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Performance and Blood Constituents of Crossbred Weaned Pigs As Affected By Mixed Sawdust Based Diets

Ogunbode AA*, Adebola AI, Olalere OE

Department of Animal Production Technology, Oyo State College of Agriculture and Technology, Igboora, Nigeria

ABSTRACT

The blood Food feed competition between human and animals has necessitated farmers to turn to alternative feed resources such as mixed sawdust. Thus the effects of diets containing graded level of mixed sawdust on performance and blood indices of pigs was evaluated using eighteen (18) crossbred (Large white x Landrace) weaned pigs that were randomly assigned into three (3) experimental groups of six replicates each. The mixed sawdust was incorporated into the diets using a completely randomized design. There were significant ($p<0.05$) variations in performance parameters and blood indices. Performance parameters measured were feed intake, weight gain, feed conversion ratio. Feed intake was highest in T_1 (822.19 kg) while the lowest value recorded was obtained in pig fed diet 3 (822.7 kg). The best feed conversion ratio (1.80) was obtained in pigs fed diet 3 (10% sawdust). At the end of the feeding trial, blood samples were collected from two animals per treatment for blood analyses. The results show that there was significant ($P<O.O5$) difference on hemoglobin, packed cell volume, red blood cell and white blood cells while white blood cell differentials count show no significant ($p>0.05$) variation. Pigs fed diets containing 10% mixed sawdust had significantly ($P<0.05$) higher hemoglobin, packed cell volume, red blood cells and white blood cell. Inclusion of mixed sawdust in the diet significantly ($P<0.05$) decreased the white blood cell differential counts when compared with the control diet. There were no significant ($p>0.05$) differences in the biochemical analysis of the pigs fed mixed sawdust based diet. It was concluded that mixed sawdust can be included in the diets of pigs up to 10% without any deleterious effect on the performance and blood indices of pigs.

Keywords: Food feed; sawdust; deleterious; blood indices; blood analyses; feeding trial

INTRODUCTION

Pig production provides means by which rapid transformation of animal protein can be achieved. Although pigs production are frequently hindered by some cultural and religious taboo, they possess several good attributes including high prolificacy, high fecundity, short generation interval, early maturity, high feed conversion efficiency and a modest requirement with respect to housing and equipment. Despite these attributes of pig production, high cost of feed increases the price of pork beyond the reach of the average consumer. The cost of livestock feeds alone account for about 70% of the total cost of production of monogastric animals and this has led to unprofitable livestock production. The rapid increase in the price of orthodox feed ingredients in Nigeria has led to an increase in the total cost of intensive pig production. The resultant effect is high cost of animal protein hence inability of the populace to meet the minimum dietary protein intake

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Corresponding author Ogunbode AA, Department of Animal Production Technology, Oyo State College of Agriculture and Technology, Igboora, Nigeria; E-mail: aaogunbode@gmail.com

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of 56 g per person per day as recommended by FAO. Large quantities of agro-industrial wastes such as sawdust which are not being effectively utilized especially for feeding are produced in large quantities annually in the tropics and are thereby constituting environmental and health hazards. Sawdust is a product resulting from cutting, grinding, drilling or pulverizing wood with saw or other tool, it is compose of fine particles of wood, it could also be derived from certain animals, birds or insects which live in wood, such as wood pecker and carpenter ant and it is abundant throughout year. Nigeria is endowed with abundant forest reserves, most of which are located in the southwestern part of the country. There has been significant increase in the number of sawmills in this region of the country with Lagos, Oyo, Osun, Ondo and Ogun states having the largest number. This is as a result of the need to satisfy the growing demands for wood for building and other construction purposes. The saw millers typically fell timber from the forest, transport them to their mills and saw the timber into lumber of various dimensions. In the process, sawdust and other wood waste such as wood bark, slab, log-ends etc are produced. Nigeria has an estimated wood waste generation of about 1,000,000 m^3 annually between 2009 and 2010 with sawdust amounting to about 1.8 million tons annually (4931.51 tons per day) reported that the total quantity of sawdust generated in the southwestern region of Nigeria annually as 526,650 metric tonnes. The natural degradation of sawdust is very slow and it is a waste of low use nowadays. Its storage is creating serious pollution problems in the soils in which it is settled because it occupies a lot of space, sawdust causes considerable environmental problems. However, in the last few years back, the efforts to find alternatives for its utilization in order to obtain new high value products have increased. One of its advantages as feed resource is that the sawdust does not compete directly with the food destined for human consumption. Many of these unconventional feed ingredients are fed to livestock without consideration to their health and physiological implication on the animal. A readily available and fast means of assessing clinical and nutritional status of the animal on feeding trial is the use of blood analysis. Hematological and serological profile are helpful in evaluation of pigs health and also provides valuable information on presence of metabolites and other constituents which are instrumental for detecting conditions of stress reported that 35% substitution level of mixed sawdust could effectively be substituted for wheat offal without adverse effect on the health status of broilers. It had also been reported that 10%inclusion level of mixed sawdust as a substitute for wheat offal had no deleterious effect on the internal organ of grower rabbit. Therefore, this study was conducted to assess the influence of dietary inclusion of mixed sawdust on performance and blood indices of crossbred weaned pigs [1-6].

