

## Original Research

# Performance Characteristics of Noiler Birds Fed Different Levels of Protein in Semi-arid Environment

Musa, S.B.<sup>1</sup>, Veronica, A. O.<sup>2</sup>, and Garba, S.<sup>2</sup>

<sup>1</sup>Department of Animal Health and Production, School Agriculture, Binyaminu Usman Polytechnic, Hadejia, Jigawa State, Nigeria.

<sup>2</sup>Department of Animal science, Usmanu Danfodiyo University, PMB 2346, Sokoto, Nigeria.

Corresponding Author E-mail: [sanigarba2003@yahoo.com](mailto:sanigarba2003@yahoo.com); [sanigarba2012@gmail.com](mailto:sanigarba2012@gmail.com)

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**ABSTRACT:** The experiment aimed to assess the impact of varying levels of dietary protein on the performance of Noiler Chickens. A total of 120 day-old Noiler birds were randomly assigned to diets with protein levels of 21%, 22%, 23%, and 24% during the starter phase, and 16%, 17%, 18%, and 19% during the finisher phase. The diets were iso-caloric, providing 2900 kcal of ME/kg at the starter phase and 2800 kcal of ME/kg at the finisher phase. Throughout the 10-week study period, ad libitum access to feed and water was provided. The results indicated that feed intake, body weight, body weight gain, and feed conversion ratio did not exhibit significant differences ( $P>0.05$ ) across the different dietary protein levels during both the starter and finisher phases. Consequently, it can be inferred from this study that the performance characteristics of Noiler birds in a semi-arid region were not significantly influenced by the varying levels of dietary protein.

**Keywords:** Performance, Noiler birds, semi-arid, Nigeria

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## INTRODUCTION

Poultry refers to all domesticated birds that are kept for their meat, eggs, income generation or for other things like research or as pets. These groups of animals are guinea fowls, ducks, geese, turkey, peacocks etc. These groups of animals are also referred to as monogastric (non-ruminant) animals because of their single stomach compartment and hence their inability to digest large quantity of feed that are high fibre (Oluyemi and Roberts, 2000). Raising chicken is becoming a fast growing agribusiness, the increase in global population has deemed it fit for a close increase in food production, hence several means must be devised to ensure even and regular supply of food for the population (Abdulquadri, 2019). Poultry production is fast rising in Nigeria as the demand for animal protein by people is growing on a daily basis. Small and large scale farmers keep birds for two

purposes; meat and egg production. Egg and meat are rich sources of animal protein and can fight off the problem of malnutrition in Nigeria and Africa (Abdulquadri, 2019). Noiler chicken breed is one of the breeds of poultry birds with a great prospect, raising Noiler birds is comparatively cheaper than other chickens. The demand for animal protein has globally increased. In the last five years, meat consumption has gone up satisfactory; with Noiler chicken breed, the production of animal protein is cheaper and sustainable (Abdulquadri, 2019). The study of protein level characteristic of Noiler is important. Based on the recommendation of NRC (1994), different classes of poultry have different dietary protein and energy level requirements according to a different environment. Thus, to the best of our knowledge, no work was conducted in

