

## HAEMATOLOGICAL RESPONSE OF WEST AFRICAN DWARF GOATS FED CORNCOBS ENSILED WITH CASSAVA PEELS.

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### Abstract

A feeding trial was conducted to investigate the haematological response of West African Dwarf goat fed ensiled corncobs and cassava peels. Fifteen West African Dwarf goats with average initial body weight of  $7.09 \pm 0.1$  kg and 6-7 months old were balanced for weight and fed cassava peels (CPL), and ensiled corncobs (CC) in five different combinations as treatments, to determine their haematological response to the diets. Goats were randomly assigned to five dietary treatments in a completely randomized design (CRD) with three animals per treatment. The dietary treatments were as follows; (T1) 100% corncobs (CC), T2 (100% cassava peels), T3 (50% CPL + 50% CC); (T4) 25% corncobs + 75% cassava peels; (T5) 75% corncobs + 25% cassava peels. The crude protein value obtained were; 4.53%, 7.83%, 9.04%, 8.81%, 6.34% respectively. T3 shows the highest value while T1 shows the lowest value of crude protein. At the end of the experiment, two goats were randomly selected from each treatment and bled via jugular vein. It was observed that T3 recorded the highest values in Packed cell volume (27.00%), Haemoglobin (8.95), Red blood cell (4.36) and Neutrophils (31.50). Values obtained for white blood cell, Neutrophils, eosinophil and lymphocytes in this study were all within the normal range for clinically healthy goats. Results obtained indicated that the WAD goats possess protection system, providing a rapid and potent defence against any infection. Therefore, goats can be fed with mixture of ensiled corncobs and cassava peels at 50% each without any detrimental effects.

**Keywords:** Haematological, West African Dwarf goats, Corncoobs and Cassava peel silage.

### Introduction

Goats are multi-functional animals and play a significant role in the economy and nutrition of small and marginal farmers in most developing countries. Small ruminants especially goats can efficiently survive on available shrubs and trees in adverse harsh environment of low fertility land where no other crop can be grown. Feed cost is a major burden of livestock farms, thus, a major strategy to develop the livestock industry in developing countries could be to increase the use of locally available feed resources which can reduce the cost of importation.

Moreover, meeting the nutritional needs of ruminants throughout the year is a major challenge in the tropics due to seasonality of forages. Among the agro- industrial by products, cassava peel is the most abundant and has the greatest potential as a basal feedstuff for small ruminants. Agricultural waste is increasingly viewed as valuable resources though are usually fibrous, with poor quality nutrients which make their digestibility low. Ravindran, (1993) reported that cassava peels are rich in protein, minerals and vitamins as well as essential amino

acids except methionine and phenylalanine. Researchers have shown that different methods of preservation can be used to explore the benefits from cassava peels as ruminant feeds resources as well as reduce the effect of hydrocyanic glycoside. However, to improve the nutrient composition of the crude protein, biochemically treated cassava peel and corncobs silage meal is a high quality feed that contains a high concentration of energy, protein, and some mineral elements. Corncoobs are of little commercial value and no dietary importance to human beings hence they can be utilised by ruminants and be converted to animal products at no cost. Blood contains a myriad of metabolites and other constituents which provide a valuable medium for clinical investigation and nutritional status of human beings and animals. Dietary components have been reported (Olorode *et al.*, 1995) to have measurable effects on blood components; hence blood constituents are widely used in nutritional evaluation and survey of animals. The study was designed to investigate the dietary effects of ensiled corncobs and cassava peels on haematological indices of WAD goats.

### Materials and method

The experiment was carried out at the sheep and goat unit of Institute of Agricultural Research and Training, Moor Plantation, Ibadan which lasted for a period of 12 weeks. Fresh cassava peels was obtained at Kila area of Ogun state while corncobs was obtained at Omi –Adio market, Ibadan, Oyo state. The corncobs obtained was cracked using feedmill hammer after which it was soaked in water for 24 hours to make it succulent for quick fermentation process. After 24 hours, the soaked corncobs was mixed with fresh cassava peels and molasses was used as an additives. The diets were ensiled into polythene bags at 10kg per bag with 1kg additive which was put separately into five silos on a period of one month. Fifteen post weaned male West African Dwarf goats with average initial body weight of 7.09kg  $\pm$  0.1kg and 6-7 months old were purchased from Igbo- Ora area, Oyo state. The goats were vaccinated against ecto and endo parasites and randomly allotted to five dietary treatment groups with each treatment having three replicates in a completely randomized design. Pre- experimental body weights of the animals were recorded after which the animals were weighed weekly.

