

*Full Length Research Paper*

# Effects of cassava pulp sievate meal as feed ingredient on the haematological values of finisher broiler birds

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Sixty - 28 days old unsexed marshal breed of finisher broiler birds were used in four weeks feeding trial to assess the effects of Cassava pulp seviate meal (CPSM) as energy feed ingredient on hematological profile of the birds. The birds were randomly allotted to four treatment diets with four varying levels of (CPSM) as T<sub>1</sub> (0% CPSM), T<sub>2</sub> (10% CPSM), T<sub>3</sub> (20% CPSM), and T<sub>4</sub> (30% CPSM) respectively. The birds were as well divided into three treatment groups of 15 birds per group and each group was further replicated three times in a completely randomized design of five birds per replicate. Drinking water and feed were supplied regularly, while adequate sanitation and medication programs were carried out. At the fourth week of the feeding trial, two birds were randomly selected from each replicate and 10 ml of blood were collected from each bird with 10 ml sterile syringe. The blood sample collected was used to assess the haematological values of the experimental birds. However, the results obtained from the experiment, indicated that the haematological values of the experimental birds decreased as the inclusion levels of cassava pulp seviate meal increased in their diets even though it did not show any deleterious effect on the birds. However, the result showed that 20% of cassava pulp seviate meal could be included in the finisher broiler diet without any deleterious effect on the birds' general health and performance. The result also showed that above 20% (CPSM) in Finisher broiler birds' diet, the haematological values were affected which invariably resulted to the poor performance of the birds placed at the high level of CPSM. However, 20% cassava pulp sievate appears to be the optimal inclusion level in finisher broiler birds.

**Key words:** Cassava pulp seviate meal, maize meal, haematological indices and finisher broilers.

## INTRODUCTION

Energy, Protein, Fats, Water, Vitamins and Minerals make up poultry diets. However, energy is the most expensive part of poultry diet and constitutes up to 60 to 75% of the total diet (Ahaotu et al., 2013; Perrin et al., 2000). Dietary nutrients that yield energy are

carbohydrates, fats and energy. They are the main factors that influence feed intake as birds under normal circumstance eat to satisfy their energy need (Faniyi 2002; Madubuike and Ekenyem, 2006). Carbohydrates form the largest part of the animal feed supply and make up to 70% of the dry weight of plant population upon which the animal life depends for its food supply (Kekeocha, 2001; Ahaotu et al., 2012). Researchers have recently discovered that agro by-products such as

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**Table 1.** Proximate composition of cassava pulp sievate.

<b>Nutrients</b>	<b>Percentage</b>
Dry Matter	85.50%
Crude Protein	3.36
Crude Fibre	17.59
Ether Extract	4.66
Ash	2.35
Moisture	18.32
Nitrogen Free Extract (NFE)	53.79
Hydrocyanide (HCM)	28g/100g

cassava pulp sievate, maize offal, wheat offal, cassava, yam and plantain peels, leaf meals and animal wastes which hitherto were discarded as waste are now used as livestock feed to partially or totally substitute a proportion of conventional energy and protein sources such as maize, soya bean and groundnut whose prices have risen (Ahaotu et al., 2011). However, these conventional feed ingredients and their high costs are also causing a hike in the costs of animal products such as eggs and meat (Isikwenu et al., 2000; Iheukwumere, 2001; Ahaotu et al., 2010). Consequently, adequate information on the nutritional values and suitability for use of these unconventional plant and animal by-products is very imperative. Cassava pulp sievate is one of the agro-by-products of great importance in animal nutrition which can also help to reduce the cost of poultry feed if adequately utilized (Kpata and Ojo, 2000; Ahaotu et al., 2009). It is that part of cassava tuber which is usually obtained when the outer cover (peel) of the tuber is removed. The sievate is whitish in colour and is obtained when tuber pulp is grated, put into a sack and subjected under pressure (heavy stone or wooden processing which when sieved the chaff is called sievate. However, this study assessed the effects of cassava pulp sievate meal as feed ingredient on the haematological values of finisher broiler birds.

