

PERFORMANCE INDICES OF SOKOTO GUDALI CATTLE FED SAWDUST AS REPLACEMENT FOR CASSAVA PEELS

*¹M.A. MOSOBALAJE, ²O.O. TEWE, ³A.A. ADEDOYIN, ⁴S. FRANCIS, ¹A.B. OLOKO, ¹O.A. ADENIYI, AND ¹K.B. TAIWO,

¹Department of Animal Health and Production, Oyo State College of Agriculture, Igboora, ²Department of Animal Science, University of Ibadan ³Department of Agriculture, Emmanuel Alayande College of Edu. Lanlate Campus, ⁴Department of Animal Health and Production Federal college of Animal Production
*mosobahs@yahoo.com

ABSTRACT

A fifteen week feeding trial was conducted to investigate the effect of inclusion of sawdust on performance characteristics of Sokoto Gudali bull. Fresh sawdust was collected from sawmill and used to replace cassava peel at 0, 10 and 20% inclusion levels constituting diets 1, 2, and 3 respectively. Diet 1 served as the control diet. Nine adult male Gudali cattle were randomly allotted to three experimental diets. There were three cattle per treatment and each served as a replicate. The animals were offered 5kg of concentrate daily while *Panicum maximum* was given *ad libitum* using zero grazing method. The experimental design was complete randomized design. Parameters considered included final weight, weight gain, concentrate intake, grass intake, total feed intake, feed efficiency and mortality. Results obtained revealed that weight gain, concentrate intake, grass intake, total feed intake and feed efficiency were significantly ($p < 0.05$) affected by dietary treatments. Gudali cattle fed 10% sawdust recorded values (0.61, 4.50, 10.86, 15.36 kg/day/animal and 0.04, respectively) that were similar ($p > 0.05$) to those cattle fed the control diet (0.56, 4.38, 10.34, 14.72 kg/day/animal 0.04, respectively). However respective values of those fed 20% sawdust (0.42, 4.51, 11.83, 16.34 kg/day/animal and 0.03) were significant ($p < 0.05$) compared to the control diet. Final weight and mortality were not significantly affected. Inclusion of sawdust in the ration of Sokoto Gudali cattle did not adversely affect performance at 10% inclusion level.

Keywords: Cattle, Concentrate intake, Sawdust, Sokoto Gudali, Performance.

INTRODUCTION

As the demand for wood and its product increases, the volume of wastes being generated cannot but increase. Hence, one of the greatest environmental problems facing the city today is how to dispose properly, the waste being generated daily by the ever-increasing activities of the sawmill industries. (Ogunbode *et al.*, 2013). It is observed that 45-50 per cent of original wood (timber) taken for mechanical processing ended in waste (Badejo, 2001). Cottage industries such as carpentry, saw-milling, felling of timbers etc, produce enormous saw-dust waste in Nigeria. It is estimated that the volume of saw-dust waste generated by saw-mills is about 3.89 million cubic meters per year (Badejo and Giwa, 1985). This waste generation increases with industrial growth, some of these wastes are burnt in open air (Obam, 2012), and thus contribute to ozone layer depletion. Sawdust or wood dust is a by-product of cutting, grinding, drilling or pulverizing wood with saw or other tool. It is composed of fine particles of wood. Wood residues contain 70 to 80% total carbohydrate (Keith, 1976). Cattle and other ruminants have a unique digestive system that allows them to use waste and other types of by-

products as sources of dietary nutrients. The cattle-feeding industry has been built largely on the use of by-products and other materials that can be digested only by ruminants (Darrell, 2000). One by-product that can be used as cattle feed is saw dust. It is a good source of dietary fibre for cattle (Husein *et al.* 2012). Radwan (1994) reported that sawdust of different types contained 2.53% crude protein, 0.76% ether extract, 60.26% crude fibre, 24.53% nitrogen-free extracts and 0.80% crude ash. In another experiment, Oke and Oke (2007) reported 0.88% crude protein, 1.47% ether extract, 67.61% crude fibre and 0.64% crude ash in Ogea sawdust. These observations are in close agreement with Husein *et al.* (2012) who reported 94.1% dry matter, 2.4% crude protein, 56.5% crude fibre, 32% NFE, 1.4 ether extract, 1.8% total ash and 1208.2 kcal/kg, however reported large variation between different species. Sawdust is abundant throughout the whole year in Nigeria. Utilization of sawdust may reduce the cost of conventional livestock feeds since it does not compete with human being. Sawdust has been fed satisfactorily to ruminants as a roughage substitute in all concentrate rations (Sowande, 2002). Therefore, cattle farmers who have scarcity for forages,

