

**NSAP****47th Annual
Conference
(JOS 2022)****CONFERENCE
PROCEEDINGS**THEME
**SECURING ANIMAL
AGRICULTURE AMIDST
GLOBAL CHALLENGES**

RED SOKOTO GOATS PERFORMED WELL WITHOUT COMPROMISED HEALTH WHEN FED WITH TWO CULTIVARS OF COWPEA HAULM

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ABSTRACT

A study was carried out to investigate the effect of feeding two cowpea haulm varieties on serum metabolites in Red Sokoto bucks. The experiment consisted of 15 Red Sokoto bucks of average weight of 10kg, which were balanced for weight and randomly assigned to 3 dietary treatments with 5 bucks per treatment in a Complete Randomize Design (CRD). The 3 treatment diets consisted of *Brachairia decumbens* hay as basal diet and concentrate diets which were supplemented with cowpea haulms at 0% (Control), 10% (SAMPEA 14) and 10% (SAMPEA 15). The bucks were individually pen-fed with the experimental diets at 3% body weight for a period of 90 days before collection of serum parameters. Results indicated that, serum metabolites were not significantly different ($P>0.05$) both across the treatments. Bucks fed 10% SAMPEA 15 diet, had numerically the higher serum glucose level and blood urea nitrogen (8.47 vs 1.94 Mmol/L) followed by the bucks fed the diet containing 10% SAMPEA 14 inclusion (5.88 vs 1.83 Mmol/L) and the control group (5.27 and 1.60 Mmol/L) respectively. However, bucks fed 10% SAMPEA 14 inclusion level had numerically higher total protein (4.41 g/100ml) compared to other groups. It was concluded that, farmers should include 10% SAMPEA haulm in concentrate diet of Red Sokoto bucks to supplement low quality feed resources for better performance without compromising the health of the goats.

Keywords: Bucks, Cowpea, Rumen, Serum and Varieties.

INTRODUCTION

Goat nutrition is about the actual understanding of what and how much to feed your goat for maintenance, work and production motives with physiological state, age performance level and class of the animal. Feed is crucial to the existence of the animals. Apart from disease and parasitism, the rate of growth, development and the level of reproductive efficiency are all influenced by the plane nutrition. Beside nutrition, the health condition of an animal is a function of the serum constituents as these determines its ability to transport oxygen and nutrients to tissues and to defend itself against infections (Okunlola *et al.*, 2015). Previous studies have shown that changes in biochemical indices are pointers to various disease conditions, even at sub-clinical levels and have been used to provide diagnostic and prognostic aids in some disease conditions (Taiwo and Anosa, 1995). Therefore, the effects of diets such as cowpea haulms on serum chemistry should be of paramount interest. This study was carried out to investigate the effect of feeding two cowpea haulm varieties on serum metabolites in Red Sokoto bucks.

MATERIALS AND METHODS

Experimental site

The serum metabolites studies was done at the end of a feeding trial conducted at the Sheep and Goat Unit of College of Agriculture and Animal Science, Division of Agricultural colleges, Ahmadu Bello University, Mando-Road, Kaduna State. The farm is located at an elevation of 676m and latitude of 10°35'N and longitude of 7°25' E (GPS, 2018).



Sources of experimental materials

Cowpea haulms (SAMPEA 14 and 15 varieties), *Brachiaria decumbens* hay (signal grass) and Red Sokoto bucks were obtained from Pasture Unit and Sheep and Goat Unit of College of Agriculture and Animal Science, Ahmadu Bello University, Mando-Kaduna State, Nigeria.

Experimental design and animal's management

Fifteen (15) experimental Red Sokoto bucks of an average weight of 10kg were used for the experiment. The animals were balanced for initial weights before they were allocated to three (3) treatment diets with five (5) bucks per treatment in a Complete Randomize Design (CRD). The bucks were de-wormed with *Albendazole* by oral administration against internal parasites, *Rhodiacides* solution was sprayed on the animals using knapsack sprayer against external parasites. The animals were allowed 90 days feeding trial before collection of rumen and serum parameters.

Experimental feeds and treatments

The three treatment diets consisted of *Brachiaria decumbens* hay as basal diet. Concentrate diets (14% CP) was supplemented with cowpea haulms at 0% (Control), 10% (SAMPEA 14) and 10% (SAMPEA 15). The supplemented concentrate consisted of other ingredients such as maize offal, cottonseed cake, bone meal and salt. The Basal forage diet was fed *ad libitum* after feeding the supplements in order to ensure maximum supplement consumption at the rate of 1% of body weight per head per day in the morning (08:00 am). Water and mineral salt lick were provided *ad libitum* for the period of 90 days.