## **MATERIALS AND METHODS**

### **Location of the experiment**

This study was carried out at the Teaching and Research Farm, Imo State University Owerri, Nigeria. It lies between latitude 5.35N and 6.10N and Longitude 6.40E and 7.11E.

### **Experimental diets**

Cassava pulp sievates were sourced from garri processing areas and rural farmers from Eche in Rivers

State and in Umuagwo, Ohaji Egbema Local Government of Imo State. The pulps were sun dried to reduce excess water and hydro cyanide content of the pulp sievate. The pulp sievate was milled with a medium size grinder (hand operated) and thereafter subjected to approximate analysis as outlined by AOAC (2000). This was used to replace maize at 0, 10, 20 and 30% levels for T<sub>1</sub>, T<sub>2</sub>, T<sub>3</sub> and T<sub>4</sub> respectively as shown in Table 2.

### **Experimental birds and designs**

A total of sixty (60) unsexed marshal breed of broiler chicks at 28 days old were used for this experiment. The birds were stabilized for 7 days with commercial broiler finisher mash. The birds were divided into four treatment groups of 15 birds per group and each was further divided into three replicates of 5 birds per replicate in a completely randomized design. Drinking water and feed were supplied *ad-libitum* while appropriate medication and other standard poultry management practices were scrupulously followed.

### **Data collection and analysis**

On the 28<sup>th</sup> day of the feed trial two birds were randomly selected from each replicate, starved of feed overnight but not water. 10 ml blood sample were collected from each bird through the wing vein, with 10 ml sterile syringe. The blood sample collected were used to assess the haematological values such as Packed Cell Volume (PCV), Mean Cell Volume (MCV), Mean Cell Hemoglobin Concentration (MCHC), Mean Cell Hemoglobin (MCH), Red Blood Cell Count (RBC), White Blood Cell Count (WBC), and Blood Clotting Time (BCT) according to the methods described in Merck Veterinary Manual (1986). All data generated were subjected to one-way analysis of variance, Steel and Torrie (1980), while significant means were separated using the Duncan's Multiple Range Test (1995) as outlined by Onuh and Igwemma, (2000) (Table 1).

**Table 2.** Ingredient composition of the experimental diet.

Ingredients	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>
Maize	55.0	45	35	25
Cassava pulp sievate	0.00	10.0	20.0	30.0
Groundnut cake	10.50	10.50	10.50	10.50
Soya Bean	9.00	9.00	9.00	9.00
Wheat Offal	10.50	10.50	10.50	10.50
Palm Kernel Cake	6.30	6.30	6.30	6.30
Fish Meal	8.00	8.00	8.00	8.00
Bone Meal	4.00	4.00	4.00	4.00
Common Salt	0.30	0.30	0.30	0.30
Premix	0.25	0.25	0.25	0.25
L-Lysine	0.09	0.09	0.09	0.09
DL-Methionine	0.06	0.06	0.06	0.06
Total	100.00	100.00	100.00	100.00

**Calculate nutrient levels of the experimental diets**

%	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>
Crude Protein	20.67	20.07	19.14	17.45
Crude Fibre	4.16	5.72	7.38	10.47
Calcium	3.03	3.06	3.08	3.11
Phosphorus	1.00	0.91	0.92	0.93
Gross E (Kcal/kg)	2861.62	2655.05	2620.00	2055.05
Ether Extract	4.15	4.22	4.30	4.35