straw and stover, may consider feeding of hard wood saw dust and wood shavings to a limited amounts. Previous studies indicate that, the inclusion of 5-15% sawdust in maize based diets for cattle was found to maintain better rumen function irrespective of few cases for bloat and liver lesions and less rumen perkaratosis (Sowande, 2002). These studies indicate that, fiber materials are not merely a source of dietary fibre, rather, in true sense, they contain effective extra nutrients essential for normal gut functioning. However, Paterson, (2003) has argued that the principal anti-nutritive factor in utilizing most wastes as ruminant livestock feeds is their high fibrous ligno-cellulose contents. This study assessed the performance of Sokoto Gudali bull fed sawdust containing diets

MATERIALS AND METHODS

Nine adult male Gudali cattle that were used for the study were sourced from Akinyele kraal, Ibadan, Oyo State, Nigeria. They were randomly allotted to three experimental diets. There were three bulls per treatment and each served as a replicate. Fresh sawdust was collected from sawmill and used to replace cassava peel at 0, 10 and 20% inclusion levels constituting diets 1, 2, and 3 respectively. Diet 1 served as the control diet. Concentrate was prepared using some other ingredients as shown in table 1. The animals were offered 5kg of concentrate daily while *Panicum maximum* was given *ad libitum* using zero grazing method. The experimental design was complete randomized design. The feeding trial was conducted at Mc-Tee farm, Apete Ibadan and lasted for 14 weeks out of which two weeks was used for acclimatization. Parameters considered included final weight, weight gain, concentrate intake, grass intake, total feed intake, feed efficiency and mortality. Data collected were subjected to descriptive analysis and differences in the means were separated by Duncan multiple range test (Duncan, 1955).

RESULTS AND DISCUSSION

The results as shown in Table 2 revealed that weight gain, concentrate intake, grass intake, total feed intake and feed efficiency were significantly ($P < 0.05$) affected by dietary treatments. Weight gain of Gudali cattle fed diet containing 10% sawdust (0.61kg/animal/day) was the highest and was higher ($P < 0.05$) than value of those fed a 20% sawdust (0.42kg/animal/day), however similar ($P > 0.05$) to control diet (0.61kg/animal/day). Previous

studies indicated that, the inclusion of 5-15% sawdust in maize based diets for cattle was found to maintain better rumen function (McCartor *et al.*, 1972 and Sowande, 2002). Higher value of cattle fed 10% might be due to hydrolysis of cellulose in the digestive tract that may have contributed to a marginal extent as a growth stimulant other than simply a source of glucose derived from breakdown of cellulose (Davis and Briggs, 1947). Enzymes and other metabolites of microbiological origin might also be responsible. In fact, a wide range of microorganisms reserve the capacity to metabolize cellulose inside the gut (Baker, 1942; Hungate, 1944) and the decomposition products derived from cellulose breakdown may act as growth stimulant. Poor performance of animal fed diet 3 might be due to high fibre content of the feed as the feeds contained another source of wood by-product (wood savings in poultry litter). Feed intake (concentrate intake, grass intake and total feed intake) was adversely affected by dietary treatments. Feed intake of cattle fed the control diet was the lowest (4.38, 10.34 and 14.34kg/animal/day, respectively) and lower ($P < 0.05$) than those fed treatment 2 (4.50, 10.86, 15.36 kg/animal/day, respectively) and treatment 3 (4.51, 11.83 and 16.34 kg/animal/day, respectively). Values of feed efficiency of animals fed control diet (0.04) and diet 2 (0.04) were similar ($P > 0.05$), however better than value of those fed treatment 3 (0.03). Also final weight were not significantly ($P > 0.05$) affected by dietary treatment, the values ranged from 193.88 to 209.95 kg/animal. Mortality record was zero for all the experimental diets.

Conclusion and recommendation

Inclusion of 10% sawdust in the ration of Sokoto Gudali cattle did not adversely affect performance; however 20% inclusion gave performance indices that were lower. There will be need to ascertain tolerance level of sawdust between 10% and 20%.