MATERIALS AND METHODS

The experiment was carried out at the piggery unit of the Teaching and Research Farm of the Oyo State College of Agriculture and Technology Igboora, Nigeria. The experimental area lies in Savannah forest zone at latitude 7°. 43N and longitude 3°.28E in an elevation of 140 m above sea level. The average minimum temperature is above 21.5°C and maximum average temperature is about 32 5°C (Google Earth, 2019). The test ingredient (sawdust) was collected in its dried form from a saw-mill in Igboole, Igboora after which dirts and unwanted materials was removed from sawdust before it was then included in the diet of the experimental animals. Eighteen (18) crossbred (Large white X Landrace) weaned pigs in their 8th weeks of age was obtained from the piggery unit of the Oyo State College of Agriculture and Technology, Igboora. The pigs were injected with ivomec (0.5 ml per pig) subcutaneously against ecto and end parasite and fed 4% of their body weight as feed per day and the feed intake was increased as the animals increased in age and water was supplied ad libitum. The pigs were allowed seven (7) days acclimatization and the animals were fed twice daily. The experiment lasted eight (8) weeks. Diets were formulated to meet the nutrient requirements of the weaned pigs. Three experimental diets were formulated to contain graded levels of mixed sawdust. Treatment one (T_1) was the control without mixed sawdust while treatments T_2 and T_3 contained 5% and 10% mixed sawdust respectively [7-12]. Gross composition of the experimental diets is presented in **Table 1**.

Table 1: Gross composition of experiment diet.

Ingredients	T_1 (0%)	T_2 (5%)	T_3 (10%)
Maize	35	35	35
Corn bran	20.5	20.5	20.5
Wheat offal	10	5	0
Mixed saw dust	0	5	10
GNC	25	25	25
Fish meal	4.5	4.5	4.5
Bone meal	4	4	4

Lysine	0.25	0.25	0.25
Methionine	0.25	0.25	0.25
Salt	0.25	0.25	0.25
Grower	0.25	0.25	0.25
TOTAL	100	100	100
Determined Proximate Composition			
Parameters			
Dry matter (%)	89	90	89
Moisture (%)	11	10	11
Ether extract (%)	11.5	8	9.5
Ash (%)	8.89	8.48	9.2
Crude fibre (%)	7.68	7.33	7.9
Crude protein (%)	9.05	8.6	9.34
Nitrogen free extract	62.89	67.6	64.24

GNC: Groundnut cake

Experimental design used was Completely Randomized Design (CRD). Initial weights were taken and subsequent live weights were recorded weekly using a hanging spring balance. Total weight gain was calculated as final live weight minus initial live weight. Feed intake was obtained as the difference between the total quantities of feed offered and the quantity not consumed, feed conversion ratio was computed by dividing the daily feed intake by the daily weight gain. Blood samples were collected at the end of feeding trial through the ear vein using a sterile syringe and needle. Blood sample per pig was collected into two sets of labeled sterilized bottles. One set contained anti-coagulant (EDTA–Ethyl-Diamine Tetra Acetic Acid powder), while the other set did not. The set of bottles containing anticoagulant was used to determine the values of hematological indices such as size of Hemoglobin (Hb), Packed Cell Volume (PCV), Red Blood Cell (RBC), White Blood Cell (WBC), and Platelets. Values obtained were used to calculate Mean Corpuscular Volume (MCV), Mean Corpuscular Hemoglobin (MCH) and Mean Corpuscular Hemoglobin Concentration (MCHC) [13-16].

