

EFFECT OF GUINEA GRASS (*Panicum maximum*) PRODUCED USING COW DUNG AND NPK FERTILIZER ON GROWTH PERFORMANCE AND HAEMATOLOGY OF RED SOKOTO BUCK

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ABSTRACT

*This experiment was carried out at the Livestock Teaching and Research Farm of the Department of Animal Science, Federal University Dutsin-Ma. The feeding trial was carried out using 15 Red Sokoto bucks, allotted into three treatment of five replicates in a Completely Randomized Design (CRD). The feeding trial lasted for 84 days. Data obtained were analyzed using General Linear Model of SAS. The results indicated that final weight and weight gain were significantly ($P < 0.05$) affected by different types of *Panicum Maximum* supplementation. However, initial weight, feed intake and feed conversion ratio were not significantly ($P > 0.05$) affected. Hemoglobin and white blood cells were significantly ($P < 0.05$) affected by the dietary treatments. Combined supplementation of *Panicum maximum* produced using cow dung and inorganic fertilizer have profound effect on growth Performance, and hematological profile of Red Sokoto Bucks.*

Keywords: Guinea grass, Fertilizer, Growth, Haematology

INTRODUCTION

Crop and livestock are important to the livelihood of the Nigerian populace. Akinola (2015) reported that 50-80% of Nigerians are involved in either crop, livestock or crop-livestock agriculture. According to Kamuanga (2008), livestock rearing plays a key role in the economies of West African countries providing, 5% of GDP of Nigeria, while agriculture as a whole contribute about 35% to the national gross domestic product of the Nigerian economy. Animals are reared for manure, meat, milk and ceremonial proposes (Taoray, 2014).

Red Sokoto is a meat and milk breed found in the northern part of Nigeria, and mostly the breed is red in coat colour with short tail, relatively small in size (60cm buck 54-55cm dose in size), the Males are 28-30kg, Female 23-25kg body weight, and the breed is highly prolific in nature.

Panicum maximum is one of the most important native forage grass cherished by livestock in Nigeria. Ruminant animals rely on pasture plants for their nutrition than any other feed resources (Abdulaziz and Aderinola, 2007). *Panicum maximum* is propagated by seed and tiller and considered to be the most valuable fodder plant in the area where it is found naturally, it has high seed and leaf production, very palatable to livestock. It is widely cultivated as pasture and used for making good quality hay (Gibbs, 2011). In order to grow *Panicum Maximum*, the soil needs to have adequate amounts of nutrients and moisture to foster plant growth and health. To keep land productive, nutrients must be replaced; these nutrients are typically replaced artificially or naturally by using commercial fertilizer. Cow dung is a very good source of organic matter which plays a vital role in improving the physical, chemical and biological properties of the soil, by enhancing the activities of soil micro-organisms, (Sharma and Mitta, 1991).

Inorganic fertilizers are formulated and recommended by agricultural scientists to enhance the output of the crops. All the major plant nutrients like Nitrogen, Phosphorus and Potash are mixed in different ratios to make it suitable for crops and grasses.

Pasture is a major agricultural resource supporting both the extensive and intensive systems of ruminant livestock production (Aderinola *et al.*, 2007). It is generally recognized that the nutritive value of pasture falls at maturity due to the rise in fibre content. *Panicum maximum* widely cultivated and used for making good quality hay. It grows rapidly and occurs in abundance when grown in a well-drained fertile soil (Botha and Botha, 1996). Write the objective of your study here.

MATERIALS AND METHODS

Experimental Site

The experiment was conducted at Prof. Lawal Abdu Saulawa Livestock Teaching and Research Farm of the Animal Sciences Department Federal University Dutsin-ma, Katsina State. The Departmental Livestock Teaching and Research Farm, Department of Animal science, according to field survey (2018)

A total of fifteen (15) red Sokoto bucks were randomly allotted into three dietary supplement of *Panicum maximum* comprising T1 with *Panicum maximum* produced using cow dung, T2 with *Panicum maximum* produced using inorganic fertilizer and T3 with Cow dung + inorganic fertilizer *Panicum maximum*. The experiment laid in a completely randomized design (CRD) with three replicates. Animals were given

prophylactic treatment against possible bacteria and parasite infestation prior to the commencement of the experiment

Data Collection

Data on initial live weight of the bucks were taken by weighing the goat before introducing them to the experimental diets. Subsequently, weekly live weight and feed intake were recorded while average daily weight gain (ADG) and average daily feed intake (ADFI) were determined by dividing their total against the number of days that the feeding trails. At the end of the experiment, the total feed intake (TFI) and the total weight gain was calculated and the feed conversion ratio (FCR) was determined by dividing the total feed intake by the weight gain.