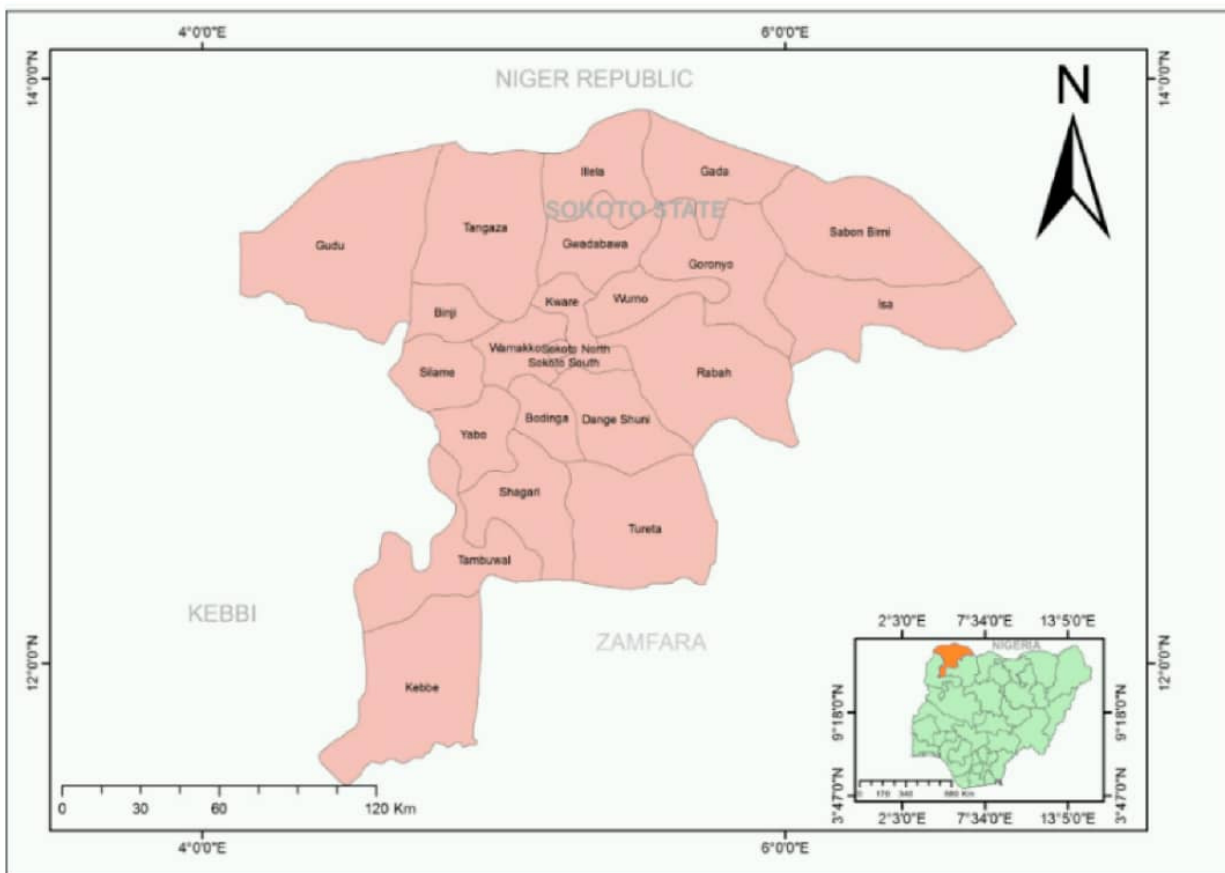


Figure 1: Location of the study area

the semi-arid region of Sokoto on dietary protein levels requirements of Noiler chicken birds. At present, there was no commercial feed for Noiler chicken in Nigeria as it is a new chicken breed to both the producers and researchers. Therefore, there is a need to develop a nutritional guide (formula) for efficiency in production and cost-effectiveness. Hence, the present study attempted to bridge the gap of the protein requirement of Noiler chicken reared in the semi-arid environment.

## MATERIALS AND METHODS

### Study location

The study was conducted in the poultry research and teaching institute of the Department of Animal Science located at State Veterinary centre, located at Aliyu Jodi road, Sokoto. Sokoto state is located at the extreme north-western part of Nigeria between longitudes  $48^{\circ}\text{E}$  and  $654^{\circ}\text{E}$  and latitudes  $12^{\circ}\text{N}$  and  $1358^{\circ}\text{N}$  (Figure 1). It shares common borders with the Niger Republic to the north, Kebbi state to the South – West and Zamfara state to the east. The total land area is about 32000sq.km.