Mean Corpuscular Volume (MCV)=PCV x 10/RBC

Mean Corpuscular Haemoglobin (MCH)=Hb x 10/RBC

Mean Corpuscular Haemoglobin Concentration (MCHC)=Hb x 100/PCV.

The set of bottles without anti-coagulant was used to determine the serological indices such as total protein, albumin, globulin and total bilirubin using bromocresol green method. Chemical analysis of the experimental diets and mixed sawdust were determined according to the method of (AOAC, 2005). Data on live weights and blood indices were subjected to one-way analysis of variance. (SAS 2012) and the means were separated using Duncan Multiple Range Test (Duncan, 1955).

RESULTS

The results of growth performance of crossbred weaned pigs fed mixed sawdust based diets are presented in **Table 2**. The highest value (48.00 kg) for initial weight gain was obtained in pigs fed diet 3 (10% sawdust) while the lowest value (40.50 kg) was recorded for pigs fed diet 1 (0% sawdust). Final weight gain was highest in pigs fed diet 2 (413.5 Kg) while T_1 had the lowest value (403.3 kg). The best feed conversion ratio (1.80) was recorded for pigs fed diet 2 (5% sawdust) and diet 3 (10% sawdust) respectively. Hemoglobin concentration ranged from 7.07 to 11.60. Pigs fed diet 3 (10% sawdust) had the highest value (35.67) of packed cell volume while the least value (24.00) was obtained in diet T_2. White blood cell, red blood cell and platelets were found to be highest in pigs fed diet T_3 [17-22].

DISCUSSION

There was significant ($p<0.05$) difference in the final weight across the dietary treatment with pigs maintained on diet T_2 having the highest value (413.5 kg) while pigs on the control diet had the lowest value (403.3 kg). This could be attributed to the presence of certain unidentified growth factors contributed by mixed sawdust since the diets were similar except for control diet. Certain phenolic compounds of lignin have antibiotic-like properties and various fractions isolated from wood hemicellulose extract resulted in improvement of performance of chicks when

incorporated into corn-soybean meal diet. There was no significant (p>0.05) difference in the daily weight gain, feed intake and feed conversion ratio across the dietary treatment. The data obtained on daily weight indicated that T_2 (5% inclusion level of mixed sawdust) had the highest value (8.14) while the control diet had the least (7.93). The result obtained on feed conversion ratio showed no significant difference (p>0.05) but pigs on 5% and 10% inclusion level of mixed sawdust had a better value of 1.80 compared to the control diet. It is known that the methods of processing have profound effect on the utilization of fibre. Milling or wet processing exposes fibre to attack by micro-organisms to some extent thereby leading to its digestibility. The milling and partial fermentation processes that the test ingredient might have been subjected to in the sawmill before collection and sun drying could have had some effects on its intake when incorporated into the experimental diets. Also high fibre contents of these diets might have been responsible for high feed intake of pigs assigned to the treatments since the fibre levels of the experimental diets increased correspondingly as the sawdust inclusion level increased [23-25].

Table 2: Performance characteristics of pigs fed mixed sawdust based diet.

Parameters	T_1 (0%)	T_2 (5%)	T_3 (10%)	SEM
Initial weight	40.50^c	42.50^b	48.00^a	1.83
Final weight	403.5^c	413.5^a	407.0^b	2.39
DWG	7.93	8.14	8.12	0.05
Feed intake	822.2	822.8	822.7	1.15
FCR	1.85	1.8	1.8	0.01

Note: Daily Weight Gain (DWG) Feed Conversion Ratio (FCR); a,b,c means on the same row with different superscript different significantly.