### Chemical and Statistical analysis

Samples of the experimental diets were analysed for their proximate and fibre composition. Proximate analysis of the experimental diets and test ingredients were carried out according to A.O.A.C.(1995) procedure. Data collected were subjected to analysis of variance using the procedure of SAS, (2002), significant treatment means were compared using Duncan option of the same software.

### Blood collection

At the end of the experiment, two goats per treatment were randomly selected and bled through the jugular vein into a carefully labelled sample bottle that has been pre- treated with ethylene diamine tetraacetic acid (EDTA) to prevent blood coagulation and taken to the laboratory to determine packed cell volume, RBC, WBC, Erythrocytes, Lymphocytes, haemoglobin.

### Results and Discussion

The proximate composition of the experimental diets is shown in Table 1. The amount of crude protein and ash contents in T1 4.53% and 2.36% respectively are the lowest. T3 had the highest value of crude protein (9.04%), crude fat (6.16%), crude fibre (29.79) and ash content of 5.91. Also, Nitrogen Free Extract and moisture content values of (43.26) and (5.84) were lowest in T3.

Table 2 shows the results of haematological parameters of West African Dwarf goats fed ensiled corn cobs and cassava peels. There were significant ( $P < 0.05$ ) effects of ensiled corn cobs and cassava peels on Packed cell volume, Haemoglobin, and Red blood cell. Goats fed with 50%CC + 50%CPL had the highest PCV value of 27.00%, Haemoglobin value of 8.95%, and Red blood cell value of 4.36% while the lowest PCV value of 15.50%, Haemoglobin value of 5.85% and RBC value of 2.45% were obtained in goats fed 100% corn cobs (T1). However, there were no significant ( $p < 0.05$ ) effects of ensiled corn cobs and cassava peel on the Neutrophils, Lymphocyte, Monocyte and Eosinophils of the goats. The use of cassava peel as energy supplement was beneficial in terms of the availability and economy of production. Nigeria is one of the world's largest producers of cassava and therefore, its sustainability for livestock management is guaranteed. There were no variations in Haematological parameters measured across the treatments. The values obtained for all the parameters measured fell within normal physiological range reported for healthy goats (Daramola *et al.*, 2005). PCV (27.00%) obtained in T3 of this study was higher than the values (22-24%) reported by (Fasae *et al.*, 2012) which implies that the animals were not anaemic. The haemoglobin Hb values obtained in T3 also fell within the normal values recorded for healthy goats ( Benjamin, 1981 and Fajemisin *et al.*, 2008) an indication that the diets seemed to be capable of supporting high oxygen capacity in the animal. The range obtained for Red blood cell (2.45 – 4.36  $10^6/ml$ ) was higher than 2.39-3.50( $10^6/ml$ ) reported by Amuda, (2012) and lower than (13.29 – 14.58( $10^6/ml$ )) reported by Falola, (2014). The values for White blood cell (4.33 – 7.38( $10^3/ml$ )), Neutrophils (25.00 – 31.50%), Eosinophils (2.00 – 2.50%) and Lymphocytes (64.50 – 71.00%) obtained were all within the normal range (Daramola *et al.*, 2005) for clinically healthy goats. The function of White blood cell is their response to antigen or foreign substance by forming antibodies that circulates in the blood ( Frandson, 1986). Elevated WBC above the normal range attributed to bacterial infection. The result obtained in this study indicated that the WAD goats seem to possess protection system, providing a rapid and potent defence against any infection.

### Conclusion

Based on the haematological indices obtained in this study, goats can be fed with mixture of ensiled

corncoobs and cassava peels at 50% each without any detrimental effects.

