

PERFORMANCE AND HAEMATOLOGICAL INDICES OF FINISHER BROILERS FED SUNDRIED YAM PEEL MEAL DIETS

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ABSTRACT

A 4- week study was conducted using 160 unsexed Anak broilers to determine the effect of yam peels meal (SYPM) as partial replacement for maize on the performance and haematological indices of finishing broilers. The broilers were divided into four (4) groups and fed diets containing 0, 10, 20% and 30% yam peel meal. Each group was replicated four times with 10 birds per replicate in a completely randomized Design (CRD). Feed and water were provided ad libitum for the period. Results showed that significant ($p > 0.05$) difference did not exist among the treatment with respect to body weight gain, feed intake and feed conversion ratio. No mortality was recorded over the period of the trial. The experimental diets did not have significant ($p > 0.05$) effect on haematological indices such as Red blood cell (RBC), packed cell volume (PCV), haemoglobin (Hb), mean corpuscular Concentration (MCHC), white blood cell (WBC). The results of this study revealed that 30% sundried yam peel meal can replace maize in diet of finishing broilers with better performance.

Keywords: Broiler, Sundried Yam Peel Meals and performance.

INTRODUCTION

The production of sufficient animal protein has become a serious challenge to the livestock industry. Research has shown that at present approximately two-third of the world population subsists on poorly balanced diet that retards normal growth. The main deficiency in their diets has been shown to be animal protein.

In Nigeria, there is decrease in animal protein intake. Nigerians consume about 29% Of the recommended amount of 35g per head per day (FAO, 2000). Thus, there is need to increase animal productivity by making animal protein source available and affordable to the Nigerian populace. Tewe (1987) had earlier suggested that the best logical solution to our national meat is to increase poultry production.

One of the factors militating against rapid expansion of intensive poultry production in Nigeria is shortage and high cost of feeds and feed stuff (Omeje et al, 1979, Iyayi et al 2004). Cereal grains form the bulk of commercial poultry feeds. Bello (1988) has it that maize has the highest inclusion rate of 400-500kg/mt as compared to other cereal grains. But the demand for maize has always exceeded its supply due to its consumption by both human and animal. In view of this, there is need for poultry farmers to search for alternative energy source that is cheaper and readily available non- conventional feedstuff or agro-by products for partial replacement of the conventional ones. Large number of agro-by products feedstuff with enormous potentials exists in Nigeria (Ologhobo, 1992). One of such by- products is yam peel. Yam peels are basic wastes not consumed by humans, they are abundant and can be

sourced at no cost. Based on these, the present study was designed to determine the performance and haematological parameters of finishing broiler fed yam meal peel.

MATERIALS AND METHODS

Experimental Site

The experiment was carried out at the poultry and research unit of the Department of Animal Science, Akwa Ibom State University, Obio Akpa campus. Obio Akpa is located between latitudes $5^{\circ}17'N$ and $5^{\circ}27'N$ and between longitudes $7^{\circ}27'E$ and $7^{\circ}58'E$ with an annual rainfall ranging from 3500mm – 5000mm and average monthly temperature of $25^{\circ}C$, and relative humidity between 60-90%. (Wikipedia, 2016).

Source of Yam Peels And Processing Methods

Yam peels were collected fresh from kitchens; yam barn, and partial spoilage yam from barns. The peels were sundried for 4-7 days, thereafter run through a hammer mill with 2mm sieve to homogenize it and produced yam peel meal (YPM)

Proximate Composition

Yam peel meal moisture content was determined by following the method of Rajaran and Janardhanan (1990). Nitrogen content was determined according to the Kjeldahl method (Hunphries 1956) and the percentage of crude protein was calculated using the factor 6.25. The crude lipid contents, shide fibre and ash were determined in accordance with the standard Methods of the AOAC (1990). Carbohydrate was obtained by difference. The energy value of the meal was estimated in kilojoules (KJ) according to Siddhuraja et al (1996) by multiplying the percentage of crude protein, crude fat and carbohydrates by the factors 16.7, 37.7 and 16.7 respectively.