Haematological indices of crossbred weaned pigs fed mixed sawdust based diet

Results of the hematological indices of crossbred weaned pigs fed mixed sawdust based diets are shown in **Table 3**. The dietary treatments influenced (p<0.05) the Hemoglobin (HB), Packed Cell Volume (PCV), Red Blood Cell (RBC) and white blood cell (WBC). The crossbred weaned pigs fed 10% mixed sawdust based diet had the highest (p<0.05) values for hemoglobin, packed cell volume, red blood cell and white blood cell. However, pigs fed the control diets compared favorably with pigs on the mixed sawdust based diets for platelets, mean corpuscular volume, mean corpuscular hemoglobin and mean corpuscular hemoglobin concentration. Aletor and and Egberongbe, reported that the blood variables most often influenced by dietary treatments were identified as red blood cell, packed cell volume, plasma protein, glucose and clotting time. The hemoglobin, packed cell volume, red blood cell and white blood cell values were within the normal ranges (10-16 g/dl), (32-50%), (5-10 10^6/ul) and (7-20 10^3/ul). High hemoglobin, packed cell volume and red blood cell improved oxygen carrying capacity of the cells which result in better availability of nutrients. The increased Packed Cell Volume (PCV), Hemoglobin (Hb) and Red Blood Cell (RBC) observed across the treatments indicates that all the diets did not waiver in protein quality and quantity. It also indicates the absence of normocytic anaemia, leukopenia or leukocytosis which is only detected by a decreased number of red blood cell or packed cell volume. Although there were no difference among dietary treatments for mean corpuscular volume, mean corpuscular hemoglobin and mean corpuscular hemoglobin concentration, their values were within the normal ranges (50-68 fl), (17-23 pg) and (30-36 g/dl). This observation agreed with the findings of Fasuyi and Aletor. They reported no significant (p>0.05) differences in mean corpuscular volume, mean corpuscular hemoglobin and mean corpuscular hemoglobin concentration when cassava leaf protein concentrate replaced fishmeal in broiler diets.

Table 3: Hematological characteristics of weaned pigs fed varying levels of mixed sawdust based diet.

Parameters	T_1 (0%)	T_2 (5%)	T_3 (10%)	± SEM
Haemoglobin	8.97^b	7.07^c	11.60^a	1.07
Packed cell volume	27.67^c	24.00^b	35.67^a	2.81
Red blood cell	4.36^b	3.74^c	5.90^a	0.52
White blood cell	4666.67^c	5400.00^{ab}	5433.33^a	204.27
Platelets	93000^{ab}	94667^a	11300^c	22466.21

MCV	63.55[ab]	63.92[a]	60.48[c]	0.89
MCH	20.58[a]	19.26[c]	19.66[ab]	0.32
MCHC	32.36[ab]	30.00[c]	32.49[a]	0.66

MCV: Mean Corpuscular Volume; MCH: Mean Corpuscular Haemoglobin; MCHC: Mean Corpuscular Haemoglobin Concentration

a,b,c means on the same row with different superscript different significantly.

