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All editorial corespondence should be addressed to

Professor Anthony I. Ologhobo
Editor-in-Chief, TJAS.
Department of Animal Science
University of Ibadan, Ibadan, Nigeria.

Mallam Y.S Kudu

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THE RESPONSE OF WILD WEST AFRICAN GUINEA FOWL TO VARYING LEVELS OF DIETARY PROTEIN UNDER INTENSIVE MANAGEMENT

B.A. AYANWALE AND Y. S. KUDU,

Department of Animal Production, Federal University of Technology, Minna, P. M. B. 65, Minna, Niger State, Nigeria.
E-mail: drreju @ Skannet. Com. Tel: 066/222397 Ex-1152.

Target Audience: Poultry producers, nutritionists, feedmillers.

ABSTRACT

A total of 186 eggs from Wild West African Guinea fowl were collected from the bush at the on set of raining season. The eggs were incubated at 36-370C to get the Guinea fowl keets used for this work. The hatchability of the eggs was 86% and the eggs hatched on the 27th day of incubation. The keets were fed on 24% protein diet for 8 weeks. At the end of the 8th week the keets were divided into 4 experimental groups in two replicates. Groups 1,2,3 and 4 birds were fed on diets containing 18, 22 and 26% levels respectively up to 20th week of age. The results showed that the average body weight of the Guinea fowls increased with the increasing dietary protein level. The 26% dietary protein level promoted the heaviest Guinea fowls and the least was found in 18% protein fed Guinea fowls. This pattern was observed in weight gains. Feed consumption and dry matter digestibility were highest in 26% dietary protein fed Guinea fowls.

Protein was better utilized for growth by Guinea fowls fed 26% protein than any other group resulting in the higher nitrogen retention for this group. It was concluded that for intensive management of the wild indigenous West African Guinea fowls the keets could be fed on 26% dietary protein level up to the end of the growing stage.

Key words: Guinea fowl, Wild, Protein and Intensive Management.

DESCRIPTION OF PROBLEM

The research on the nutrient requirement of the indigenous Wild West African Guinea fowl is still very much in its infancy when compared to the domestic chicken. There has been an increased need for the raising of indigenous Guinea fowl in large quantities to supplement other sources of animal protein in developing countries (1,2). Several years of extensive and semi intensive management have not improved this condition. So also many years of adoption of the modern sophisticated means of production has had little or no impact on the raising of the wild indigenous Guinea fowl. The reported protein requirement for Guinea fowls varies widely (3,4,5,6,7,8,9,10,11,12). It is only (13) that reported work on the wild (Numida meleagris galeata). Other authors either work on the domesticated

or semi domesticated Guinea fowl. (14) reported that the population of Guinea fowls in the lands to be 44 millions, much more than the number under captivity in Nigeria. The obvious conclusion from all these is that there is a dearth of information on the nutrient needs of the wild West African indigenous Guinea fowl under intensive management. This work was subsequently designed to investigate the performance of the wild Guinea fowls fed varying protein levels under intensive management system.

MATERIALS AND METHODS

Eggs of the wild Guinea fowl used for this work were collected at the onset of rainfall in the Guinea Savanna land, after Tundun Fulani, Taka Lafia and Rugan Fulani villages around Minna, Niger State, Nigeria. Minna is situated in 90 400N latitude, 60 30E L at 300m elevation. Minna lies in the southern Guinea Savanna zone of Nigeria and has a sub humid semi arid tropical climate with a mean annual precipitation of 1200mm (90% of total rainfall occurs between the months of June and August). Temperature rarely falls below 22°C Wet season temperature average about 29°C. The peaks are 400c (February March) and 36°C (November December).