At end of the experiment, one animal was randomly selected for hematological analysis. About 5mls of blood was collected from the jugular vein of each animal. The blood was placed into sterilized glass tubes/bottles containing Ethylene Diaminetetra-acetic Acid (EDTA) for Haematological studies. Red blood cell (RBC) count was determined using the improved Neubauer ruler chamber (WHO 1980), hemoglobin estimation (Hb) by the Sahli method (WHO,1980), white blood cell (WBC) counts as described by Bell *et-al.*, (1972) packed cell volume (PCV) was determined by the micro hematocrit method (WHO 1980).

Data Analysis

Data collected were analyzed using the General Linear Model of SAS package. Statistical significance was set at $P < 0.05$.

RESULTS AND DISCUSSION

The results of *Panicum maximum* supplement produced using cow dung and inorganic fertilizer on growth performance of red Sokoto bucks are presented in Table 1.. Final weight was significantly ($P < 0.05$) affected by the dietary treatment with the animal feed T3 (*Panicum maximum* grown with organic manure and inorganic fertilizer) having the highest weight of (29.533), followed by T2 while lowest final weight was obtained in T1 (23kg). Similar trends were observed in weight gain. Similarly, for the initial body weight, feed intake and total weight gain had no significant differences ($P > 0.05$).

Table 1: Effect of *Panicum maximum* produced using cow dung and inorganic fertilizer on red sokoto buck growth performance

Parameters	T1	T2	T3	SEM	LOS
Initial weight (kg)	22.100 ^a	21.367 ^a	23.670 ^a	1.2756	NS
Final weight (kg)	23.00 ^b	25.017 ^{ab}	29.533 ^a	1.333	*
Total Weight gain (kg)	7.933 ^a	5.600 ^b	6.4667 ^a	0.417	*
Feed intake (kg)	3.350	4.933	5.4667	0.378	NS
FCR	0.3767	0.5867	0.4267	0.1101	NS

^{a, b} means within rows bearing different superscripts differs significantly at $p < 0.05$ were T1= *panicum maximum* produced using cow dung produced, T2= *Panicum maximum* produced using Inorganic fertilizer, T3 = Combined, SEM – Standard error of means.

The results of the effect of *Panicum maximum* produced using cow dung and inorganic fertilizer on hematological profiles of red sokoto bucks is shown in Table 2.

Blood profile analysis is aimed at assessing the roles of dietary nutrient and welfare on the physiological and health status of the animal and also provides insights into primary physiological function of some vital organs such as liver, kidney (Garba *et al.*, 2021). The result clearly indicates that there were no significances ($P > 0.05$) differences in red blood cells despite considerable numerical differences among the treatment groups. From the haemoglobin concentration their significances ($P > 0.05$) differences in the haemoglobin concentration there are significances higher value (9.200g/dl). The significantly ($P > 0.05$) higher haemoglobin obtained in T3 (combination of *panicum maximum* produces both cow dung and in organic fertilizer, may be attributed to the nutrient content of *Panicum maximum*. Moreover, there are significance ($p < 0.05$) differences in white blood cell T1 had the highest value (19.20) followed by T2 (17.20) and lowest WBC value were obtained in T3 (16.20x10⁶/ul). The result further suggests that there were no significances changes of lymphocytes, haematocrits and granulocyte across the treated group. The haemoglobin value obtained in this study are slightly higher than the haemoglobin value of 4.00-8.57g/al reported by Fajemisin *et al.* (2021).

All other haematological value obtained in this study fall within the normal range of apparently healthy red Sokoto bucks reported by Tambuwal (2020) and Garba (2022). The normal ranges obtained in haematological value in this study indicates that animal are healthy and kept under good management practices this will be supported by Addass (2012) who reported management practices and healthy status had effect on overall haematological profiles.

Table 2: Effect of *panicum maximum* produced using cow dung and inorganic fertilizer on haematological profile of red sokoto bucks

Parameters	Treatments				
	T1	T2	T3	SEM	LOS
RBC (x 10 ¹² /L)	0.745 ^a	0.980 ^a	1.020	0.429	NS
Hb (g/dl)	8.260 ^b	8.100 ^b	9.200	1.926	*
WBC (x 10 ⁶ /ul)	19.20 ^a	17.20 ^b	16.020	5.612	*
Lymphocytes (%)	8.520 ^a	11.925 ^a	11.162	5.216	NS
HCT (%)	3.200 ^a	3.100 ^a	4.500	1.926	NS
Granulocyte (%)	4.270 ^a	4.310 ^a	11.162	5.216	NS

^{a, b} means within rows bearing different superscripts differs significantly at $p < 0.05$ were T1= *panicum maximum* produced using cow dung produced, T2= *Panicum maximum* produced using Inorganic fertilizer, T3 = Combined, SEM – Standard error of means, RBC= Red blood cell, Hb= Haemoglobin, WBC= White blood cell, HCT= Haematocrits .

CONCLUSION

Combined supplement of *Panicum maximum* produced using cow dung and inorganic fertilizer significantly affect growth performance, and some hematological profiles of red sokoto bucks.

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