Serum indices of crossbred weaned pigs fed mixed sawdust based diet

¢KŜ ăŜNdzY ōλ2ŎKŜYλŎI·f λyŘλŎŜă 2Ŧ ŎN2ăăōNŜŘ ǿŜI·yŜŘ LJλƎă ŦŜŘ ƎNI·ŘŜŘ fŜØŜfă 2Ŧ YλÈŜŘ ăI·ǿŘdzăΰ I·NŜ ăK2ǿy´ λy´ Table 4Φ ¢KŜ ăI·ǿŘdzăΰçōI·ăŜŘ ŘλŜΰă Ř2Ŝă yƵΰ λyƬfdzŜyŎŜŘ ótƁлΦлрú ΰKŜ ăŜNdzY Y´ŜΰI·ō2fλΰŜă 2Ŧ ΰKŜ ŎN2ăăōNŜŘ ǿŜI·yŜŘ LJλƎΦ ¢2ΰI·f LJN2ΰŜλy´ØI·fdzŜă NI·yƎŜŘ ŦN2Y´ ócΦτθ̂ˆ πτΦлл ƎkŘfú ōdzΰ I·NŜ f2ǿŜN ΰKI·y´ ótΦnπyΦф ƎkŘfú NŜLJ2NΰŜŘ ōè ów!wΣ нллcúΦ ¢KŜ ØI·fdzŜă 2Ŧ I·fōdzY´λy´ óнΦτлπнΦфo ƎkŘfúΦ tλƎă 2y´ ŘλŜΰ o KI·Ř ΰKŜ KλƎKŜăΰ I·fōdzY´λy´ ØI·fdzŜ óнΦфθ̂ˆ ú ǿKλfŜ ΰKŜ fŜI·ăΰ ØI·fdzŜ óнΦτ±̂ˆ ú ǿI·ă 2ōΰI·λyŜŘ 2y´ LJλƎă YI·λyΰI·λyŜŘ 2y´ ŘλŜΰ нΦ Df2ōdzfλy´ ǿI·ă KλƎKŜăΰ λy´ LJλƎă ŦŜŘ ΰKŜ Ŏ2yΰN2f ŘλŜΰ ǿKλfŜ LJλƎă 2y´ ŘλŜΰ н NŜŎ2NŘŜŘ ΰKŜ fŜI·ăΰ ØI·fdzŜ óпΦлθ̂ˆ úΦ C2N ΰ2ΰI·f ōλfNdzōλy´ LJλƎă 2y´ ΰKŜ Ŏ2yΰN2f ŘλŜΰ Ŏ2YLJI·NŜŘ ŦI·Ø2dzNI·ōfè ǿλΰK LJλƎă 2y´ ΰKŜ ŜÈLJŜNλYŜyΰI·f ŘλŜΰă {ŜNdzY LJN2ΰŜλyã KI·ØŜ ōŜŜy´ λŘŜyΰλƬλŜŘ ΰ2 ōŜ Ǝ22Ř λyŘλŎI·ΰ2Nă 2Ŧ ΰKŜ YŜΰI·ō2fλăY´ 2Ŧ λyƎŜăΰŜŘ ŦŜŜŘăΣ ăΰI·ΰŜ 2Ŧ ō2Řè ŎŜffăΣ ΰλăădzŜă I·yŘ 2NƎI·yãΦ LYLJN2ØŜŘ ØI·fdzŜă 2Ŧ ăŜNdzY´ ΰ2ΰI·f LJN2ΰŜλy´2ōăŜNØŜŘ ǿλΰK LJλƎă ŦŜŘ мΣ̂ˆ Ŏ2YLJI·NŜŘ ΰ2 ΰKŜ Ŏ2yΰN2f ŘλŜΰ ǿI·ă I·y´ λyŘλŎI·ΰλ2y´ ΰKI·ΰ ΰKŜ ŘλŜΰI·Nè LJN2ΰŜλy´ ăΰI·ΰdză 2Ŧ ΰKŜ I·yƬY´I·fãΦ Df2ōdzfλy´ ŎI·NNλŜă ŜăăŜyΰλI·f YŜΰI·tă ΰKN2dzƎK ΰKŜ ōf22ŘăΰNŜI·Y´ ΰ2 ΰKŜ ØI·Nλ2dză LJI·Nΰă 2Ŧ ΰKŜ ō2Řè 2Ŧ ŦI·NY´ I·yλYI·fãΦ Lΰ KŜfLJă ΰ2 ŦλƎKΰ λyŦŜŎΰλ2yã λy´ ΰKŜ ō2Řè 2Ŧ I·yλYI·fãΦ ¢KŜNŜŦ2NŜ KλƎK Ǝf2ōdzfλy´ fŜØŜfă I·NŜ 2ŦΰŜy´ LJN2y2dzyŎŜŘ λy´ LJλƎă ǿλΰK ăŜN2dză λyŦŜŎΰλ2yã ōŜŎI·dzăŜ 2Ŧ I·ōy2NY´I·ffè λyŎNŜI·ăŜŘ LJN2ŘdzŎΰλ2y´ 2Ŧ I·yΰλō2ŘλŜăΦ ¢KŜ ØI·fdzŜă 2Ŧ Ǝf2ōdzfλy´2ōăŜNØŜŘ λy´ ΰKλă ăΰdzŘè NŜØŜI·fŜŘ ΰKI·ΰ ΰKŜ λyŎfdzăλ2y´2Ŧ ăI·ǿŘdzăΰ λy´ ΰKŜ ǿŜI·yŜŘ LJλƎ ŘλŜΰ ŘλŘ yƵΰ LJNNŜŎλLJλΰI·ΰŜ I·yê ăŜØŜNŜ ŜŦŦŜŎΰă 2y´ ΰKŜ KŜI·fΰK ăΰI·ΰdză 2Ŧ ΰKŜ LJλƎăΦ