REFERENCES

- Baker, F. (1942). Microbial synthesis and autolysis in the digestive tract of herbivora. *Nature*, 149: 582.
- Badejo, S. O. (2001). Saw-dust utilization for building materials production in Nigeria. Technical report, No. 50, forestry research institute of Nigeria, Ibadan.
- Badejo, S. O. and Giwa, S. A., (1985). Volume assessment and economic importance of wood wastes utilization in Nigeria.

- Technical report, No. 50, Forestry Research Institute of Nigeria, Ibadan
- Davis, F. and Briggs, G.M. (1947). The growth-promoting action of cellulose in purified diets for chicks. *Journal of Nutrition*, 34(3): 295-300
- Darrell, R. (2000) Feeding broiler litter to beef cattle. Alabama Cooperative Extension System ANR- 557. pp 1-6
- Duncan, G.B. (1955). Duncan multiple range test. *Biometric*. 11:1-42.
- Hossain, M.E., Rahman, M.J. and Islam, K.M.F. (2012). Nutritive value of sawdust. *Online J. Anim. Feed Res.*, 2(3): 288-291
<http://www.science-line.com/index/>;
<http://www.ojafir.ir>
- Hungate, E.E. (1944). Studies on cellulose fermentation. I. The culture and physiology of an anaerobic cellulose-digesting bacterium. *Journal of Bacteriology*, 48: 499.
- McCortor, M.M., England, M.W. and Hefley, H.M. (1972). Effect of various roughages in high concentrate beef cattle diets on animal performance and carcass characteristics. *Journal of Animal Science*, 34:142.
- Obam, S. O. (2012). Properties of saw-dust, paper and starch composite ceiling board. *Am. J. Sci. Ind. Res.*, 2012, 3(5): 300-304.
<http://www.scribbr.org/AJSIR>
- Ogunbode E.B. Fabunmi F.O. Ibrahim S.M. Jimoh I.O. Idowu O.O. (2013). Management of Sawmill Wastes in Nigeria: Case Study of Minna, Niger State. *Greener Journal of Science, Engineering and Technology Research*. Vol. 3 (2), pp. 034-041.
- Oke, D.B. and Oke, M.O. (2007). Effects of feeding graded levels of sawdust obtained from Daniellia ogea tree on the performance and carcass characteristics of broiler chickens. *Research Journal of Poultry Sciences*, 1(1): 12-15.
- Paterson, R.T. (2003) Uses of Trees by Livestock, 4: Anti-Nutritive Factors, Catham UK, Natural Resources Institute.
- Radwan, S.M. (1994). Use of sawdust as a source of fiber in rabbit. *Egyptian Journal of Rabbit Science*. 4(2):23-24. Retrieved from <http://agris.fao.org/agris-search/search/display.do?f=1998/EG/EG98009.xml;EG1998001772>
- Sowande, O.S., Akinleye, B.C., Ogundipe, B.A. and Idowu, O.M.O. (2002). Nutritive potentials of sawdust from mixed wood species. Proceedings of the 27th Annual Conference of the Nigerian Society for Animal Production, pp. 99-100.

Table 1: Gross composition of experimental concentrate feed

Ingredients	T1 10% Sawdust	T2 10% Sawdust	T3 10% Sawdust
Cassava peel	58	48	38
Sawdust	-	10	20
Poultry litter	20	20	20
Brewer Dry Grain	20	20	20
Bone Meal	1	1	1
Salt	1	1	1
Total	100	100	100

Table 2: Performance characteristics of animals fed experimental diet

Parameters	T1 10% Sawdust	T2 10% Sawdust	T3 10% Sawdust	SEM
Initial weight (kg/animal)	156.00	154.33	155.67	9.14
Final weight (kg/animal)	206.69	209.95	193.88	9.65
Weight gain (kg/animal/day)	0.56 ^a	0.61 ^a	0.42 ^b	0.03
Conc. intake (kg/animal/day)	4.38 ^b	4.54 ^a	4.51 ^a	0.02
Grass intake (kg/animal/day)	10.34 ^c	10.86 ^b	11.83 ^a	0.22
Total feed intake (kg/animal/day)	14.72 ^c	15.36 ^b	16.34 ^a	0.24
Feed efficiency	0.04 ^a	0.04 ^a	0.03 ^b	0.00
Mortality	0.00	0.00	0.00	0.00

abc means with the same superscripts along a row are not significantly different (P>0.05)