Experimental Diet

Four (4) experimental broiler finisher diets were formulated such that diet 1 (control) contained yellow maize as source of energy and no yam peels. Diet 2, 3 and 4 contain yam peel meal at 10; 20 and 30% levels respectively, partially replacing maize in the diet. Other ingredients were added such that the diet met the nutrients requirements for finisher broilers (Table 1)

Table 1: ingredients and Nutrient Composition of the Experimental Broiler Diets

Ingredients	Diets			
	1(0%)	2(10%) SYPM	3(20%)SYPM	4(30%)SYPM
Yellow maize	60.00	50.00	40.00	30.00
Yam peels	0.00	10.00	20.00	30.00
Soya beanmeal	20.00	20.00	20.00	20.00
Fish meal	5.00	5.00	5.00	5.00
Wheat offal	10.00	10.00	10.00	10.00
Bone meal	4.00	4.00	4.00	4.00
Tm/vit premix	0.25	0.25	0.25	0.25
Common salt	0.25	0.25	0.25	0.25
L-lysine	0.25	0.25	0.25	0.25
L-methionine	0.25	0.25	0.25	0.25
Total	100	100	100	100

Calculated Chemical Composition (% DM)

Crude protein	19.28	19.26	19.23	19.01
Ether extract	4.00	3.71	3.43	3.15
Crude fibre	3.09	3.76	4.44	5.12
Ash	3.47	4.32	5.16	6.01
Nitrogen free extract	70.16	68.95	67.74	66.71
ME (mcal/kg)	2.81	2.50	2.13	1.78
Total	74.8	66.8	58.8	50.8

To provide the following per kg of feed; vitamin A, 10,000iu; vitamin D3 2000iu; vitamin E, 12mg; vitamin K, 2mg; vitamin B1, 15mg; vitamin B6, 1.5mg; vitamin B12, 12mg; Niacin, 15kg; pantothenic acid, 5mg; folic acid, 5mg; biotin, 2mg; choline chloride, 100mg; manganese, 75mg; zinc, 5mg; iron, 2mg; copper, 5mg; iodine, 10mg; selenium, 2.0mg; cobalt, 5mg; Antioxidant, 125mg.

Experimental Bird/Design

One hundred and sixty (160) day old Anak Strain of broiler chickens of mixed sexes were used for the experiment. The birds were obtained from a local hatchery and raised in brooder on yam peel meal free commercial starter diet. At 35- day of age, the chickens were divided into four (4) groups of 40 birds and each group was randomly assigned to one of the four (4) experimental diet using completely randomized design. Each group was further replicated four (4) times. The birds were reared in a deep litter pen measuring 2m x 2m. Feed and water were provided ad libitum. The birds were weighed at the beginning of the experiment and weekly thereafter. Feed intake, calculated feed conversion ratio and mortality were recorded over the period.

Blood Collection and Analysis

At 4 weeks of the feeding trial, 2 birds were randomly selected from each replicate and bled by puncture of the wing vein with sterile needles. Blood samples collected were separately presented in labeled sterilized bottles containing ethylene Diamine Tetra. Acetic acid (EDTA) for analysis of haematological parameters such as Red blood cell (RBC), packed cell volume (PCV), haemoglobin (Hb), mean corpuscular Concentration (MCHC), white blood cell (WBC), lymphocytes and neutrophils were determined by routine methods as previously described by (Campbell, 1988)

Data Analysis

Data generated were subjected to analysis of variance (ANOVA) and statistical significance were observed, the means were compared using Duncans New Multiple Range Test as outlined by Obi (1990).

Results and Discussions

The proximate composition of yam peel meal used in this study is shown in Table 2, the results indicated that it contained 9.87 CP, 6.01 CF, 1.34 EE, 4.81 Ash and 77.97 % NFE. This reveals that yam peels are sources of carbohydrate rather than crude protein. The results were similar to S.O Akinmutumi et al., (2008). The result showed that there were no significant ($p > 0.05$) differences in the feed intake, daily weight gain and feed conversion ratio among the different dietary treatments.