Table 4: {ŜNdzY´ ōλ2ŎKŜYλŎI·f LJI·NI·Y´ŜΰŜNă 2Ŧ ǿŜI·yŜŘ LJλƎă ŦŜŘ ØI·NèλyƎ fŜØŜf 2Ŧ YλÈŜŘ ăI·ǿŘdzăΰ ōI·ăŜŘ ŘλŜΰΦ

Parameters	T_1 (0%)	T_2 (5%)	T_3 (10%)	SEM
Total Protein (g/l)	6.97	6.73	7	0.07
Albumin (g/l)	2.83	2.7	2.93	0.05
Globulin (g/l)	4.13	4.03	4.07	0.02
TB (g/l)	0.13	0.13	0.13	0

T B=Total Bilirubin

CONCLUSION

LyŎfdzăλ2y´ 2Ŧ YλÈŜŘ ăI·ǿŘdzăΰ λy´ ΰKŜ ŘλŜΰ ăλƎyƬλŎI·yΰfè ótƒлΦлрú ŘŜŎNŜI·ăŜŘ ΰKŜ ǿKλΰŜ ōf22Ř ŎŜff ŘλƬŦŜNŜyΰλI·f Ŏ2dzyΰă ǿKŜy´ Ŏ2YLJI·NŜŘ ǿλΰK ΰKŜ Ŏ2yΰN2f ŘλŜΰΦ ¢KŜNŜ ǿŜNŜ y2 ăλƎyƬλŎI·yΰ ólJƁлΦлрú ŘλƬŦŜNŜyŎŜă λy´ ΰKŜ ōλ2ŎKŜYλŎI·f I·yI·fèăλă 2Ŧ ΰKŜ LJλƎă ŦŜŘ YλÈŜŘ ăI·ǿŘdzăΰ ōI·ăŜŘ ŘλŜΰΦ Lΰ ǿI·ă Ŏ2yŎfdzŘŜŘ ΰKI·ΰ YλÈŜŘ ăI·ǿŘdzăΰ ŎI·y´ ōŜ λyŎfdzŘŜŘ λy´ ΰKŜ ŘλŜΰă 2Ŧ LJλƎă dzLJ ΰ2 мΣ̂ˆ ǿλΰK2dzΰ I·yê ŘŜtŜΰŜNλ2dză ŜŦŦŜŎΰ 2y´ ΰKŜ LJŜNŦ2NY´I·yŎŜ I·yŘ ōf22Ř λyŘλŎŜă 2Ŧ LJλƎăΦ

