

PERFORMANCE CHARACTERISTICS AND HAEMATOLOGICAL INDICES OF BROILER FINISHER BIRDS FED DIFFERENT INFUSION LEVELS OF NEEM LEAF EXTRACT.

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ABSTRACT

A research study was carried out in a 21 days experiment to determine the performance characteristics and haematological indices of broiler birds fed different infusion levels of neem leaf extract. The diets contain equal composition of feed ingredients at finisher phase for all treatment. Eighty "fidan" breed of unsexed day old chicks were randomly distributed into five treatment group of sixteen birds each into which neem leaf extract was incorporated at levels of 0, 25, 35, 45 and 55ml/litre of drinking water representing T1, T2, T3, T4 and T5 respectively. Birds on the 55ml/litre of neem leaf infusion had significantly ($p < 0.05$) superior values in terms of average final body weight, average daily weight gain, average daily feed intake and feed conversion ratio. The haematological indices studied showed that treatment effect was significantly ($p < 0.05$) different among dietary groups, with treatment 5 having the highest value of white blood cell (WBC) and hemoglobin. While values for packed cell volume (PCV) and red blood cell (RBC) showed no significant ($p > 0.05$) difference among treatments.

Keywords: Performance, haematology, neem leaf infusion, broiler birds.

INTRODUCTION

Over the years, the poultry industry has made enormous progress in boosting animal protein in Nigeria and around the world. It is one of the most efficient and rapid converter of vegetable food into animal proteins and also provides a quick outcome as compared to production of protein from other animal sources (Oluyemi and Robert, 2000). Decreased weight gain, management problems and diseases are the major constraint in the poultry sector. Several antibiotics have been used in the livestock industry as growth promoters and to reduce the incidence of infectious diseases. Through the use of antibiotics in livestock industry, the average growth improvement has been estimated to be between 4 and 5% and feed utilization improved by 2 to 5% (Mohan *et al.*, 2003). But over the years concern have been raised over the use of antibiotics in animal production especially as therapeutics and growth promotant, due to the problem of increasing resistance in bacteria of human and animal origin, incidence of mutation and the issue of residue effect of the antibiotics in animals and hence the humans which

automatically are the main consumers. Consequently several alternatives have been investigated to reduce or replace antibiotics in livestock production. Thus, researchers have identified several beneficial chemical compounds in medicinal plants which can play important role in improving production and immune system of birds against different disease and could possibly be used as natural growth promotant to replace the synthetic types and other feed additives.

Neem (*Azadirachta indica*) has attracted a lot of international attention in recent years owing to its wide range of medicinal properties. Neem also known as the sacred gift of nature is a native plant of South Eastern Asia and distributed in India and other neighbouring countries (Olabode, 2008) and is known for its incredible therapeutic and ethnomedicinal values for human (Dhama *et al.*, 2013).

MATERIALS AND METHODS

The research work was conducted at the poultry unit of the Animal production department, Federal college of Agriculture, Ishiagu, Ebonyi

state. Eighty, 5 weeks old broiler birds of “fidan” breed were randomly allocated to five treatments of sixteen birds per treatment, which was further replicated twice with eight birds per replicate. The diets contain equal composition of feed ingredient at the finisher phase. The levels of neem leaf infusion for treatments T2, T3, T4 and T5 is 25, 35, 45 and 55ml/litre in the drinking water. T1 served as the control with 0ml/litre of neem leaf infusion.

At the end of the 9th week, blood samples were collected from two birds per treatment for the determination of the hematological parameters. The collection was done in the morning to avoid excessive bleeding and severe stress. The blood was collected into bottles containing dispotassium salt of ethylene diamine tetra-acetic (EDTA-K2+) which served as anticoagulant. All data collected were subjected to analysis of variance (ANOVA) using the completely randomize design (CRD) (Steel and Torrie, 1990). Means were separated using the new Duncan’s multiple range test (Obi, 2002).

