ASSESSMENT OF NUTRITIONAL POTENTIAL OF SOME MIXED NON-CONVENTIONAL FEED RESOURCES IN ALIERO LGA, KEBBI STATE, NIGERIA

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ABSTRACT
Use of conventional feedstuff is unavailable, scarce and the price is high for profitable livestock production in Nigeria. Thus an experiment was conducted to evaluate the nutritional potential of millet panicle husk mixed with molasses solution and different levels of poultry dung. Millet panicle husks were measured using a weighing balance and prepared in to four different samples (A, B, C and D) each weighing 100g. A solution of molasses (70cL) was prepared with water (30cL) and mixed with the samples except with sample A (control). Thereafter, dried poultry dung was mixed to each four sample of millet panicle husk at; 0%, 20%, 30% and 40% to make a ratio; 100:00, 80:20, 70:30 and 60:40 designated as treatments; A, B, C and D. Samples were replicated three times in a completely randomized design and oven dried at 650C for 48 hours and were taken to the laboratory for proximate analysis. Treatment of millet panicle husk with molasses and varying levels of poultry dung improved ($p<0.05$) proximate composition of mixture with exception of ADF. Treatment D had higher CP, ash and NCF (19.25%, 11.00% and 43.65%) respectively and lower CF (21.54%), ADF (33.20%) and ADL (9.09%) were obtained in treatment C. Results suggested that mixture of molasses solution and poultry dung with millet panicle improved feeding value of millet panicle husk which may serves as ruminant feed during forage scarcity.
Keywords: Non-conventional feed resources, potential, mixture, proximate composition

INTRODUCTION

Among the constraints facing livestock production in developing countries particularly during the spell of dry season is the inadequate feed supply. Non-conventional plant and animal origin of farm and agro industrial wastes are potential feed materials and are being exploited for livestock production in Nigeria (Okonkwo *et al*., 2008).

Most non-conventional feed resources such as rice straw, groundnut husk, millet panicle husk etc. are usually regarded as wastes because of poor nutritional value and utilization by livestock. Cereal crops such as sorghum and millet are the most important crops cultivated in the study area. Millet panicle husk is generated after the harvesting of the grain millet. It is a by-product which is coarse, highly fibrous with low protein which rendered it poorly utilized by livestock (Heuze and Trans, 2013).

Various technologies have been investigated in Nigeria to improve the nutritive values of non-conventional feed resources (Amata, 2014). The most popular ones are chemical, physical, ensiling and mixing of several agro-industrial by-products in the form of hard feed blocks (Ben Salem and Nefzaoui, 2003). Recycling and reprocessing of wastes offers the possibility of returning these materials to beneficial use. Molasses which is a by-product of sugar is suitable as an excellent source of energy and minerals (Senthilkumar *et al*., 2016). The high nitrogen content in poultry dung suggests that feeding it to ruminants would be an excellent way to increase their protein intake (Lanyasunya *et al*., 2006). Molasses and urea are potential materials that can be useful supplementary sources (Chiejina *et al*., 2015) which can be used to improve the nutrients of millet panicle husk.

Substantial information is required on chemical composition and the presence of anti-nutritional components contained in the mixture of non-conventional feed resources. Therefore, this study was designed to evaluate the nutritive value of millet panicle husk treated with molasses and poultry dung as a potential ruminant feed resource.

MATERIALS AND METHODS

Experimental area

Experiment was conducted in the Animal Science Department Laboratory of Kebbi State University of Science and Technology Aliero. The area lies at Latitude 12^0: 16", 42^0N and Longitude 7^0, 6^0E of the Equator. The ambient temperature ranges from 26^0C to 42^0C with annual rainfall of about 500 – 850mm with a peak in August (KARDA, 2017).

Collection and processing of samples

Millet panicle husks were collected from local farmers at the processing point and screened off from foreign objects while poultry dung obtained from a poultry farm was oven dried at 60^0C, molasses was purchased from the market. All the samples were obtained in the study area.

