

PERFORMANCE CHARACTERISTICS OF BOILER CHICKENS FED DIET CONTAINING DIFFERENT OIL TYPES.

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ABSTRACT

This study was carried out at the poultry unit of the Teaching and Research Farm, Department of Animal Production, Federal University of Technology Minna, Nigeria. A Total number of 180 day old chicks were used for the experiment. The birds were randomly allotted into five treatment of three replicate consisting of 12 birds in a complete randomized design (CRD). T₁ (birds fed control diet), T₂ (were birds fed 4% palm oil), T₃ (were birds fed 4% palm kernel oil), T₄ (were bird fed 4% ground nut oil) and T₅ (were bird fed 4% shea butter oil). The experiment lasted for 8 weeks. The result showed that at starter phase the final weight, body weight gained and feed intake were influenced ($P < 0.05$) by the inclusion of oils while feed conversion ratio, protein and energy efficiency ratio were not significantly affected ($P > 0.05$). The inclusion of 4% groundnut oil and shea butter oil (T₄ and T₅) showed significantly better growth performance in terms of final weight (214.43g) and (237.43g) compare to T₃ (203.0g). At the finisher phase no significant ($P > 0.05$) difference was recorded in final weight, body weight gain, feed conversion ratio, protein and energy efficiency ratio with exception of the average feed intake which was significantly ($P < 0.05$) affected by the inclusion of oils, with control and treatment T₅ showed best result (488.15g) and (453.74g) compare to those in treatment 3 and 4 (418.06g) and (441.96g). It can therefore be concluded that broiler chicken could tolerate 4% inclusion level of the various types of oil used in this research work without any adverse effect on their growth performance.

Key Words: Broiler chicken, palm oil, palm kernel oil, groundnut oil and shea butter oil.

INTRODUCTION

Poultry feeding is one of the most important aspect of production because feed cost alone account for 65 - 75% of the total cost of egg and meat production (McNab, 1999). Therefore, for profitable poultry rearing, provision of economical and balance diet is must. Use of oil as a source of energy on broiler fed has many advantages such as increasing the energy content of diet, addition of oil in broiler diet also provides increase growth rate, increase rate of gain, increases feed efficiency and also minimized the dustiness of feeds. Poultry farmers in Nigeria continue to experience a rise in the production cost due to the continuous increase in feed cost. (Ajighjigh *et al.*, 2018). The insufficient know – how and the lack of alternatives and a more cost efficient feed stuff as well as the struggle between man and animals for most traditional feed stuff has been established as the main cause of increase in cost of production (Afolayan *et al.*, 2012). This current study was therefore carried out to examine the effect of supplementing broiler chickens diets with different oil types at the same level of inclusion on the performance of broiler chickens.

MATERIALS AND METHODS

The research was conducted at Teaching and Research Farm, Federal University of Technology Minna, Gidan Kwano Campus Niger State. Minna located within the Latitude 09° 31' 18.2"N and Longitude 6° 27' 40'E with an elevation that ranges from 230 – 250 m. The area of study lies within the Southern Guinea Savanna of Nigeria. The sub humid climate of the region has an average yearly rainfall of 1338mm, dry season of about 5 month and average temperature of about 30° c (FUTMIN, 2012). A total of 180 day old Ross 308 chicks were sourced from Agrited Farm Limited Ibadan, Oyo State and were used for the study. Five (5) nitrogenous and isocaloric diets were formulated using different oil types at 4% inclusion levels T₁ (0% oil), T₂ (4% palm oil), T₃ (4% palm Kernel oil), T₄ (4% groundnut oil) and T₅ (4% shea butter oil). The birds were randomly allotted to the treatment groups Each treatment was assigned 36 birds with three replicate of 12 birds in a complete randomized design (CRD) arrangement and The experiments lasted for eight (8) weeks.

RESULTS AND DISCUSSION

At the starter phase (table I) the result showed no significant difference ($P > 0.05$) in initial body weight, protein and energy efficiency ratio and feed conversion ratio. The birds fed 4% shea butter oil (T₅) showed significance difference ($P < 0.05$) over those fed 4% palm kernel oil (T₃) in the body

weight gain (155.97g) and average daily body weight gain (5.57g) but (T₅) 4 % shea butter oil was statistically the same with control (T₁) and those fed 4% groundnut oil (T₄). This result agree with the report of Harms *et al.*, (2000) who reported that addition of 3% - 6% shea butter oil in broiler diet increases growth performance.

