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PERFORMANCE OF GROWING TURKEYS FED DIETS CONTAINING VARYING LEVELS OF HONEY

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ABSTRACT

A fifteen weeks feeding trial was conducted to determine the performance of growing turkey fed diets containing varying levels of honey. Forty five fifteen weeks old growing turkey were randomly allotted to three treatments and three replicates, each having five birds arranged in a completely randomized design (CRD) experiment. Three diets were formulated such that diet 1 contained no honey (0 %) and served as the control, while diet 2 and 3 contained 2 % and 4 % level of honey respectively. The birds were fed the experimental diets for 15 weeks during which time data were collected on feed intake and weight gain. At the 6th week of the experiment, a digestibility trial was carried out using specially-designed metabolic cages. The results obtained shows that birds fed diet containing 4 % honey inclusion performed better in terms of final body weight (3218.33g), daily body weight gain (28.39g) and feed conversion ratio (6.39) than those fed other diets though the values were not significantly ($p > 0.05$) different. There were no significant ($p > 0.05$) differences in the digestibility of dry matter, crude protein, crude fibre and ash; but the digestibility of nitrogen free extract was significantly ($p < 0.05$) higher (97.76 %) among birds fed diet 3 than other groups. Therefore, it can be concluded that honey can be included up to 4 % in the diets of growing turkey with optimum performance.

Key words: Performance, honey, growing turkey nutrient digestibility

INTRODUCTION

Poultry production is an age - long occupation. It has been one of the most popular enterprises adopted by small, medium and large scale farmers in both rural and urban areas and has developed into a commercial enterprise (Idowu *et al.*, 2005). The problem of low protein intake among Nigerians can be solved by increasing the production of meat and eggs, using poultry species that have fast growth rate, large size and excellent meat quality. Emphasis in the past has been on the use of broilers and laying chickens but this has proved inadequate (Ugwuena and Onwudike, 2010). Turkey seem to be more efficient than broiler chicken in converting dietary protein into edible carcass protein and with a high value attributed to its breast meat (Case *et al.*, 2010). Increased turkey production in Nigeria should therefore be encouraged taking advantage of the bird's large size, fast growth rate, high fecundity and excellent meat quality. The nutrition of an animal is of great importance if this is to be achieved in practice. Much of the nutritional content of farm animal is derived from the major feed ingredients such as maize, wheat and soybean meal. In modern day farming, the nutritional requirements of farm animals are well understood and all requirements can be met through direct dietary supplementation of the limiting nutrients in concentrated form. The benefits of additives is not only nutritional thus affecting the growth rate of the animal concerned, but also has health and welfare implication (Kizilaslan and Kizilaslan, 2007). The introduction of feed additives to livestock feed has led to

several researches by different authors (Iyayi and Bashar, 1998; Abubakar *et al.*, 2004) using different types of feed additives for improving the performance of poultry birds. To avoid the risks in the use of antibiotics as growth promoters, the discovery and use of prebiotics and probiotics (having no withdrawal time and no residual effect) have become necessary. One of such prebiotics additive is honey. Honey is one of the products obtained from bee keeping and is relatively the sweetest natural product that is widely available in different parts of the world (Terrab *et al.*, 2003; Malacalza *et al.*, 2005). It is readily obtained from natural or cultured bee colonies. Honey improves palatability of feed, serves as feed binder, improves the nutritive value, growth rate, digestibility and feed efficiency of livestock feeds (Busserolles *et al.*, 2002). Therefore, the aim of this study was to evaluate the performance and nutrient digestibility of growing turkeys fed diets containing varying levels of honey.

MATERIALS AND METHODS

Growth and Digestibility Trial

Forty five (45) fifteen weeks old grower turkeys were used for this experiment. The birds were randomly allotted into three treatment groups of 15 birds and each group assigned to one of the dietary treatment of T₁, T₂ and T₃ (containing 0, 2 and 4 % honey, respectively) in a completely randomized design experiment. Each treatment group was further subdivided into three replicates of five birds each. Feed and water were provided *ad libitum*; uniform light were provided 24 hours and proper vaccinations and medications were given. Records of feed intake were taken daily, while that of body weights were

taken weekly. Digestibility study was carried out at the 6th week of the growing phase of the experiment. Four (4) birds in each of the treatment were weighed, isolated and placed in special metabolic cages for three days adjustment period and data collection lasted for four days. The total droppings were collected, oven dried, weighed and put together for proximate analysis using the procedures of AOAC (1990). The birds were managed purely on concrete floor with wood shavings on it, demarcated with wire mesh.

Statistical Analysis

All data collected were subjected to analysis of variance (ANOVA) at 5 % probability level using the statistical package for social scientists (SPSS, 2007). Where means were significant, they were separated using the Duncan Multiple Range Test using the procedures of Steel and Torrie (1980).