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¢KŜ I·dzΰK2Nă ǿλăK ΰ2 ΰKI·yƬ ΰKŜ ΰŜŎKyλŎI·f ăΰI·ŦŦ I·yŘ ŦI·NY´ I·ΰΰŜyŘI·yΰ Ŧ2N I·ff LJNI·ŎΰλŎI·f KŜfLJ ǿλΰK ΰKŜ Ŏ2yŘdzŎΰ 2Ŧ ΰKŜ ΰNλI·fΦ ΰKŜ Ŏ2yΰN2f ŘλŜΰ ǿI·ă I·y´ λyŘλŎI·ΰλ2y´ ΰKI·ΰ ΰKŜ ŘλŜΰI·Nè LJN2ΰŜλy´ ŎdzΰλfλÎŜŘ ōè ΰKŜ I·yλYI·fãΦ YŜfŦè NŜLJ2NΰŜŘ ΰKI·ΰ ăŜNdzY´ I·fōdzY´λy´ λă dzăŜŘ ΰ2 Y´ŜI·ădzNŜŘ ΰKŜ I·Y´2dzyΰ I·yŘ ΰèLJŜ 2Ŧ ăŜNdzY´ LJN2ΰŜλy´ λy´ ΰKŜ ōf22Ř ǿKλŎK λă I·y´ λyŘŜÈ 2Ŧ KŜI·fΰK I·yŘ yƵzΰNλΰλ2yΦ {ŜNdzY´ I·fōdzY´λy´ ØI·fdzŜă 2ōΰI·λyŜŘ Ŏ2YLJI·NŜŘ ŦI·Ø2dzNI·ōfè ǿλΰK ΰKŜ Ŏ2yΰN2f ŘλŜΰ λY´LJfλŜă ΰKI·ΰ ΰKŜ ŘλŜΰI·Nè LJN2ΰŜλyã λy´ ΰKŜ ŜÈLJŜNλYŜyΰI·f ŘλŜΰă I·NŜ Ŝy2dzƎK ΰ2 ădzLJLJ2Nΰ ΰKŜ yƵzΰNλΰλ2y´ I·yŘ KŜI·fΰK ăΰI·ΰdză 2Ŧ ΰKŜ I·yλYI·fãΦ Df2ōdzfλy´ ŎI·NNλŜă ŜăăŜyΰλI·f YŜΰI·tă ΰKN2dzƎK ΰKŜ ōf22ŘăΰNŜI·Y´ ΰ2 ΰKŜ ØI·Nλ2dză LJI·Nΰă 2Ŧ ΰKŜ ō2Řè 2Ŧ ŦI·NY´ I·yλYI·fãΦ Lΰ KŜfLJă ΰ2 ŦλƎKΰ λyŦŜŎΰλ2yã λy´ ΰKŜ ō2Řè 2Ŧ I·yλYI·fãΦ ¢KŜNŜŦ2NŜ KλƎK Ǝf2ōdzfλy´ fŜØŜfă I·NŜ 2ŦΰŜy´ LJN2y2dzyŎŜŘ λy´ LJλƎă ǿλΰK ăŜN2dză λyŦŜŎΰλ2yã ōŜŎI·dzăŜ 2Ŧ I·ōy2NY´I·ffè λyŎNŜI·ăŜŘ LJN2ŘdzŎΰλ2y´ 2Ŧ I·yΰλō2ŘλŜăΦ ¢KŜ ØI·fdzŜă 2Ŧ Ǝf2ōdzfλy´2ōăŜNØŜŘ λy´ ΰKλă ăΰdzŘè NŜØŜI·fŜŘ ΰKI·ΰ ΰKŜ λyŎfdzăλ2y´2Ŧ ăI·ǿŘdzăΰ λy´ ΰKŜ ǿŜI·yŜŘ LJλƎ ŘλŜΰ ŘλŘ yƵΰ LJNNŜŎλLJλΰI·ΰŜ I·yê ăŜØŜNŜ ŜŦŦŜŎΰă 2y´ ΰKŜ KŜI·fΰK ăΰI·ΰdză 2Ŧ ΰKŜ LJλƎăΦ

REFERENCES

мΦ !ŘŜNŜYλ C! óнллпú 9ŦŦŜŎΰă 2Ŧ NŜLJfI·ŎŜY´Ŝyΰ 2Ŧ ǿKŜI·ΰ ōNI·y´ ǿλΰK /I·ăăI·ØI· N22ΰ ăλŜØI·ΰŜ ădzLJLJfŜY´ŜyΰŜŘ 2N dzyãdzLJLJfŜY´ŜyΰŜŘ ǿλΰK ŜyΓèY´Ŝ 2y´ ΰKŜ KI·ŜY´I·ΰ2f2Ǝè I·yŘ ăŜNdzY´ ŎλŽŎKŜY´λăΰNè 2Ŧ LJdzffŜΰă ŎKλŎΓąΦ ¢N2LJ W !yλY´ {ŎλΦ тóмύYмпттмрo

нΦ Afolabi KD, Akinsoyinu AO, Olajide R, Akinleye SB (2010) Haematological Parameters of the Nigerian Local Grower Chickens Fed Varying Dietary Levels of Palm Kernel Cake. Proceedings of 35th Annual Conference of Nigerian Society for Animal Production, Ibadan, 247-248.