Moreover, the state is characterized by two extreme temperatures relative to its tropical position, hot and cold seasons. The highest temperature during the hot season is experienced in March/April. Between November and February, there is the prevalence of harmattan characterized by very cold temperatures and dust-laden winds often accompanied by a thick fog of alarming intensity (Mamman *et al.*, 2000). However, the maximum daytime temperatures are generally under  $42^{\circ}\text{C}$  ( $104.0^{\circ}\text{f}$ ). The rainy season is from late May to September. Rainfall starts late and ends early with an average annual rainfall of 500mm. There are two major seasons in Sokoto state they are wet and dry season. The dry season starts from October to April in some parts and may extend to May or June in other parts. On the other hand, the wet season begins in most parts of the state in June and lasts up to September or October (SSMIYSC, 2010).

### Experimental birds and their Sources

A total of 120 day-old chicks were used for the experiment. The birds were purchased from Amo

**Table1:** Gross chemical composition of Noiler starter mash.

Ingredients	Treatments			
	T1	T2	T3	T4
Maize	39.00	40.00	41.00	42.00
Soybean meal	18.00	18.50	19.00	20.00
Groundnut cake	17.00	18.00	20.00	21.00
Wheat offal	11.00	11.00	11.00	11.00
Limestone	9.95	8.40	5.00	3.00
Bone meal	4.00	3.00	3.00	2.00
Premix	0.25	0.25	0.25	0.25
Salt	0.25	0.25	0.25	0.25
Methionine	0.25	0.25	0.25	0.25
Lysine	0.40	0.40	0.30	0.25
Total	100.00	100.00	100.00	100.00

hatchery in Oyo state, Nigeria being the breeders and most reliable source of Noiler birds in Nigeria.

### Birds and their management

The experimental birds were managed under recommended conditions for a period of 10 weeks. Feed and water were provided ad-libitum and also multi-vitamins and antibiotic were added into their water for the prevention against diseases. Vaccination was conducted against new castle diseases, infectious bronchitis and fowl pox.

### Experimental design

A total of one hundred and twenty (120) Noiler chickens were randomly allocated in a completely randomized design to 3 replicates of four dietary treatments (T1, T2, T3 and T4), with 10 birds per replicate.

### Experimental diets

Maize and groundnut cake was ground separately, bone meal was crushed, soybeans were fried to remove anti-nutritional factor before grinding to reduce the particle sizes to suit the class of birds for which the feed is to be formulated, wheat offal, limestone, lysine, methionine, premix and salt will then be incorporated into the diets according to the treatments. The Noiler chickens were fed starter mash from week one to week four (Table 1). Calculated chemical composition of Noiler starter is shown in (Table 2). However, when the birds reached five weeks finisher diet (Table 3) was fed and calculated chemical composition of Noiler finisher mash is shown in (Table 4).

### Data collection

Data on feed consumption (feed intake) was recorded on

daily basis, the body weight measurement was determined at weekly intervals. Feed conversion ratio was measured as an index of feed utilization and mortality was recorded as it occurred.

### Statistical analysis

The data were analyzed using the General Linear Model (GLM) procedure of Statistical Analysis System (SAS) package version 9.2 software (Statistical Analysis System, 2007, SAS Institute Inc., Cary, NC, USA) and statistical significance was set at  $p < 0.05$ . Significant differences between means were detected using LSD.

## RESULTS AND DISCUSSION

### Performance of experimental Noiler birds

The result on the performance of experimental Noiler birds during the starter and finisher phases is presented in (Tables 5 and 6) respectively. The result on feed intake, body weight, body weight gain and feed conversion ratio were not significantly affected by the treatments in both starter and finisher production period. Numerous researchers (Fetuga, 1984; Solangi *et al.*, 2002; Rezaei *et al.*, 2004; Roy *et al.*, 2010; Chrystal *et al.*, 2020; Morgan *et al.*, 2024) have reported significant effects of dietary protein levels. However, the results from our study are in disagreement with most of the previous works. For instance Fetuga (1984) observed that an increase in the protein level of the diet from 19% to 21% increase feed intake by broilers chickens and Smith and Pesti (1998) who also reported an increase in the protein level in the diet increase feed intake in broiler chickens. Similarly, Solangi *et al.* (2002) also reported that weight gain was responsive to dietary protein levels. Mehr *et al.* (2007) reported increased in dietary protein level significantly ( $P < 0.05$ ) increased weight gain in growing as well as the whole production period.

