RUN 06

Performance, Neck and Cephalic Measurements of Grazing Bunaji Bulls Supplemented Varying Levels of a Crop Residues and Agro Industrial by Products Based Diet

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Abstract
This study was carried out to assess the effect of feeding varying levels of a crop residue and agro industrial by product based diet on the growth performance, neck and cephalic measurements of Bunaji bulls during the dry season. The crop residues and agro industrial by products included in the diet were: soy bean haulms, rice straw and maize husklage; and brewers dried grain, cassava peels, palm kernel cake and maize offal respectively. A total 16 Bunaji bulls weighing averagely 154.5 Kg were allotted four per treatment with each bull serving as a replicate and fed 1.0, 1.5, 2.0 and 2.5 kg of the diet which corresponded to T1, T2, T3 and T4 for a period of 90 days. Indices measured were body weight gain, water intake, final body weight, neck length, neck circumference, ear length, muzzle circumference, face length and head width. Results obtained showed significant differences ($P<0.05$) in all parameters measured, except ear length and head width. It was concluded that feeding higher levels of the diet enhanced the performance of the Bunaji bulls and were recommended to feeding to grazing Bunaji bulls during the dry season.

Keywords: Crop residues, agro by-products, feed, Bunaji bulls

Introduction

Cattle play a significant role in providing beef and other products for feeding Nigeria's teeming population. One of the challenges hindering productivity of ruminant animals in Nigeria and elsewhere is the non availability of quality pasture to sustain feeding of the animals on a year round basis (Onwualu, 2011), hence the need continuous research on various alternatives for feeding them to ensure they contribute their products for welfare of Nigerians. To ensure survival and production of the animals during dry season, feed supplementation becomes a necessary practice. Crop residues and agro industrial by products have been identified as readily available feed inputs that can be relied on for feeding the ruminants when pastures dry up in the dry season and the animals suffer nutritional stress (Drake *et al*., 2002; Sarklong *et al.,* 2010). Many authors have reported on the performance of ruminants when they were fed supplementary diets made of either crop residues or agro industrial by products or combinations of both (Ahamefule *et al*., 2007; Fajemisin *et al*., 2012).

The aim of this study was to evaluate the growth performance, neck and cephalic measurements of grazing Bunaji bulls supplemented varying levels of a crop residues and agro industrial by products based diet.

Materials and Methods

The study was carried out at the Livestock Teaching and Research Farm of the University of Agriculture, Makurdi, Benue State, in the North Central part of Nigeria. Makurdi has a maximum temperature of 35°C and a minimum temperature of 28°C. The humidity of the area is high (74%) all year round except in January, when the dry wind blows from the north and the annual rainfall is over 1000 mm (Mngutyo and Ogwuche, 2013).A total of 16 Bunaji bulls weighing 154.5 Kg on average were sourced from the Makurdi International Cattle market, brought to the experimental site, individually identified by ear tags and quarantined for a period of 30 days during which they were treated against ecto and endo parasites. Four bulls were allotted per treatment and the treatments were fed varying levels of the experimental diet thus: 1.0, 1.5, 2.0 and 2.5 Kg daily which corresponded to T1, T2, T3 and T4 respectively. The experimental diet (Table 1) was fed in the morning at 08:00 hours after which they were taken out for grazing by 10:00 hours.

Measurements on the experimental animals were taken at the commencement of the study and there after weekly. Neck and cephalic parameters on the animals were obtained by using rulers and thread as described by Hall (1999) thus:
Neck length as distance from the base of the ear attachment to beginning of the shoulder
Neck circumference as distance round the neck
Face length as distance between the eyes
Head width as distance between the horns
Ear length as from point of attachment to ear tip
Muzzle circumference as the distance around the muzzle

Collected data was analyzed using Analysis of Variance (ANOVA) in a Completely Randomized Design using MiniTab Statistical Software, while significant differences in means were separated using Duncan Multiple Range Test as outlined by Steel and Torrie, (1980).

Table 1: Experimental Diet

Feed Input	% inclusion
Brewers dried grain	19.0
Soya bean haulms	10.0
Rice straw	4.0
Maize husklage	6.0
Cassava peels	15.0
Palm kernel cake	15.0
Maize offal	30.0
Salt	1.0
Total	100
Nutrient composition	
Dry matter (%)	87.1
Crude protein (%)	16.31
Crude fibre (%)	14.81
Ether extracts (%)	3.50
Ash (%)	5.17
Nitrogen free extracts (%)	50.94
Gross energy (MCal/Kg)	3.41

Results and Discussion

The performance, neck and cephalic measurements of the experimental bulls are shown in Table 2. There was significant difference ($p<0.05$) in mean values for average daily weight gain. Highest weight gain was recorded for T4, followed by T3, then T2 and lastly T1. Mean values for daily water intake and final body weight were significantly different ($p<0.05$) from each other and showed a similar pattern of increasing from T1 to T4 as average daily weight gain. Higher neck length values were obtained for T3 and T4 and these were significantly different ($p<0.05$) from values of T1 and T2 which were similar to each other. Neck circumference also showed significant difference ($p<0.05$) with T1 being highest followed by T3, then T2 and lastly T1. Significant difference ($p<0.05$) in mean values for ear length showed T4 having the highest value followed by T3 while values for T1 and T2 were similar to each other. Face length values showed same pattern exhibited by muzzle length while mean values for head width did not show any significant difference ($p>0.05$). In general, the performance of the bulls reflected feed intake. It was reasoned that the increasing feed intake would have provided a conducive environment for the rumen micro organisms to break down the scabrous forages that form basal diet for the bulls (Otaru *et al*., 2010). The daily body weight gain values compare with works of other authors (Ayoade *et al.,* 2015; Wuanor *et al*., 2015).Water intake also responded to feed intake as the water would be very useful in metabolic activities of the bulls (Wilkinson and Stark, 1987). Pattern of neck and cephalic measurements followed that shown by feed and water intakes as well as body weight gain because changes in the individual body parts depend on body weight changes.

Table 2: Performance, neck and cephalic measurements of grazing Bunaji bulls supplemented varying levels of a crop residue and agro industrial by product diet

Parameter	T1	T2	T3	T4	SEM
Initial weight (Kg)	155	154	154	154	6.56
Daily weight gain (kg)	0.10^{c}	0.11^{c}	0.46^{b}	0.70^{a}	0.07
Daily water intake (Kg)	12.50	14.6	15.9^{b}	16.8^{a}	0.25
Final weight (Kg)	164.0^{c}	163.9^{c}	195.4^{b}	217^{a}	2.49
Neck length(Cm)	0.25^{c}	0.25^{c}	0.50^{b}	0.50^{a}	0.09
Neck circumference(Cm)	0.10^{c}	0.25^{c}	0.30^{b}	0.75^{a}	0.06
Ear length (Cm)	0.01	0.01	0.02	0.03	0.004
Muzzle circumference (Cm)	0.01^{c}	0.01^{c}	0.02^{b}	0.04^{a}	0.007
Face length (Cm)	0.01^{c}	0.01^{c}	0.02^{b}	0.04^{a}	0.007
Head width (Cm)	0.02	0.02	0.03	0.04	0.006

^{a,b,c}- means in same row with different superscripts vary significantly ($p<0.05$)

Conclusion and Recommendation

It was concluded that feeding higher levels of the diet enhanced performance of the Bunaji bulls. It was recommended that increasing levels of the diet be fed to Bunaji bulls during the dry season to enhance their performance, neck and cephalic measurements.

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