оΦ !Ǝō22fI· ! ómффoú {2λf 2NƎI·yλŎ Y´I·ΰΰŜNJ I·yŘ λΰă Ŏ2yăŜNØI·ΰλ2y´ for increased productivity in Nigeria. Proceedings of a Conference on Environmental Resources Management in

Nigeria, Port Harcourt, Nigeria

4. Akinfala EO, Adegbaju SW, Ilori JO (2013) Evaluation of the nutritive value of whole cassava plant as a replacement for maize in the diets of growing pigs in the tropics. Ife J Agri. 26(1):15-22.
5. AOAC (2005) Association of Official Analytical Chemists. Official Methods of Analysis. 18th Ed, Washington DC, USA.
6. Aro SO, Ogunwale FF, Falade OA (2013) Blood viscosity of finisher cockerels fed dietary inclusions of fermented Cassava tuber wastes. Proceedings of 18th Annual Conference of Animal Science Association of Nigeria. 74-77.
7. Cullis J (2011) Diagnosis and management of anaemia of chronic disease: Current status. Br J Haematol. 154 (3): 289-300
8. Duncan DB (1955) Multiple Ranges and Multiple F-Test. Biometrics.11(1):1-42.
9. Etim NN, Enyenihi GE, Akpabio U, Offiong EEA (2014) Effects of nutrition on haematology of rabbits. A Review. Eur Sci J. 10(3):1857-7881.
10. Fasuyi, AO (2005) Nutrient Composition and Processing effects on Cassava leaf (Manihot esculenta, cratz) anti-nutrients. Pak J Nutr. 4(1):37-42.
11. Fatufe AA, Akanbi IO, Saba GA, Olowofeso O, Tewe OO (2007). Growth performance and Nutrient Digestibility of growing pigs fed a mixture of palm kernel meal and cassava peel meal. Livest Res Rural Dev. 19(12):1-9.
12. Hamzat RA, Babatunde BB (2001) Performance characteristics of broiler finisher fed Cola nitida pod husk based diet. Moor J Agric Res. 2(2):158.
13. Hossain ME, Rahman MJ, Islam KMF (2012) Nutritive value of sawdust. J Anim Feed Sci. 2 (3):288-291.
14. Kelly WR (1979) Veterinary Clinical Diagnosis. 2nd Ed, Bailliere Tindall, London, UK. 266-267.
15. Murray RK, Granner DK, Mayes PA, Rodwell VM (2000) Harpers biochemistry 25th edition McGraw-Hill Health Profession Division, USA.
16. Ogbuewu IP (2012) Studies on the physiological responses of rabbits to ginger (*Zingiber officinale*) rhizome powder. Thesis Federal University of Technology, Owerri, Nigeria.
17. Ogbuewu IP, Kadurumba OE, Okoli IC, Iloeje MU (2013) Effect of ginger rhizome powder supplement and sex on haematological indices of pre-pubertal rabbits. J Agric Sci Technol. 9(13):11-19.
18. Okai DB, Topps JH, English P, Tuah AK, Osafo ELK (1995) The effects of processed sheanut cake and groundnut skins on the growth performance and organ characteristics of rats. Biotechnol Mol Biol. 3(95):76-82.
19. Okedere OB (2016) an assessment of air emissions from open burning of some common southwestern Nigeria wood dust in the country's energy mix (Unpublished PhD Thesis). Department of Chemical Engineering, Obafemi Awolowo University, Ile Ife, Nigeria.
20. Olabanji RO, Ojebiyi OO, Tona GO, Olagun O (2009) Hematological and Serum Biochemical response of growing rabbits fed diets containing processed mango (*Mangifera indica*) seed kernel meal. Proceeding s of the 14th Annual Conference of Animal Science Association of Nigeria. September 14-17, 2009, Ogbomoso, Nigeria. 170-173.
21. Olugbemi TS, Mutayoba SK, Lekule FP (2010) Effect of moringa (*Moringa oleifera*) inclusion in cassava based diets fed to broiler chickens. Int J Poult Sci. 9(4):363-367.
22. SAS (2012). Statistical Analytical Software User's Guide. Static version 9.2. Ed. SAS institute Inc. Cary
23. Shaahu DT, Ayoade JA, Ate ME (2014) Carcass characteristics, hematological parameters and reproductive tract morphometric of rabbits fed cassava leaf meal. J Agric Vet Sci. 7(5):2319-2372.
24. Zheng W, Phoungthong K, Lu F, Shao LM, He PJ (2013) Evaluation of a classification method for biodegradable solid wastes using anaerobic degradation parameters. J Bioremed Biodeg. 33(12):2632-2640.