**Table 3.** Haematological Indices of broiler finisher birds fed varying dietary levels of cassava pulp sievate meal.

Parameters	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	SEM
PVC (%)	37.20 <sup>a</sup>	36.30 <sup>a</sup>	34.20 <sup>b</sup>	31.30 <sup>c</sup>	0.33
HB (g/dl)	12.30 <sup>a</sup>	12.10 <sup>a</sup>	11.60 <sup>b</sup>	10.30 <sup>c</sup>	0.11
MCV (fl)	30.10 <sup>a</sup>	29.50 <sup>a</sup>	29.83 <sup>a</sup>	29.23 <sup>c</sup>	0.30
MCH (pg)	10.96 <sup>a</sup>	10.50 <sup>ab</sup>	10.20 <sup>b</sup>	10.00 <sup>c</sup>	0.17
MCHC (Pg)	31.50 <sup>a</sup>	30.30 <sup>b</sup>	30.00 <sup>b</sup>	28.80 <sup>c</sup>	0.20
WBC (x 10 <sup>3</sup> /μl)	5.30 <sup>a</sup>	5.03 <sup>a</sup>	4.50 <sup>b</sup>	3.50 <sup>c</sup>	0.10
RBC (x 10 <sup>5</sup> /μl)	7.20 <sup>a</sup>	6.73 <sup>b</sup>	5.38 <sup>c</sup>	4.30 <sup>d</sup>	0.11
CT (Secs)	10.16 <sup>c</sup>	10.30 <sup>c</sup>	11.10 <sup>d</sup>	11.63 <sup>a</sup>	0.01

**RESULTS AND DISCUSSION**

The results of the various parameters measured were presented in Table 3. The pack cell volume values obtained were 37.20, 36.30, 34.20, and 31.30% for birds on diets T<sub>1</sub>, T<sub>2</sub>, T<sub>3</sub> and T<sub>4</sub> respectively. There was no significant difference ( $p > 0.05$ ) between T<sub>1</sub> and T<sub>2</sub> on PCV values, however, T<sub>4</sub> and T<sub>3</sub> differed ( $p < 0.05$ ) significantly among themselves and had lower value among T<sub>1</sub> and T<sub>2</sub>. Mean Cell Hemoglobin (MCH). The values obtained for MCH were 10.96, 10.50, 10.20 and 10.00Pg for T<sub>1</sub>, T<sub>2</sub>, T<sub>3</sub> and T<sub>4</sub> respectively.

The values for birds on diet T<sub>2</sub> (10%) cassava pulp sievate meal was higher ( $p < 0.05$ ) than the values obtained from T<sub>3</sub> and T<sub>4</sub>, (20 and 30% CPSM) respectively. However, T<sub>1</sub> (0% CPSM) was highest ( $p < 0.05$ ) of all values obtained from other treatments. However, values obtained from MCHC, WBC and RBC, T<sub>1</sub> was highest followed by T<sub>2</sub> while T<sub>4</sub> was the least ( $p < 0.05$ ). Clothing time, T<sub>4</sub> was the longest, while T<sub>1</sub> had the lowest, ( $p < 0.05$ ) among the treatments. Short clothing time is of health importance in livestock management practices such as blood sample collection and other surgical and health implication practices such as

castration, debeaking, tattooing and docking. The longest clothing time obtained from T<sub>4</sub> (30% CPSM), indicated the shortage of thromboplastin that help blood clotting (thrombosis). The reduction in the haematological values for (PCV, HB, MCH, MCHC and RBC) birds on diets T<sub>4</sub>, could be traced to high fibre levels in their diets. Red blood cells play an important role in the circulation of oxygen in the body system which indicates decrease in the red blood results to decrease in the oxygen circulation in the body thereby resulting to low productivity in animals involved. However, decreased Haemoglobin (HB) level resulted to a decrease in iron content of the blood which could also result to ammonia even though the values obtained in this study were within the normal range for avian specie and had no serious dangerous effect on the experimental birds placed at T<sub>4</sub> diet (30% CPSM).

## Conclusion

The finisher broiler birds used in this study, tolerated up to 30% cassava pulp seviate meal in their diets even though haematological values declined at 30% (CPSM) inclusion level in the diet of the finisher broiler birds and resulted to low performance of the birds placed on that diet. However, 20% cassava pulp seviate meal was the optimal as energy source in the finisher broilers diet and also supported better performance from the good values of the haematological indices of the birds.

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