#### References

- Amuda, A. J. (2012).** Nutritional evaluation of ensiled maize stover for West African Dwarf sheep. Ph.D thesis, University of Ibadan. Pp: 196
- A.O.A.C. (1995):** Association of Official Analytical Chemist; official methods of analysis 16<sup>th</sup> edition.
- Baah J (1994) :** Selection and evaluation of feedstuffs for urban and peri-urban small ruminant production systems in Ghana. A system approach. Dissertation .university of British Columbia, Vancouver, BC, Canada. *International Journal of Agric. Science* Vol. 3(5): 380-386, May 2013.
- Benjamin, M.M. (1981).** Outline of veterinary clinical pathology (3<sup>rd</sup> Edition). The Iowa state university press, Ames, Iowa, U.S.A. pp 5–162.
- Daramola, J.O., Adeloye A.A., Fatola, T.A. And Soladoye A. O (2005).** Heamatological And Biochemical Parameters Of West African Dwarf Goats. *Livestock Research For Rural Development*
- Fajemisin, A.M., Fadiyimu, A.A. and Moka, J.A. (2008).** Performance and nitrogen retention in West African dwarf goats fed sun-dried *Musa sapientum* peels and *Gliricidia sepium*. *Journal of Applied Tropical Agriculture*. 15(special issue): 88–91.
- Falola, O. O. (2014).** Potential of vetiver grass as forage for west African dwarf goats. Ph. D thesis University of Ibadan. Pp 132.
- Fasae, O.A., Idowu, O.M.O., Moronkola, A.I. and Ijaluola, O.A. (2012).** Availability of cassava residues and by-products for goat production in cassava based farming system. *Nig. J. Anim. Prod.* 39(1): 161-168
- Frandsen, R.A. (1986).** Blood and other fluids. In: *Anatomy and Physiology of Farm Animals*. Lea and Febige. Philadelphia, 4<sup>th</sup> ed. Pp 233-254.
- Olorode, B.R., Onifade, A.A., Okpara, A.O. and Babatunde, G.M. (1995).** Growth, nutrient retention, haematology and serum chemistry of broiler chicken fed shea butter cake or palm kernel cake in the humid tropics. *J. Appl. Anim. Res.* 10:173-180
- Ravindran, V. (1993).** Cassava leaves as animal feeds; Potential and Limitations. *Journal of the science of food and agricultural* 61; 141–150.
- SAS (2002).** User guide of statistical analysis institute inc Cary, NC.

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- Amuda, A. J. (2012).** Nutritional evaluation of ensiled maize stover for West African Dwarf sheep. Ph.Dthesis , University of Ibadan. Pp: 196
- A.O.A.C. (1995):** Association of Official Analytical Chemist; official methods of analysis 16<sup>th</sup> edition.
- Baah J (1994) :** Selection and evaluation of feedstuffs for urban and peri-urban small ruminant production systems in Ghana. A system approach. Dissertation .university of British Columbia, Vancouver, BC , Canada. *International Journal of Agric. Science* Vol. 3(5): 380-386, May 2013.
- Benjamin, M.M. (1981).** Outline of veterinary clinical pathology (3<sup>rd</sup> Edition). The Iowa state university press, Ames, Iowa, U.S.A. pp 5 – 162.
- Daramola, J.O., Adeloye A.A., Fatola, T.A. And Soladoye A. O (2005).** Heamatological And Biochemical Parameters Of West African Dwarf Goats. *Livestock Research For Rural Development*
- Fajemisin, A.M., Fadiyimu, A.A. and Moka, J.A. (2008).** Performance and nitrogen retention in West African dwarf goats fed sun-dried *Musa sapientum* peels and *Gliricidia sepium*. *Journal of Applied Tropical Agriculture*. 15(special issue): 88–91.
- Falola, O. O. (2014).** Potential of vetiver grass as forage for west African dwarf goats. Ph. D thesis University of Ibadan. Pp 132.
- Fasae, O.A., Idowu, O.M.O., Moronkola, A.I. and Ijaluola, O.A. (2012).** Availability of cassava residues and by-products for goat production in cassava based farming system. *Nig. J. Anim. Prod.* 39(1): 161-168
- Frandsen, R.A. (1986).** Blood and other fluids. In: *Anatomy and Physiology of Farm Animals*. Lea and Febige. Philadelphia, 4<sup>th</sup> ed. Pp 233-254.
- Olorode, B.R., Onifade, A.A., Okpara, A.O. and Babatunde, G.M. (1995).** Growth, nutrient retention, haematology and serum chemistry of broiler chicken fed shea butter cake or palm kernel cake in the humid tropics. *J. Appl. Anim. Res.* 10:173-180
- Ravindran, V. (1993).** Cassava leaves as animal feeds; Potential and Limitations. *Journal of the science of food and agricultural* 61; 141–150.
- SAS (2002).** User guide of statistical analysis institute inc Cary .NC.