The eggs from the wild Guinea fowl hens were incubated at the temperature 35-37°C as recommended by (15). Hatchability of the eggs was 86%. The eggs started hatching on the 27th day of incubation. Keet brooding started immediately after hatching. Brooding was done on deep litter. Feed and water were given *ad libitum*The starter diet contains 24% crude protein and was fed for 8 weeks. At the end of the 8th week the keets were divided into 4 treatment groups. Each treatment was in two replicates. Source of heat was 60-watt electric bulb each suspended by electric cable from the ceiling to almost touch the ground. Chick feeders and drinkers were used. Routine Vaccination and medication usually applied on domestic fowls were applied on the keets. Piperazine worm expeller was found to be very effective as dewormer. Albendezole worm expeller was used. The keets were first weighted at day old and subsequent weightings were carried out weekly.

The partitioning of each rearing pen was raised to the roof using perforated sacks because of the flighty nature of the guinea fowls. Digestibility of the experimental diets was measured at 18 weeks of age. Total collection method (16) was used. The faecal samples were dried at 65°C until constant weights were obtained.

Records of weekly feed intake and body weights were kept from which weight gain, feed/gain ratio and protein efficiency ratios (PER) were calculated. Chemical analysis was by A.O.A.C. (17). Statistical analysis was

done as reported (18) and mean separation done using Duncan (19).

RESULTS

The average body weight of the wild Guinea fowl keets at day old ranges between 32.8 32.84g (Table 2.). At the beginning of the growing phase (9 weeks) the body weight had increased to between 241.50-247.0 ± 14.29g. At 20 weeks of age the average body weight was between 543.50-813 ± 112.0. The results indicate that 26%CP significantly ($p < 0.05$) promoted the greatest body weight, followed by 24% and the least was in Guinea fowls fed 18%CP. This same trend was observed in body weight gain, feed consumption, dry matter digestibility, nitrogen retention and PER. Feed/gain ratio showed no significant ($p > 0.05$) differences after 20 weeks of rearing.

Results shown in Table 3 indicate no significant differences in the proportion of lungs and liver and spleen but high protein level significantly ($p < 0.05$) increased the heart proportion of guineafowl.

DISCUSSION

Table 1 shows the composition of the experimental diets. No additional protein was provided by insects. (14) had recommended that the protein could be reduced to 16% with insect supplement and (11) recommended 18%CP for Guinea fowl raised intensively. Rearing Guinea fowl under intensive system, in commercial quantity, exposes the keets to a lot of hazards making the method unsuitable. Catching insects in enough quantities for commercial Guinea fowl production is quite laborious, if not impossible with the present known techniques. For these reasons the diets in Table 1 are without insect supplements. The body weight increased with age.

The distribution of the guineafowl keets into the 4 groups was done at 8 weeks of age. No significant differences ($p > 0.05$) were observed in the average body weights of the birds at 9 weeks. At 20 weeks of age significant differences ($p < 0.05$) were observed in the body weight of the guineafowls. The body weight and weight gain of the guinea fowls increased with increase in the protein levels and 26%CP level promoted the greatest body weight gain (Table 2). The average body weights of the guineafowls were slightly lower than the values reported by (20). He did not state the strain and the system of the Guinea fowl management making comparison difficult. However, the body weight and the gains compare well with the values reported by (13).

The highest feed intake was observed in guinea fowls fed 22% and 24%CP and the least feed intake was found in 18%CP fed Guinea fowls which are lowered than the values of (14). The high feed intake of 26%CP fed birds also resulted into high faecal output compared to Guinea fowl on 18%Cp.

Table 1. Composition of the wild Guinea fowl diets managed under intensive system. (g kg-1)

	Starter diet	Finisher diets			
	Protein level(%)	Protein levels(%)			
Ingredients	24	18	22	24	26
Maize	477.10	639.30	531.10	477.10	423.30
Groundnut	345.40	183.20	291.40	345.40	399.20
Rice bran	50.00	50.00	50.00	50.00	50.00
Fish meal	10.00	10.00	10.00	10.00	10.00
Blood meal	50.00	50.00	50.00	50.00	50.00
Oyster shell	25.00	25.00	25.00	25.00	25.00
Bone meal	35.00	35.00	35.00	35.00	35.00
Salt	5.00	5.00	5.00	5.00	5.00
Premix	2.50	2.50	2.50	2.50	2.50
Analysis results(%)					
Crude protein	24.61	18.93	22.67	24.60	26.49
Ether extract	9.98	9.80	9.70	9.93	9.94
Crude fibre	1.31	1.47	1.45	1.38	1.48

