



RESEARCH ARTICLE

Effect of Agro-Industrial by- Products and Crop Residues Based Concentrate on the Performance of Balami Lambs

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ABSTRACT

An experiment was conducted to determine growth and feed intake by Balami lambs of a concentrate containing agro-industrial by-products and crop residues. Twelve recently weaned male lambs aged 82 days old with an average body weight (BW) of 16.8±2.66kg, were placed in an individual pens and the diet was offered *ad libitum*. There was a significant curvilinear relationship ($P<0.01$) determined by the equation $Y= 0.0018x^2+0.106x+16x+16.8$ ($R^2=0.999$) characterized the growth curve of the lambs (Y = live weight; x is days on trial). Overall average growth rate was 205g/day; feed conversion was 5.21. It was concluded that lambs fed diet based on completely non-conventional feed resources indicated a recommendable growth and feed conversion rate.

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INTRODUCTION

In the dry season, the main problem of ruminant production in Nigeria is nutrition, especially the quality and quantity of roughage which forced farmers to use other resources as feed. These farmers are largely ignorant of the principles of feeding although the plane of nutrition is a major factor that determines growth and development of small ruminants (Ekumankama, 1999). Also, natural pastures support only satisfactory performance of small ruminants for a relatively short time and, agro-industrial by products and crop residues are readily available. When sheep are fed with cowpea straw, maize stover or low quality roughage, supplemented with feed containing protein or other energy source such as maize bran, meat meal, rice polishing, sorghum bran, urea is required to improve both roughage utilization and growth performance (Sampong *et al.*, 2007). The objective of this experiment was to evaluate the performance of Balami lambs using agro-industrial by- products and crop residues.

MATERIALS AND METHODS

Location and climate of the study area

The study was conducted at C.O.E. Waka-Biu, Agricultural Science Education Department, Teaching and Research farm, located on latitude 10° 36'N with an

elevation of 750 m above sea level. The climate consisting of a dry season from November to March followed by a wet season from April to October, the rainfall varies with the seasons. It normally commence in May with short intense rainfall storms. It increases and peaks in August with average rainfall of 850 mm and decreases in October with an average rainfall of 430 mm. During the Wet season, the average max daily temperature is between 30 °C and 36 °C and an average maximum daily temperature between 32 °C and 30 °C during the hamattan period.

Experimental animals and management

Twelve recently weaned Balami male lambs 82days old, with an average Body weight (BW) of 16.8±2.66kg were placed in individual pens and subjected to a dietary treatment. The animals were vaccinated against hemorrhagic septicemia and pneumonia with a live tissue culture vaccine 15 days before Weaning. Deworming and Vitamins were administered at weaning with albendazole (10mg kg-1 BW) and with 1ml vitamins, respectively.

Experimental diet

A concentrate mixture was formulated using agro-industrial by- products and crop residues as the main ingredients. The concentrate and fresh clean water were provided *ad-libitum*.

Statistical analysis

Live weight (LW) of the animals was recorded at the beginning and every seven days at the same time before feeding. Daily feed intake was recorded. Trends in growth rate were analyzed through the adjustment of a regression of live weight on trial (Cochran and Cox, 1991).

RESULTS AND DISCUSSION

The composition of the concentrate formulated is shown in Table 1. Agro industrial by-products and crop residues were the main ingredients formulated as the experimental concentrate mixture, while the chemical analysis in percentages is also presented in Table 2.

A significant curvilinear relation ($P < 0.01$) explained by the equation $Y = 0.0018x^2 + 0.106x + 16.8$ ($R^2 = 0.999$), characterized lamb growth rate, indicating that growth rate increased as the trial progressed (Fig. 1). Thus the daily weight gain was 133g from weaning up to day 21, followed by a higher growth rate (249g per day) thereafter (Table 3).

Table 1: Composition of concentrate mixture

Ingredients	Percentage (%)
Mineral premix	0.40
Urea	1.00
Salt	1.00
Animal lard	1.60
Calcium carbonate	2.50
Rice polishing	3.00
Cowpea straw	5.00
Maize bran	11.50
Meat meal	8.50
Maize Stover	13.00
Sugar cane molasses	22.00
Maize grain	30.50

Table 2: Chemical analysis of concentrate mixture nutrient

Nutrient	Percentage (%)
Day matter, %	89.30
Organic matter, %	78.00
Crude protein, %	18.80
Crude fibre, %	7.20
Ether extract, %	2.50
Nitrogen-free extract, %	60.20
Ash, %	11.30
Metabolizable energy, M Cal/KgDm*	2.80

Table 3: Products performance of Balami Lambs fed a complete diet based on agro-industrial by-products and crop residues

	Initial weight (kg)	Final weight (kg)	Average weight gain (O/d)	Average DM1 (g/d)	Feed conversion (2DM/g gain)
First 21 days	16.8	19.7	133	900	6.77
Last 35 days	19.7	28.4	24.9	1170	4.70
Total(56days)	16.8	28.4	205	1069	5.21

