EFFECT OF VARYING LEVELS OF SAWDUST ON SELECTED MACRO MINERALS OF WEST AFRICAN DWARF BUCKS FED Panicum *maximum* AS BASAL DIET

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ABSTRACT

Eighteen (18) West Africa Dwarf (WAD) growing buck of six months of age, having weight ranges from (6.5kg-7.5kg) were used in experiment to determine the effect of feeding varying dietary levels of mixed sawdust as a replacement for wheat offal on macro mineral in blood of grower buck. The bucks were randomly allocated to three dietary treatments. The treatments were replicated thrice with two growing bucks per replicate. Three dietary treatments were formulated containing 0%, 25% and 50% of mixed sawdust respectively. Feed and water were served ad-libtum throughout the period of the experiment. The experiment lasted for eight weeks. Data obtained were arranged in a completely randomized design (CRD). The result revealed significant difference (P>0.05) in the values obtained for calcium, phosphorus and magnesium across the treatments. The highest value of calcium was recorded in T2 (6.05) while the lowest value of calcium was observed in T1 (5.18), The lowest value of phosphorus was recorded in T2 (9.00) while highest value was recorded for T1 (10.22). Highest value of magnesium was recorded in T2 (2.13) while lowest value was recorded in T1 (1.98). It could be concluded that 50% replacement level of mixed saw dust could effectively substitute for wheat offal without adverse effect on the health status of growing buck.

Keywords: Macro minerals, Buck goats, Mixed sawdust, Wheat offal, *Panicum maximum*

INTRODUCTION

Since the last century, and especially after the Second World War, there has been a dramatic increase in global production of wastes, indicative of the industrial and scientific revolutions that preceded the war and the unprecedented global levels of economic activities resulting from these revolutions, especially in developed nations (Adetunji, *et al*, 2006). Large quantities of human, agricultural, forestry and industrial wastes that are not being effectively utilized are produced annually in the tropics, thereby constituting environmental and health hazards (Agboola, 1993). In developing countries, it is becoming increasingly difficult to raise ruminant livestock on conventional feed ingredients such as maize, soybean meal, groundnut cake etc. This is as a result of their increased consumption by human beings due to increasing population thereby making it very expensive to incorporate them into ruminant rations (FAO, 1997). Aletor (1986) stated that the most important factors affecting the availability of feed are high cost arising largely from fluctuations in feed supplies, rising prices of feed ingredients, poor quality feeds and inefficiency in production and distribution in the feed industry. The feeding of these animals therefore depends on finding cheaper alternatives or unconventional feedstuffs with little or no competition from human beings (Douthwaite, 2002). Since sawdust is readily available and it can be gotten from neighboring sawmill, this can serve as a source of free ingredient in livestock diet compared to any other livestock nutrition. This experiment aimed at determining the selected macro-Mineral of West African dwarf (WAD) growing buck goats fed varying levels of sawdust as partial replacement for wheat offal using *Pannicum maximum* as basal diet.

MATERIALS AND METHODS

The experiment was carried out at the Teaching and Research Farm of, Oyo State College of Agriculture and Technology, Igboora, Nigeria. The experimental area lies in savannah forest zone on latitude 7.43°N,,longitude 3.2^0E and maximum average humidity in the study area is 58°/$_0$ .The average minimum temperature is above

21.1^{0}C and maximum average temperature is 32.5^{0}C . The double maximum rainfall is about 214.3mm in June and 165.2mm in September (Sanusi, 2011). Eighteen West African dwarf grower bucks were quarantine for two weeks and used for the study. The goats were randomly allotted to treatment diets comprising of 0%, 25% and 50% saw dust. Each treatment was replicated thrice with two animals per replicate in a completely randomized design. At the end of 8weeks, selected serum macro minerals parameters were carried out by collecting 5ml of blood samples via jugular vein from one animals per replicate, and poured into plain bottles separately. The blood sample were processed and analysed for selected macro minerals parameters such as calcium, phosphorous and magnesium. Data collected were subjected to Analysis of variance using general linear model. Treatment mean were compared with Ducan Multiple Range Test.