To provide the following per 100kg of the diet: 44omg, riboflavin; 720mg calcium pantothenate; 2g, niacin; 2.2g choline chloride; 15mg folic acid; 1mg vitamin B12; 15mg retinol; 165g vitamin D2; 1000mg DL - tocopherol acetate; 1700mg copper; 200mg iodine; 3000mg manganese; 5000mg zinc; 10, 000mg iron.

The observed difference between the present work and (14) might be due to the differences in the feeding materials. (13) fed the guineafowls on insects, grass and leafy vegetable matters. Dietary protein was more efficiently utilized by guinea fowls fed 26%CP. This perhaps, accounts for the higher body weight and gains of the birds in this group. The increased in heart proportion shown in Table 3 could be attributed to the tendency of the internal organs to grow in proportion to their body weights. As the protein levels in the diets increased birds showed increased tendency to retain more (Table 4). This explain why guineafowls fed on 26%Cp had better weight than guineafowls in any other group.

990 - 10
7.07 - 7.49 ± 36

Table 2: Performance of Wild West Africa indigenous guineafowl raised under intensive management

Parameters	Dietary Protein Levels(%) 18	22	24	26	STD
Initial body weight(g)	32.84	32.81	32.83	32.80	+0.03
Average weight(g) at 9 weeks	247.0	241.50	242.50	245.50	+14.29
Average weight(g) at 20 weeks.	543.50d	647.00c	700.50b	813.50a	+112.00
Weight gain(g)	510.66d	614.19c	667.67b	780.70a	+10.65
Feed intake(g)	990.24c	1045.54a	1033.60b	1048.87a	+25.37
Dry matter digestibility(%)	54..33c	59. 24bc	63.68b	71.25a	+6.76
Protein efficiency ratio	0.54b	0.47b	0.48b	0.58a .	+0.16
Feed/gain ratio	1.94	1.78	1.55	1.34	+1.56

Values in each row without a common superscript are significantly different from each other at $p < 0.05$.

Table 3: Effect of different protein levels on the internal organs of the Wild West African indigenous guineafowl.

Internal organs(%)	Different Protein Levels (%) 18	22	24	26	STD
Lungs	0.75	0.76	0.75	0.76	+0.15
Liver	1.64	1.66	1.61	1.65	+0.22
Heart	0.47c	0.54b	0.59b	0.62a	+0.07
Spleen	0.05	0.05	0.06	0.06	+0.13

Values in each row without a common superscript are significantly different from each other at ($p < 0.01$).

Table 4: Nitrogen utilization by the Wild West African indigenous guineafowl fed different protein levels under intensive management system.

Growing phase(56 140 days)	Different Protein Levels(%) 18	22	24	26	STD
Nitrogen intake(g/day)	1.4	1.81	2.01	2.33	+0.28
Nitrogen output(g/day)	0.43	0.45	0.45	0.48	+0.21
Nitrogen retained(g/day)	0.97	1.37	1.56	1.85	+0.48
Nitrogen retention(%)	69.29b	75.69ab	77.61ab	79.40a	+1.17

Values in each row without a common superscript are significantly different from each other ($p < 0.05$).

CONCLUSION

Wild West African indigenous Guinea fowls performed better on 26%CP when managed under intensive system than those fed on 18%, 22%, and 24%CP. It could be concluded from this that the eggs of the wild Guinea fowls usually available in the Guinea Savanna of West African countries, from the onset of rainfall, are fertile, could be incubated directly on collection, be hatched, and grow if fed 26%CP under intensive system of management.

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