Sample mixing procedure

Millet panicle husks were measured using a weighing balance and prepared in to four different samples (A, B, C, and D) each weighing 100g. A solution of molasses (70cL) was prepared with water (30cL) and mixed with the samples except with sample A (control). Thereafter, dried poultry dung was mixed to each four sample of millet panicle husk at; 0%, 20%, 30% and 40% to make a ratio; 100:00, 80:20, 70:30 and 60:40 designated as treatments; A, B, C and D. The samples were replicated three times in a Completely Randomized Design (CRD) and oven dried at 65^0C for 48 hours for proximate analysis. Crude protein, ether extracts (EE), Ash, Crude Fibre (CF), Acid Detergent Lignin (ADL) and Acid Detergent Fiber (ADF) were measured according to the procedure described by AOAC (2015).

Statistical analysis

Data collected were analyzed and subjected to analysis of variance using General Linear Model (GLM) of the SPSS (2015). Duncan Multiple Range Test was used to determine the significant differences among the treatment means at 5% probability level.

RESULTS AND DISCUSSION

Results of the proximate composition of millet panicle husk mixed with molasses solution and poultry dung are presented in Table 1.

Table 1: Proximate composition of millet panicle husk treated with molasses and poultry dung

Parameters (%)	ratio of millet panicle husk and poultry dung				SEM
	TA(100:00)	TB(80:20)	TC(70:30)	TD(60:40)	
DM	94.20	94.60	94.60	94.00	2.926
CP	5.75^{d}	8.58^{c}	17.50^{b}	19.25^{a}	0.020
CF	38.73^{a}	24.30^{b}	21.54^{c}	23.50^{b}	0.460
NFC	29.23	44.03	49.50	43.65	8.838
Ash	5.50^{c}	6.50^{c}	9.00^{b}	11.00^{a}	0.590
Lipid	1.00^{b}	2.00^{a}	1.00^{b}	1.00^{b}	0.245
ADF	37.10	36.70	33.20	33.70	3.221
ADL	15.69^{a}	12.69^{b}	9.09^{d}	9.69^{c}	0.116

a,b,c,d, means on the same row with different superscripts are significantly ($P<0.05$) different

ADF: Acid detergent fibre; ADL: Acid detergent lignin; CP: Crude Protein; CF: Crude Fiber; NFC: Non Fiber Carbohydrate; DM: Dry Matter

Results of millet panicle husk mixed with molasses and poultry dung are shown in Table 1.Treatment of millet panicle husk with molasses and varying levels of poultry dung improved ($p<0.05$) proximate composition of mixture with exception of Acid Detergent Fiber (ADF). The values of dry matter obtained in this study were similar with findings of Mubi *et al*. (2008) when alkali treated sorghum stover was supplemented with poultry litter. Crude protein contents of treated millet panicle husk steadily increased as poultry dung inclusion increases with treatment D having highest values (19.25%). The steady increased in CP values were in line with study of Bello and Tsado (2014) when sorghum stover was supplemented with graded levels of dried poultry droppings. Addition of molasses improved the carbohydrate of millet panicle husk. Non fiber carbohydrate increased across the treatments than the control treatment. Observation in present study is in line with the findings of

Senthilkumer *et al*. (2016). The lipid content was highest in treatment B (2.00%) than other treatments. The result obtained was in line with the reports of Muhammad *et al*. (2022) when rice milling waste was ensiled with urea and poultry litter. The range of the ash contents (6.50-11.00) of treated millet panicle husk in this study were similar to the findings of Rebecca *et al*. (2022) when cassava peels was treated with molasses. Loest *et al*. (2001) reported that the nutritive value of forage fermented with molasses were all improved. The results of ADF and ADL contents of treated millet panicle husk in this study were in line with the findings of Oderinwale *et al*. (2022) when corncobs was treated with urea at varying level.

CONCLUSION

Mixture of millet panicle husk with molasses and graded levels of poultry dung improve its overall nutrients which could serve as feed resources for feeding ruminants during feed shortage.

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