**Table 2:** Calculated chemical composition of Noiler starter mash.

Ingredients	Treatments			
	T1	T2	T3	T4
Energy	2611	2709	2813	2914
Protein	21.0	22.0	23.0	24.0
Lysine	1.1	1.1	1.0	1.0
Methionine	0.5	0.5	0.5	0.5
Calcium	4.6	3.8	2.7	1.7
Phosphorus	0.8	0.7	2.7	0.6
Fibre	5.7	5.9	6.1	6.1

**Table 3:** Gross chemical composition of Noiler finisher mash.

Ingredients	Treatments			
	T1	T2	T3	T4
Maize	47.00	48.00	49.50	50.50
Soybean meal	9.00	9.00	11.00	13.00
Groundnut cake	12.00	14.00	14.00	14.00
Wheat offal	12.00	12.00	12.00	12.00
Limestone	12.75	10.75	8.25	6.25
Bone meal	6.00	5.00	4.00	3.00
Premix	0.25	0.25	0.25	0.25
Salt	0.25	0.25	0.25	0.25
Methionine	0.25	0.25	0.25	0.25
Lysine	0.50	0.50	0.50	0.50
Total	100.00	100.00	100.00	100.00

**Table 4:** Calculated chemical composition of Noiler finisher mash.

Ingredients	Treatments			
	T1	T2	T3	T4
Energy	2503	2607	2709	2801
Protein	16.0	17.0	18.0	19.0
Lysine	1.0	1.0	1.0	1.1
Methionine	0.5	0.5	0.5	0.5
Calcium	6.0	5.3	3.9	3.0
Phosphorus	1.0	0.9	0.8	0.7
Fibre	4.6	4.9	5.0	5.1

**Table 5:** Performance of Noiler birds fed different levels of dietary protein at starter phase (0-4 weeks).

Parameters	Treatment				SEM
	T1	T2	T3	T4	
Feed Intake (g)	263.47	249.67	257.45	257.13	19.42
Body Weight (g)	271.86	257.39	276.53	282.44	22.10
Body Weight Gain (g)	168.58	158.08	170.13	179.03	13.62
Feed Conversion Ratio	1.59	1.63	1.56	1.55	0.06

SEM=Standard Error of Mean

Similarly, Roy *et al.* (2010) recommended that 19% crude protein diet, was the best with respect to growth, FCR and net profit for synthetic broiler (fifth generation) during growing and finisher period.

Nevertheless, the results on feed intake is in line with the earlier findings of Rahman (2001) who reported that feed consumption of synthetic broiler birds during different stages of growth and whole experimental period reduced

**Table 6:** Performance of Noiler birds fed different levels of dietary protein at finisher phase (5-10 weeks)..

Parameters	Treatments				SEM
	T1	T2	T3	T4	
Feed Intake (g)	604.18	602.28	606.42	611.00	10.12
Body Weight (g)	1307.20	1197.50	1306.50	1291.20	48.32
Body Weight Gain (g)	716.42	637.44	691.66	704.11	27.09
Feed Conversion Ratio	0.89	1.02	1.00	0.96	0.04

SEM=Standard Error of Mean

with higher level of protein but the difference was non-significant ( $p>0.05$ ).

### Conclusion

The findings of this study indicate that providing Noiler birds with varying levels of dietary protein during the starter and finisher phases does not have a significant impact ( $p>0.05$ ) on factors such as feed intake, body weight, body weight gain, and feed conversion ratio.

### Recommendation

Further research should be conducted to ascertain optimum dietary protein levels using higher dietary protein levels and longer study period to investigate the performance characteristics of Noiler chicken in the semi-arid environment.

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