Table 1: Gross composition of experimental diet

Ingredients	T1 (0%SD)	T2 (25% SD)	T3 (50% SD)
Corn Bran	60.00	60.00	60.00
PKC	20.00	20.00	20.00
Saw dust	0.00	4.00	8.00
Wheat Offal	16.00	12.00	8.00
Bone Meal	3.25	3.25	3.25
Salt	0.50	0.50	0.50
Grower Premix	0.25	0.25	0.25
Total	100.00	100.00	100.00
C.P (%)	13.46	13.20	12.94
M.E (Kcal/Kg)	2681.45	2734.03	2786.61

RESULTS AND DISCUSSION

Table 2 shows the selected serum macro mineral concentrations of West African Dwarf bucks fed varied proportions of saw dust in concentrate diet with *Panicum maximum*. In the current study, the Ca concentration for T_1, T_2, and T_3 were 5.18mg/dl, 6.05mg/dl and 5.83mg/dl respectively. There were significant ($P<0.05$) difference in the values of Ca concentrations across dietary treatments. The value of Ca obtained in this study were below the values reported by Underwood and Suttle, (1999), healthy sheep can contain from 9 to 12mg/dl of Ca in serum. The value of Ca obtained in this study also contradict with the report of Kaneko (1989) who reported that normal level of serum Ca in healthy lamb ranged from 11.0 to 12.4 mg/dl. The concentration of Ca in all treatment groups were slightly below moderate hyper-calcium level from 12 to 15mg/dl reported by Little dike *et al*. (1976) which causes Calcifications of soft tissues and depress feed intake. The variation in serum Ca concentrations between animals might be associated with endocrine secretions (Underwood and Suttle, 1999). The plasma Ca concentration was greater in the goats fed 25% of saw dust and followed by goats maintained on 50% of saw dust in concentrate diet. The Phosphorus (P) concentration in serum of goats were significantly ($P<0.05$) varied across the treatment groups. The obtained values (9.00 – 10.22mg/dl) in this study were above the normal range of Phosphorous (P) in serum of sheep which ranges from 4 to 8mg/dl reported by Latimer *et al*. (2003). The Mg concentration recorded in T_2 (2.13mg/dl) was higher than other treatments and significantly ($P<0.05$) different across treatment groups. Analysis of Mg minerals in the serum samples from all treatment groups indicated adequate amount of Mg in the serum of the goats. This could be due to higher Mg concentration in the diets. The values of Mg in this current finding were comparable with the critical level which ranged from 1.0 to 2.0mg/dl for sheep reported by McDowell (2003), normal range from 2.0 to 2.7mg/dl reported by Latimer *et al*. (2003) and from 1.0 to 3.0mg/dl reported by (Pulse,1994). However, concentration of Mg in current study is below toxic level (>6ppm), which causes diarrhea in sheep (NRC, 2007). Deficiencies in Mg can cause many problems for livestock, especially those with high nutritional demands such as rapidly growing weaners and

pregnant or lactating ewes (Mayberry *et al.*, 2010). The lower concentrations of Mg recorded for animals fed diet T_1 might be due to the higher potassium concentration in the diet which might affect the absorption of Mg. Magnesium is usually absorbed from the rumen and any excess is excreted via the kidneys (Underwood and Suttle, 1999).

Table 2: The effect of mixed sawdust on macro mineral

	T1	T2	T3	SEM
Calcium(mg/dl)	5.18^{c}	6.05^{a}	5.83^{ab}	0.21
Phosphorus(mg/dl)	10.22^{a}	9.00^{c}	9.64^{b}	0.28
Magnesium(mg/dl)	1.98^{c}	2.13^{a}	2.05^{b}	0.04

^{abc} Means on the same row with different superscript differ ($p<0.05$) significantly

CONCLUSION AND RECOMMENDATION

It is therefore concluded that 50% sawdust supplementation in goat diet does not have deleterious effects on macro mineral elements in blood of goat. However, more research should be carried out by subjecting sawdust to different treatment for better utilization of ruminant animals.

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