RESULTS AND DISCUSSION

Results showing the performance characteristics of the birds are shown in table 2. Average daily feed intake was significantly ($p < 0.05$) higher for birds in treatment 5 (122.1g) than the other four treatment groups. This could be as a result of the high level of quecetin which is reported to have antibacterial and antifungal properties (Elangovan *et al.*, 2000), which is one of the major active ingredients in the neem leaf extract. This active component of the neem leaf extract was able to create a harmonious gut environment suitable for the release and assimilation of digestive nutrients necessary to enhance growth. Significant ($p < 0.05$) difference was noticed among the birds in term of daily weight gain. Birds in treatment 5 (57.44g) had a superior value, which was significantly ($p < 0.05$) higher than for birds in other treatments. This was in line with the findings of Chakaravarty and Prasad (1991) who also reported higher weight gain when broilers were infused with neem leaf extract. No definite trend was observed in the feed conversion ratio; however treatment 5 with value of 2.13 was the best, while treatment T3 had the least value of 2.64. This showed that treatment effect had minimal influence on the metabolization of nutrient.

The result obtained for haematological indices showed that haemoglobin values was highest in treatment 5 (11.50 s/dl), while T2 had a least value of 9.10 s/dl. This was in line with the findings of Esonu *et al.* (2006) who observed significant increase in haemoglobin level when neem leaves were administered to a laying hen. While blood cell count was highest in T5 with value of 8.75, which was significantly ($p < 0.05$) higher than for birds on the other treatments. This was also in agreement with the work of Esonu *et al.*, (2006) who observed significant increase in white blood cell while feeding layers; but in contrast with the findings of Gautam *et al.* (2004) who noticed no significant ($p > 0.05$) effect on lymphocyte and white blood cell count when *Ania somnifera* was offered to layers. The result obtained for red blood cell and packed cell volume did not differ significantly ($p > 0.05$) among treatment groups and were within the standard haematological range value as given by Mitruka and Rawsly (1977).

CONCLUSION

From the present study it can be concluded that neem leaf infusion can be tolerated by broiler birds up to 55ml of fresh drinking water and can thus be effectively used as potential natural growth promoter and as an immune stimulant contributing to better body weight, lower mortality and higher antibody titer (as seen in the high level of WBC).

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Table 1. Percentage composition of experimental diet

Feed ingredients	Quantity
Maize	54.50
Wheat offal	7
Soybean meal	3
Groundnut cake	20.80
Fish meal	1.50
Palm kernel cake	8
Limestone	1.50
Bone meal	2.50
Methionine	0.35
Lysine	0.15
Mineral/vitamin premix	0.35
Salt	0.25
Mycofix	0.05
Total	100
Calculated values;	
Crude protein (%)	19.61
Energy (Kcal/kg)	2870

Table 2. Performance characteristics of broiler finisher birds given different infusion levels of neem leaf infusion.

Parameters	Treatments					SEM
	T1	T2	T3	T4	T5	
Initial body wt (g/b)	895	900	898	895	895	-
Final body wt (g/b)	2362.50 ^a	2133.34 ^c	2083.34 ^d	2268.75 ^b	2375.00 ^a	52.33
Average daily feed intake (g/b)	119.52 ^c	120.15 ^b	120.05 ^b	119.76 ^c	122.11 ^a	3.57
Average daily weight gain (g/b)	55.73 ^b	46.23 ^c	45.49 ^{cd}	55.68 ^b	57.44 ^a	5.85
Water intake (m/l)	4566.09 ^a	4234.80 ^b	3998.25 ^c	4062.99 ^{bc}	3460.01 ^d	186.55
Feed conversion ratio	2.14 ^b	2.60 ^a	2.64 ^a	2.15 ^b	2.13 ^b	0.11

Table 3. Haematological indices values for broiler birds given different infusion levels of neem leaf infusion.

Parameters	Treatments					SEM
	T1	T2	T3	T4	T5	
Packed cell volume (%)	26.15 ^a	25.50 ^b	25.90 ^b	26.01 ^a	26.10 ^a	1.13
Haemoglobin (s/dl)	9.10 ^b	8.45 ^c	8.60 ^c	9.50 ^b	11.50 ^a	0.32
Red blood count (x10 ¹² /c)	4.55 ^a	4.14 ^{ab}	4.57 ^a	4.33 ^a	4.50 ^a	0.09
White blood count (x10 ⁹ /c)	7.90 ^b	7.90 ^b	8.40 ^a	8.65 ^a	7.75 ^a	0.13