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Performance of Guinea Fowl *Nuimedia meleagris* Fed Varying Protein Levels

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Abstract: 20 weeks old guinea fowl pullets previously maintained at grower phase on 4 dietary protein levels of 18, 16, 14 and 12% cp and on same metabolizable energy level of 2600 kcal kg^{-1}, were used for testing the best of performance of layers. All the birds, were then maintained on the same diet of 18% cp and metabolizable energy of 2600 kcal kg^{-1} for 16 weeks. Birds raised on 18% cp and 16% cp made their lay at 162 days old, while those on 14 cp and 12% cp made theirs at 166 and 175 days respectively. There was however, no significant difference ($p<0.05$) among the means. It took ten weeks for birds on 12% cp diet to attain 50% hen day production as compared with 8 weeks for other diets, although by the 12th week, the rate of lay evened out in all the diets. Egg production ratio was best for 16% cp being 2.8 compared with 3.0 for diet 20% cp and 3.2 for 12% cp diet. Shell thickness and yolk colour for the treatment were not significantly different.

Key words: Dietary protein, guinea fowl, feeding performance

INTRODUCTION

Apart from the high cost of feed, another problem facing poultry in the developing countries is inadequate knowledge of the nutritional requirement of the domesticated birds. It is unassailable that the Nigerian livestock industries have undergone tremendous changes over the years, but their expansion has been hampered by high cost of feed ingredients as there has been continuous competition been man and livestock for them[1] Attempts to use feed formulae based on protein and energy levels found suitable for temperate zones have not been very successful in the topics[2]. Therefore, the relatively low performance of poultry in the developing countries may not be unconnected with these problems.

Moreover, the laying performance of a bird may not only depend on the nature of its management at layer phase but also on the carry over effects of its level of nutrient intake at the starter or grower phases. Growing pullets, given varying dietary protein levels ranging from 9 to 20% showed a significantly different performance at layer phase[3]. The nutritive value of the starter and grower feeds has a significant effect on the body weight of pullets at 20 weeks. Pullets given higher protein levels at the starter and grower phases had higher body weight at 20 weeks and attain maturity earlier than those with lower dietary levels, high body weights and large egg size persisted through out the laying period[4].

It is incontrovertible that wild birds are more efficient in nutrient utilization and management. Many of them adapt easily to new environments faster and have high resistance to diseases and parasites than the domestic breeds.

Guinea fowl is a wild bird found in large numbers in the savannah forest regions of West Africa. Many of them are captured and reared in captivity by the rural duellers where they are used for enhancing the protein consumption of the people. Guinea fowl is a bird with a great potential for providing the much-needed animal protein in human diets in the developing countries. However, little information is available on its physiological and nutritional requirements

This study is aimed at examining the particular dietary protein levels at the growing phase that presents the best performance at the laying phase in guinea fowl pullets. It is hoped that the information obtained will greatly enhance guinea fowl production in Nigeria.

MATERIALS AND METHODS

240 day old guinea fowl keets randomised into four experimental diets and replicated 3 times were fed *ad libitum* at the starter and grower phases. The dietary protein levels were 24, 22, 20 and 18% cp at the starter and after 6 weeks they were moved to the grower house where the dietary protein levels were changed to 18, 16, 14 and 12% cp, respectively. The metabolised energy was 2800 Kcal kg^{-1}.

At 20weeks, 10 birds were randomly selected from each of the 4 dietary treatments and transferred into the

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layer house where they were kept one per cage. They were given the same diet at layer phase. The birds were fed *ad libitum* for 16 weeks.

RESULTS AND DISCUSSION

Table 1 shows the summary of the performance of layers fed different dietary protein during the growing phase. Birds on the 18, 16 and 14% cp had their first lay earlier than those on 14% cp diet. The mean percentage hen day production increased with the level of protein intake. Birds raised on 14 cp and 18% cp were significantly ($p<0.05$) different from each other[5].

Throughout the grower stage, there was a general increase in body weight. Weight gain increase with dietary protein intake. Birds on the lower dietary protein level had lower body weight gain Birds on 16 and 18% cp had a significantly higher body weight gain than those on lower protein diets Table 2. Ayanwale and Gado[6] reported a higher dietary protein level than those growers on 14 and 9% cp diets. The higher efficiency of feed utilization of birds on higher dietary protein level is in agreement with the findings of Obioha *et al.*[7]. Accordingly, birds on higher protein diets at the time thay were been transferred

into battery cages in the layer, houses were. the biggest and had a significantly higher ($p<0.5$) body weight[4].

At the laying phase, the diets were the same and the treatment was based on thee differential dietary protein levels given them at the starter and grower stages. Accordingly, in an experiment conducted to test the effects of varying dietary protein on growing pullets, it was discovered that birds on 12% cp diets made their first lay much later than those on higher protein diets. This and the level of nutrient at the starter and grower phases[3]. The potential for laying is developed right from

Table 1: Effects of dietary protein levels on layers performance over 16 weeks from point of lay

	Dietary treatments			
Ingredients	20	18	16	14
Age at first lay (days)	152	152	156	165
Total feed intake (kg)	9.28^{a}	9.28^{a}	9.27^{a}	9.27^{a}
Total percentage hen day production	66.61^{a}	66.00^{a}	64.60^{ab}	61.72^{b}
Average egg weight (g)	64.24^{a}	63.4^{ab}	62.2^{a}	55.4^{b}
Efficiency of feed utilization	1.21^{a}	1.22^{a}	1.23^{ab}	1.26^{b}

Means bearing different superscripts are significantly ($p<0.05$) different from each other

Table 2: Effects of varying dietary protein levels at growers (7-20 WKS)

