EFFECT OF FEEDING LOW DIETARY ENERGY LEVELS ON GROWTH PERFORMANCE OF BROILER CHICKENS DURING THE FINISHER PERIOD

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ABSTRACT

This study aimed at investigating the effect of low dietary energy on growth performance of broiler chickens at finisher stage. Two hundred and twenty five, four weeks old Amok broiler chicks were weighed and allotted to three dietary treatments containing 2 400 ME Kcal/Kg, 2 600 ME Kcal/Kg and 2 800 ME Kcal/Kg designated as A, B and C, respectively. Each treatment was replicated three times with twenty-five birds per replicate. Results showed that feed in take decreases as the energy value of the feed increases. There was statistical significance ($P<0.05$) in feed in take between birds fed diets A, B and C. The weight gain values of birds fed diets B and C were statistically similar which differs with birds fed diet A. There were no statistical differences between the treatments in terms of final live weight and feed conversion ratio. The study recommended that low energy diets should be formulated for poultry so as to minimize the accumulation of cholesterol in between the muscle fibres and on visceral organs which can consequently affects the physiological and metabolic functions of the birds, organoleptic characteristics, marketability of the products and health status of the consumer.

Key words: Broiler, Diet, Energy, Performance and Finisher.

INTRODUCTION

Energy is the fuel that keeps many different body functions operating every time of the day. It is a vital feed component, a costly feed component and the most wasted of the feed components. Hence everything has to be done to enhance the utilization of the diet for productive body functions (Oluyemi and Robert, 2000). Various studies were carried out to determine the nutrient requirements of poultry broilers reared in the tropics with particular reference to Nigeria and various levels of energy and protein have been recommended. Oluyemi and Robert (2000) recommended 23 and 20% protein with same energy of 3200 ME Kcal/Kg for broilers of ages 0-4 and 5-8 weeks respectively. Ogundipe (2002) recommended protein levels of 20 and 26% and energy levels 2800 and 3200 ME Kcal/Kg diets which were used for starter and finisher phases, respectively. Corduk *et al.* (2007) found the energy 2800 ME Kcal/Kg and protein requirements in the wet tropics for starter and finisher to be 23 to 24% and 19 to 21% respectively, while Garba *et al.* (2011) recommended protein level of 22% and energy content of 2900 ME Kcal/Kg for starter broilers.

MATERIALS AND METHODS

A four week feeding trial was conducted at the poultry training and research farm of the Department of Animal Health and Production, Binyaminu Usman Polytechnic, Hadjia, Jigawa State. Two hundred and twenty five, four weeks old Amok broiler chicks were weighed and allotted to three dietary (Table 1) treatments containing 2 400 ME Kcal/Kg, 2 600 ME Kcal/Kg and 2 800 ME Kcal/Kg designated as A, B and C, respectively. Each treatment was replicated three times with twenty-five birds per replicate. Water was served freely to all the treatments. Necessary management practices were carried out and routine vaccinations and drugs were administered.

The birds initial live weight was determined and the record on daily feed intake, body weight changes and feed conversion ratio were also examined. The experiment was laid in a Completely Randomized Design. The differences between the results of the performance were tested for Analysis of Variance (ANOVA) using the General Linear Model Univariate Procedure of SPSS 16.0 and

significant differences of means were compared using LSD.

RESULTS AND DISCUSSION

Table 2 shows the growth performance of broiler chickens (at finisher phase) fed different low energy levels. The feed in take decreases as the energy value of the feed increases. There was statistical significance ($P<0.05$) in feed in take between birds fed diets A, B and C. This agrees with the report of Dairo *et al.* (2010) who reported significant difference in feed in take when broiler chickens were fed high and low energy diets. Mona and Osman (2009) and Fafiolu *et al.* (2015) also reported significant difference in feed in take among treatments when broiler birds were fed high dietary energy levels and palm-kernel extraction by-products, respectively. The significantly higher in take recorded from birds fed the least energy diet (A) could be attributed to the fact that birds under normal circumstances eat to satisfy their energy needs, thus confirming the report of Akinola and Sese (2011) who stated that feed in take in birds fed dict containing low energy concentration was higher. This is also in agreement with the findings of McDonald *et al.* (2012) who reported that most animals consumed the quantity of feed needed to satisfy their energy requirement. Feed in take in this study range from 2819.88g/b to 3600.68g/b which agrees with that reported (2800g/b to 3800g/b) by Jegede *et al.* (2016), the same authors reported final live weight range of 1 800g/b to 2 500g/b which is similar to that found in this research (2 416.70g/b to 2 493.67g/b). The finding of Oloruntola *et al.* (2016) that the final live weight range of broiler chickens is 2 081.38g/b to 2 476.28g/b is similar to what is obtained in this research. Higher values were obtained in terms of final live weight (2493.67g/b) and body weight gain (2017.38g/b) for birds fed on 2 400 ME Kcal/Kg. The weight gain values of birds fed diets B and C were statistically similar which differs with birds fed diet A. There were no statistical differences between the treatments in terms of final live weight and feed conversion ratio. Al-Athari and Watkins (1988), Abu *et al.* (2011), Fafiola *et al.* (2015) and Shittu *et al.* (2016) reported no statistical difference in feed conversion ratio of broilers,while Mona and Osman (2009), Summer (2010) and Fafiolu *et al.* (2015) reported statistical similarity in final body weight.

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Table 1. Ingredients and Calculated Chemical Analysis (%) of Broiler Finisher Diet

Ingredient	Energy Levels(Kcal/ME/kg)		
	A	B	C
Maize	30.00	40.00	51.00
SBM	18.00	17.00	24.00
GNC	7.00	10.00	8.00
W/Offal	39.00	27.00	11.00
Bone Meal	3.00	3.00	3.00
Limestone	2.00	2.00	2.00
Salt	0.30	0.30	0.30
Premix	0.25	0.25	0.25
Methionine	0.25	0.25	0.25
Lysine	0.20	0.20	0.20
Total	100.00	100.00	100.00
Calculated Analysis			
ME(Kcal/KgDM)	2430	2602	2816
Crude Protein	19.8	19.7	20.2
Lysine	1.2	1.1	1.2
Methionine	0.5	0.5	0.5
Calcium	1.6	1.6	1.6
Phosphorus	0.7	0.6	0.6
Crude Fibre	5.4	4.7	3.9
Ether Extract	3.6	3.7	3.7

Table 2: Growth Performance of Broiler Chickens (at Finisher Phase) fed Different Low Energy Levels

Parameters	Energy Levels (ME kcal/kg)			S.E
	2400 (A)	2600 (B)	2800 (C)	
Initial Live Weight (g/b)	738.64	724.28	686.38	57.14
Final Live Weight (g/b)	2493.67	2416.70	2480.50	53.63
Total Feed Intake (g/b)	3600.68^{a}	3095.77^{b}	2819.88^{c}	56.00
Body Weight Gain (g/b)	2017.38^{a}	1908.64^{b}	2009.35^{b}	10.98
Feed Conversion Ratio	2.29	2.06	1.97	52.33
Feed Conversion Efficiency	0.00	0.00	0.01	0.00
Mortality (%)	0.23^{a}	0.08^{b}	0.17^{a}	0.47

^{abc} means along the same row having different superscript are significantly ($P<0.05$) different