Table 2: Proximate Composition of Yam Peels

Nutrients	Yam Peel
Dry Matter (DM)	89.74
Crude Protein (CP)	9.87
Crude Fibre (CF)	6.01
Ether Extract	1.34
Ash	4.81
Nitrogen Free Extract	77.97

The performance of finishing broiler fed yam peel meal is presented in table 3. The growth and feed efficiency of birds fed yam peel meal compared favourably with that of the control. The values for body weight gain of birds fed 10, 20 and 30% SYPM were numerically higher than the value for the control group. Also 20% SYPM group had the best feed conversion ratio. No mortality was recorded in this experiment.

Haematological Indices of finisher broiler fed Yam Peel meal is shown in Table 4. The results indicate that haematological values such as RBC, PVC and Hb were not significantly ($p > 0.05$) affected by the treatment but increased slightly with increasing dietary inclusion of yam peel meal. The MCHC values of birds fed control diet. The leucocytes components (WBC, lymphocytes and neutrophil) did not differ significantly ($p > 0.05$) between diet groups. Jean, 1993 reported that bacterial and viral illness affect the number of white corpuscles and the ratio between the different types of white corpuscles and the percentages of the various types in healthy animals vary little but are greatly modified in sick animals. The results of the present study clearly indicate that the birds were not at stress and had no bacteria or viral illness hence the non-significant ($p > 0.05$) leucocytes values observed among the treatment.

The non-significant ($p > 0.05$) values for RBC, PVC and Hb indicated that treatment diet did not contain anti-nutritional substances. Leville and Sauberlich (1961) observed that haematological parameters has positive or negative correlation with nutritional quality of the diet and performance of the birds. The values for all the haematological parameters in this study fall within normal range for poultry (Mitruka and Rawnsley, 1997).

CONCLUSION

The results of this study suggest that sundried yam peel meal (SYPM) can be used as a replacement for maize in the diet of finishing broilers up to 30% inclusion without any deleterious effect on the growth performance and haematological indices of the birds.

Table 3: Performance of finisher broiler fed Sundried Yam Peel meal

Performance parameter			Diet 1 (0%)	Diet 2 (10% YPM)	Diet 3 (20% YPM)	Diet 4 (30% YPM)	SEM
Average	Initial	body	1110.10	1112.0	1189.30	1200.00	36.59
Weight(g)							
Average	Final	body	2705.03	2728.11	2801.10	2805.01	24.05
Weight(g)							
Average daily weight gain (g)			56.95	57.71	57.57	57.32	1.03
Average Feed Intake (g/d)			130.00	133.11	139.07	131.01	2.11
Feed Conversion ratio(gfeed/ggain)			2.32	2.30	2.28	2.29	0.16
Mortality			0.00	0.00	0.00	0.00	

Table 4: Haematological Indices of finisher broiler Sundried fed Yam Peel meal

Haematological parameter	Diet 1 (0%)	Diet 2 (10% IMS)	Diet 3 (20% IMS)	Diet 4 (30% IMS)	SEM
WBC (mm) ²	7.21x10 ⁵	7.27x10 ⁵	7.57x10 ⁵	7.41x10 ⁵	3.95x10 ⁵
RBC (10 ⁶ /ul)	2.37x10 ⁶	2.56x10 ⁶	2.58x10 ⁶	2.37x10 ⁶	1.02x10 ⁶
HB(g/dl)	9.33	10.13	9.90	9.30	1.23
MCHC (g)	29.97	29.73	28.81	28.93	4.01
PCV(%)	31.13	34.10	33.27	31.47	1.34
Lymphocyte (%)	96.80	97.13	96.37	97.10	12.01
Neutrophils (%)	91.10	90.67	92.07	97.20	3.41

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