The daily DM intake, expressed as a function of live weight was high (mean of 4.0kg/100kg LW/day) with a tendency to decrease during the trial (Fig. 2). The DM feed conversion was 5.21 on average (Table 3). Growth performance was higher than reported by Shapiro, Mohammed-Saleem and Reynolds (2007) for strategic sheep fattening under tropical conditions. They recorded a daily weight gain of 33g and 70g in sheep supplemented

with a diet containing wheat bran and cotton seed cake, straw and sesbania leanes. Also, Ikeobi and Faleti (1996) maintained Yankasa sheep semi-Intensively on pasture and supplemented with browse recorded an average of 38g/d. However, Sheep show better utilization gaining 53g/d when offered sorghum stovers and cotton seed cake (Aboud, 1994). Similarly Dutta *et al.* (2008) reported a gradual increase in daily gain up to 50g in a trial with lambs for fat supplementation. Under traditional systems without organized inputs, Indian lambs achieve 40-50g of average daily gain in most active phase of growth (Karim, 2008). Lambs need high energy and protein ration to assure high productivity and rapid growth (Manso *et al.*, 2006).

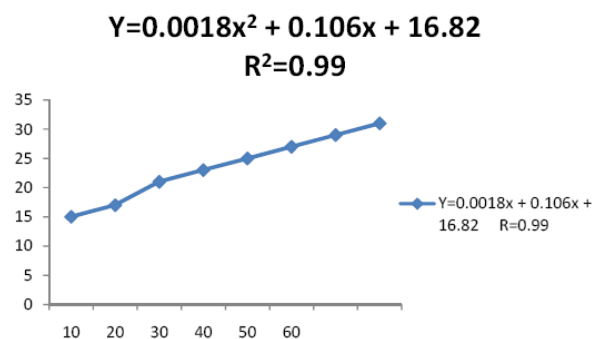


Fig 1: Growth curve of Balami Lambs fattened on a diet based on agro- industrial by- products and crop residues.

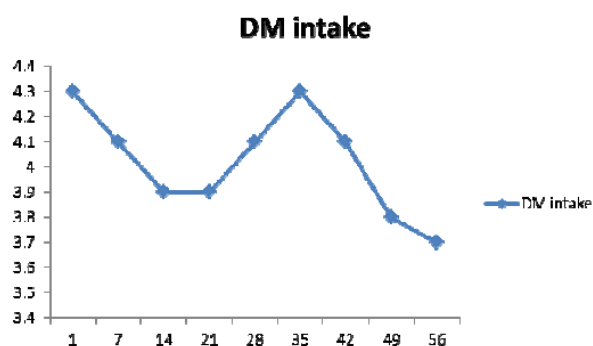


Fig 2: Evolution of DM INTAKE (Kg DM/100kgLW) in relation to the days on trial

Conclusions

Seasonal scarcity and uneven distribution of good quality forages in the study area made it imperative to intensify search for sources of dietary protein and energy for livestock feeding. Balami Lambs fed a diet based on agro-industrial by-products and crop residues as main ingredients, had an average growth of 205g/d and DM feed conversion of 5.2. These resources (Agro-industrial by-products and crop residues) could go a long way in helping small scale farmers overcome the effect of feed scarcity during the dry seasons.

REFERENCES

About AA, OE Owen, JD Read and AN Said, 1994. Influences of amount of feed offered on growth, intake and selectivity: Observation on sheep and goats. Proc of the 2nd Biennial Conf. of the African

- small Ruminant Research Network AICC, Arusha, Tanzania, 7-11, December, pp: 1992-157.
- Cochran WG and A Cox, 1991. *Disenos Experimentales 2a Edicion-mexico Trillas*, pp: 661.
- Dutta TK, MK Agnihotri and SBN Rao, 2008. Effect of supplemental palm oil on Nutrient utilization ,feeding economics and carcass Characteristics in post wweaned muzafarnagari lambs under feedlot conditions. *Small Ruminnant Research*, 78: 66-73.
- Ekumankama OO, 1999. Managing natural pasture for small ruminants. The Case of alley farming in Ikwuano Area of Abia State. *Niger J Anim Prod*, 26: 120-124.
- Ikeobi CON and OA Faleti, 1996. Factors affecting liveweight of goats and Sheep in two locations within Ogun State, *Niger J Anim Prod*, 23(1).
- Karim SA, 2008. Prospective of Small ruminant for augmenting rural Prosperity, In: Karim SA. Tripathi MK. Chaturvedi OH and Shinde AK (Eds). *Small Ruminant Production in India strategies for enhancing*. Statish serial publishing House, Delhi, India, pp: 1-17.
- Manso TC, T Mantecon and AR Jimeno, 2006. Effects of palm Oil& Calcium Soaps, palm Oil fatty acids in fattening diets on digestibility, performance and chemical composition of Lambs. *Anim Feed Sci Technol*, 127: 175-186.
- Shapiro BI, MA Mohammed-Saleem and L Reynolds, 2007. Socio-economic constraints to strategic sheep fattening: evidence from the Ethiopian highlands. *FAO Corporate Document Repository*, <http://www.Fao.org.wairdocs/1LR1/X5472B/X5472603.htm>.
- Sompong S, S Pirote and S Warunee, 2007. Agro industrial by-products as Roughage source for beef cattle: Chemical composition, Nutrient digestibility and energy values of ensiled sweet Corn cob and husk with different levels of 1pil-1pil leaves. *Maejo inter J sci Technol*, 01: 88-94.