal health, animals are less exposed to microbial toxins and other undesired microbial metabolites such ammonia and biogenic amines. As a result, animals are relatively relieved from immune defense stress during critical situations and there is increase availability of essential nutrients for absorption, thereby helping the animals to grow better within the frame work of their genetic potentials. (Ndelekwute 2016) reported the lowest FCR in control diet (T1). This result negates the finding of this study, in which the lowest FCR was noticed with the broiler fed 0.50g/litre of *T. tetraptera*

Table 2: Growth performance of broiler fed *Tetrapleura tetraptera*

Parameters	T1	T2	T3	T4	T5	SEM
IBW(g/bird)	112.50	111.30	117.50	113.30	112.50	1.00
FBW(g/bird)	1365.94 ^b	1316.82 ^b	1561.91 ^a	1406.36 ^{ab}	1434.12 ^{ab}	0.09
Daily Weight Gain (g/bird)	25.58 ^b	24.60 ^b	29.48 ^a	26.39 ^{ab}	26.97 ^{ab}	0.74
Feed Intake (g/bird)	3625.38 ^a	3458.43 ^{ab}	3321.70 ^c	3253.86 ^c	3441.25 ^{ab}	142.63
Daily Feed Intake (g/bird)	73.99 ^a	70.58 ^{ab}	67.79 ^c	66.41 ^c	66.23 ^{ab}	1.16
FCR	2.89 ^a	2.87 ^{ab}	2.30 ^d	2.52 ^{cd}	2.60 ^{bc}	0.03
Water Intake /day/bird(ml)	31.22 ^{ab}	31.43 ^{ab}	33.27 ^a	31.63 ^{ab}	30.61 ^b	0.39

^{abcd}: Mean along the row with the same superscript are not significantly ($P>0.05$) different from each

other IBW: Initial body weight, FBW: Final body weight, WTG: Weight gain, FCR: Feed conversion ratio, WI: Water intake

CONCLUSION AND RECOMMENDATION

From the result obtained in this study, it could be concluded that 0.50g/litres of *Tetrapleura tetraptera* in drinking water could be used to improve the growth performance to produce antibiotics residue free chicken meat. It could be recommended that, the extension agents are therefore expected to encourage the farmers to adopt the use of *Tetrapleura tetraptera* in place of antibiotic as this will increase the growth rate and hence increase the profitability of the farmer.

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