Parameters	20(%)	18(%)	16(%)	14(%)
Average total body weight gain (g)	996.08^{a}	968.08^{b}	961.20^{b}	941.20^{c}
Average total feed Intake (kg)	5.98^{a}	6.04^{b}	6.11^{c}	6.23^{d}
Average total feed gain ratio	6.01^{a}	6.24^{ab}	6.36^{bc}	6.61^{c}

Means bearing different superscripts are significantly different from each other

Table 3: Composition of starter (0-6wks) experimental diets

	Dietary treatment			
Ingredients	24	22	20	18
Maize	51.40	39.75	35.45	31.95
Palm kernel cake	15.05	15.00	15.00	15.00
Wheat offal		0.60	3.50	5.00
Cassava meal		10.00	15.00	20.00
Groundnut cake	21.00	26.60	25.00	24.00
Blood meal	88.55	4.00	2.00	0.00
Oyster shell	2.50	2.50	2.50	2.50
Bone meal	0.80	0.80	0.80	0.80
Vit-mineral mixture	0.30	0.30	0.30	0.30
Salt	0.30	0.30	0.30	0.30
Methione	0.15	0.15	0.15	0.15
Total	100.00	100.00	100.00	100.00
Calculated Cp (%)	24.00	22.00	20.00	18.00
Calculated Me Kcal/Kg	2800.00	2800.00	2800.00	2800.00

Table 4: Composition of growers experimental diet

	Dietary treatment			
Ingredients	18	16	14	12
Maize	35.45	31.95	29.45	26.5
Palm kernel cake	15.00	15.00	15.00	15.00
Wheat offal	3.50	5.00	7.50	10.00
Cassava meal	15.00	20.00	25.00	30.00
Groundnut cake	25.00	24.00	19.00	14.00
Blood meal	2.00	0.00	-	-
Oyster shell	2.50	2.50	2.50	2.50
Bone meal	0.80	0.80	0.80	0.80
Vit-mineral mixture	0.30	0.30	0.30	0.30
Salt	0.30	0.30	0.30	0.30
Methionine	0.15	0.15	0.15	0.15
Total	100.00	100.00	100.00	100.00
Calculated Cp (%)	20.00	18.00	16.00	14.00
Calculated Me Kcal/Kg	2800.00	2800.00	2800.00	2800.00

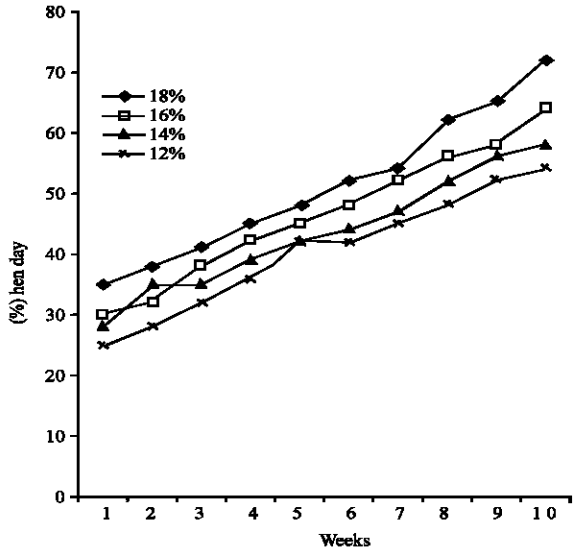

Fig.1: Percentage hen day production of guinea fowl fed varying dietary protein levels

the starter and grower phases and this is carried over to the laying period[8]. The higher egg weight produced by birds on the 20 and 18% cp diets is expected as egg weight has been reported to be a function of body size[3,4]implies that there is a direct relationship between maturity

Fig. 1 shows the graphical representation of percentage hen day production of the birds with varying protein levels .It shows that the values increased with age in all the treatments. The highest rise was recorded in birds on 18% Cp, while the least was in those on 12%Cp.

The feed cost analysis showed that the cheapest diet was the 12% cp, although this diet had the least efficiency as it was found to be the most profitable. It is most economical to produce a dozen eggs on the 16 % cp diet than those on the other diets when analysed from the grower stages to the layer stages. It is very clear from the results that dietary treatment at the growing period has a great influence on the productivity of the bird. It is hoped that this study will serve as a basis for further research into the nutrient requirement of the guinea fowl pullets in the tropics.

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REFERENCES

1. Balogun, O.O., A.A. Adeniyi, A. Bamigbose and S. Ibigbemi, 2001. Performance of layers fed graded levels of blood - Rumen mixture content. J. Agric. Res. Develop., 1: 7.
2. NRC, 2001. Nutrient Requirements of Dairy Cattle 7th Edn. Washinton D.C. National Academy Press.
3. Mahonachi, M. and N. Atti, 2005. Effects of protein supplement of poor hay fed D 'Man lamb on their growth, carcass quality and meat composition J. Anim. Vet. Adv., 4: 214-220
4. Iroyati, P.O., 2003. Nutrient requirements of growing rabbits in the tropics. Nut., 22: 4-6.
5. Ogbonna, J.U., F.I. Ogundola and 2001 Oredola. Effects of wet feed on cockrel chicken performance. Nig . J. Anim. Prod., 28: 45-51.
6. Ayannwale, R. and Gado, 2001. Effects of commercial diets on egg quality characteristics. J. Anim. prod., 28: 202-206.
7. Obioha, F.C., B.O. Asuquo and D. Igbo, 1982. Optimum protein and energy level for local and exotic egg type chickens Nig. J. Anim. Prod., pp: 35-43.
8. Carlson, C.W. and R.A. Nelson, 1981. Grower's diet and the effect upon. Subsequent performance of layers type of pullets. Poul. Sci., 60: 1272-1281.