Table 1: Ingredient composition of concentrates containing cowpea haulms supplements.

Parameter	CONTROL (0%)	SAMPEA 14 (10%)	SAMPEA 15 (10%)
Cowpea haulm	0.00	10.00	10.00
Maize offal	35.46	27.33	31.08
Rice offal	30.00	30.00	30.00
Cottonseed cake	32.54	30.67	26.92
Bone meal	1.50	1.50	1.50
Common salt	0.50	0.50	0.50
Total	100.00	100.00	100.00
Cost/ kg feed (₦)	72.29	61.76	58.22
Calculated analysis:			
Crude protein (%)	14.46	14.19	14.41
M.E (Kcal/kg)	3090	3059	3051

ME = Metabolizable energy, ₦= Naira

Measurement of serum metabolites

Ten milliliters (10ml) of blood samples were collected from the jugular vein of three bucks per treatment at the end of the feeding trial using disposable syringe into plastic container before feeding at about 8:00am. Blood samples were centrifuged immediately and plasma was decanted and separated from the serum. The serum samples were stored in a deep freezer (1-20°C) until required for analysis of total protein, blood urea nitrogen and glucose concentration.

Laboratory analysis

Serum samples were determined by Enzymatic and Photometric Colorimetric Tests according to the procedure described by Sakha *et al.* (2009) at laboratory of the Department of Human Anatomy, Ahmadu Bello University, Zaria. Metabolizable Energy (ME) of the diet was estimated using the equation of Alderman (1985):

$$ME (MJ/kg DM) = 11.78 + 0.00654CP + (0.000665EE)^2 - CF (0.00414EE) - 0.0118A$$

Statistical analysis

Data collected on were analysed using Analysis of Variance (ANOVA) by General Linear Model procedures (SAS, 2003). Treatment means were separated using Dunnet's Test.



RESULTS

Table 2 showed the effect of feeding two cowpea haulm varieties on serum metabolites in Red Sokoto bucks fed *Brachiaria decumbens* as basal diet. There was no significant difference ($P>0.05$) in the serum metabolites across all the treatment groups before feeding. Bucks fed 10% SAMPEA 15 diet, had numerically the higher serum glucose level and blood urea nitrogen (8.47 vs 1.94 Mmol/L) followed by the bucks fed the diet containing 10% SAMPEA 14 inclusion (5.88 vs 1.83 Mmol/L) and the control group (5.27 and 1.60 Mmol/L) respectively. However, bucks fed 10% SAMPEA 14 inclusion level had numerically higher total protein (4.41 g/100ml) compared to other groups.

Table 2: The effect of feeding two cowpea haulm varieties on serum metabolites in Red Sokoto bucks fed *Brachiaria decumbens* as basal diet.

Parameters	CONTROL 0 (%)	SAMPEA 14 10 %	SAMPEA 15 10 %	SEM	LOS	Reference values
Glucose (Mmol/L)	5.27	5.88	6.47	1.60	NS	3.57-7.14
Blood Urea Nitrogen (Mmol/L)	1.60	1.83	1.94	0.75	NS	0.8 - 9.7
Total Protein (g/100ml)	3.99	4.41	3.80	0.68	NS	2.9 - 5.9

SEM = Standard Error of Mean, LOS = Level of Significance, TVFA = Total volatile fatty acids NH₃-N= Ammonia nitrogen.

DISCUSSION

In the present study, blood glucose and blood urea nitrogen values fall below the normal physiological range of 3.57-7.14 mmol/L (Safari *et al.*, 2011) and 0.8-9.7 mmol/L (Daramola *et al.*, 2005) for goats respectively. The low values across the treatments indicated that the cowpea haulm had no negative effect on the health status of Red Sokoto bucks. Total protein reflects availability of protein and its concentration declines in the face of protein deficiency. The normal values for total protein in Red Sokoto goat has been reported to be 2.9-5.9 g/100ml (Daramola *et al.*, 2005). The high level of total protein noticed in this study indicates that the diet fed to the bucks had adequate amount of crude protein in it. Oyedipe *et al.* (1984) indicated that high protein intake in a diet results to high blood protein. This indicates that cowpea forage (SAMPEA haulms) can be included at 10% in the diets of Red Sokoto bucks to supplement low quality feed resources without affecting the liver function.

CONCLUSION

Results obtained from this study shows that farmers should include 10% SAMPEA haulm in concentrate diet of Red Sokoto bucks to supplement low quality feed resources for better performance without compromising the health of the goats.

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