RESULTS AND DISCUSSION

The performance of growing turkeys fed diets containing varying levels of honey (Table 2) revealed no significant ($p > 0.05$) differences in final body weight, daily feed intake, daily body weight gain and feed conversion ratio among the treatment groups. The result is in line with the findings of Obun *et al.* (2008), Nweze and Ekwe (2008) and Obun *et al.*, (2010). The apparent nutrient digestibility of growing birds fed diets containing varying levels of honey

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shown in Table 3 revealed that there were no significant ($p > 0.05$) differences in all the parameters measured except nitrogen free extract (NFE). The apparent digestibility of NFE was significantly ($p < 0.05$) different among all the groups with T₁ (92.25 %) having the highest value compared to the control T₁ (97.25 %) which has the lowest value. Generally, all the treatment had digestibility value over 50 % which means that they all had high digestibility. The results obtained for dry matter, crude protein and crude fibre were higher than those obtained by Obun *et al.* (2010). In their studies, the enhanced nutrient retention in the honey diets could be attributed to the presence of enzymes and several vitamins which accounted for the high digestibility. This finding is in agreement with Nassir *et al.* (2009) who reported that there were variable quantity of vitamins such as ascorbic acid, thiamine, riboflavin, pyridoxine, nicotin and panthotenic acid which could contribute in enhancing the efficiency of feed digestibility.

CONCLUSION

It is therefore concluded that honey can be included in the diets of growing turkeys up to 4 % without any deleterious effects on their performance and nutrient digestibility.

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Table 1 Composition of the experimental diet fed to the grower turkeys (%)

Ingredients	Inclusion level of honey (%)		
	T1 (0.00)	T2 (2.00)	T3 (4.00)
Maize	58.00	56.00	54.00
GNC	29.00	29.00	29.00
Honey	0.00	2.00	4.00
Palm oil	2.00	2.00	2.00
Wheat offal	4.90	4.90	4.90
Fish Meal	2.00	2.00	2.00
Lysine	0.30	0.30	0.30
Methionine	0.30	0.30	0.30
Bone meal	3.00	3.00	3.00
*Premix	0.25	0.25	0.25
Salt	0.25	0.25	0.25
Calculated Composition:			
ME (kcal/kg)	3059	3067	3075
Crude protein (%)	20.23	20.23	20.23
Crude fibre (%)	3.19	3.13	3.08
Lysine (%)	1.08	1.08	1.07
Methionine (%)	0.5	0.56	0.55
Calcium (%)	1.34	1.34	1.34
Phosphorus (%)	0.94	0.93	0.93

*Each 2.5kg contained: Vit. A (7,500IU), Vit. E (1,000IU), Vit. B₁ (375mg), Vit. B₂(125mg), Vit. B₃ (500mg), Vit. B₆ (150mg), Vit. B₁₂ (2.5mg), Vit. K (15mg), Vit. C (10mg), folic acid (150mg), panthotenic acid (14.4mg), Ca (12.5mg), Cu (8.0mg), Fe (32mg), I (0.8mg), Se (100mg), Mg (0.25mg) and Cl (250mg).
 T1= Diet 1 containing 0 % honey inclusion (control diet), T2= Diet 2 containing 2 % honey inclusion
 T3= Diet 3 containing 4 % honey inclusion

Table 2: Performance of growing turkey fed diets containing varying levels of honey.

Parameters	T1	T2	T3	SEM	LS
Initial bodyweight(g)	171.44	1768.56	1799.44	6081	NS
Final body weight(g)	2926.1	3055.56	3218.33	1.62	NS
Daily feed intake(g)	151.31	150.85	152.90	5.27	NS
Body weight gain (g)	25.07	25.82	28.39	1.57	NS
Feed conversion ratio	6.68	6.69	6.39	0.43	NS

NS = No significant difference (P>0.05), SEM = Standard error of means, LS = Level of significance

Table 3: Apparent nutrient digestibility of growing turkey fed diets containing varying levels of honey

Parameter	T1	T2	T3	SEM	LS
Dry matter	92.40	91.15	92.43	0.58	NS
Crude protein	91.62	90.25	92.19	0.66	NS
Crude Fibre	84.39	77.46	84.79	1.77	NS
Ether extract	91.25	90.96	92.38	0.61	NS
Ash	76.32	64.91	69.42	2.63	NS
Nitrogen Free Extract	92.25 ^{ab}	95.75 ^b	97.76 ^a	0.38	*

Means of the same row with different superscripts were significantly (P<0.05) different.

NS = No significant difference (P>0.05); SEM = Standard error of means

LS = Level of significance