There was no significance different ($P>0.05$) between T₂ and T₅ in (Table 1) with reference to body weight gain, this agree with Ayed *et al.*, (2015) who reported that addition of palm oil to broiler diet increases their body weight gain, similar report has been documented by Yamany *et al.*, (2008) that 4% inclusion of shea butter oil tend to improve weight gain in broiler chickens as reported in this experiment. There was no significance difference ($P>0.05$) observed at the finisher phase of the experiment in average body weight, final body weight and feed conversion ratio, the only difference observed was at the average feed intake (Table 2) T₃, 4% palm kernel oil diet recorded the lowest value of feed intake (418.06g) which does not reflect on the feed conversion ratio. The non significance difference ($P>0.05$) observed at finisher phase may be due to ability of chickens to utilize dietary oil in diets which support the study of Firman *et al.*, (2008) who compared oils source such as soy bean oil, yellow grease and palm oil in ratio of broilers from hatch to market and reported that older chickens digest more dietary oil than the younger chickens.

It can therefore be concluded that broiler chicken could tolerate 4% inclusion level of the various types of oil used in this research work without any adverse effect on their growth performance.

Table 1: performance characteristics of broiler chickens fed diet containing different oil types at starter phase.

Parameters	TREATMENTS					SEM	LS
	T ₁	T ₂	T ₃	T ₄	T ₅		
Initial Body weight (g)	46.47	46.77	47.53	46.90	47.73	0.28	NS
Final Body Weight (g)	229.74 ^{ab}	217.70 ^{ab}	203.0 ^b	214.43 ^a	237.43 ^a	4.46	*
Body Weight Gain (g)	183.28 ^a	170.93 ^{ab}	155.97 ^b	167.20 ^{ab}	189.70 ^a	4.39	*
Average weekly body weight gain	45.82 ^a	42.73 ^{ab}	38.99 ^b	41.80 ^{ab}	47.43 ^a	1.10	*
Average daily body weight gain	6.55 ^a	6.11 ^{ab}	5.57 ^b	5.97 ^{ab}	6.77 ^a	0.16	*
Average feed intake (g)	146.06 ^b	138.80 ^{bc}	135.02 ^c	138.02 ^c	155.45 ^a	2.21	*
Feed conversion ratio (g)	3.19	3.25	3.47	3.32	3.30	0.05	NS
Protein efficiency ratio	1.48	1.49	1.39	1.46	1.47	0.02	NS
Energy efficiency ratio	0.10	0.10	0.09	0.09	0.10	0.00	NS

Key: a,b,c mean on the same row with different superscript differ significantly ($p<0.05$)

SEM = standard error of the mean, LS = Level of significance, NS = No Significance,

* = significance difference

Table 2: performance characteristic of broiler chicken feed diet containing different oil types at finisher phase.

Parameters	TREATMENTS					SEM	LS
	T ₁	T ₂	T ₃	T ₄	T ₅		
Initial Body weight (g)	229.74 ^{ab}	217.70 ^{ab}	203.50 ^b	214.10 ^{ab}	235.43 ^a	4.46	*
Final Body Weight (g)	1430.80	1522.40	1386.12	1531.47	1340.13	33.15	NS
Body Weight Gain (g)	1201.06	1304.70	1182.62	1317.37	1102.70	34.19	NS
Average weekly body weight gain	167.92	164.06	149.96	155.72	141.48	4.73	NS
Average daily body weight gain	22.99	23.44	21.42	22.24	20.21	0.68	NS
Average feed intake (g)	488.15 ^a	443.22 ^{ab}	418.06 ^b	441.96 ^b	453.74 ^{ab}	7.98	*
Feed conversion ratio (g)	2.93	2.70	2.83	2.88	3.21	0.08	NS
Protein efficiency ratio	1.72	1.90	1.83	1.81	1.60	0.05	NS
Energy efficiency ratio	0.11	0.12	0.11	0.11	0.10	0.00	NS

Key: a,b,c = mean in the same row with different superscript are significantly different (p<0.05).

CONCLUSION AND RECOMMENDATION

It can be concluded from the experiment that the inclusion of the four oil types at 4% significantly affected (p<0.05) all the growth parameters at starter phase except feed conversion ratio, protein and energy efficiency ratio. While at finisher phase the initial weight and average feed intake were significantly affected. However final weight, body weight gain, feed conversion ratio, protein and energy efficiency ratio were not significantly affected.

It can therefore be recommended that farmers can use shea butter oil at 4% inclusion in the diet of broiler chickens for better growth performance at starter phase.

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