PERFORMANCE OF GROWING RABBITS FED CASSAVA PEEL MEAL ENRICHED WITH MINERAL SALT WITH OR WITHOUT LYSINE

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ABSTRACT
The cyanogenic and high fibre content of cassava peel have been identified as a major limitations to its utilization as the primary feed ingredient in livestock. Several processing methods and addition of some enzymes and minerals enhances its utilization. This study was conducted on the performance of growing rabbits fed cassava peel meal (CPM) enriched with lysine and two sources of salt. A total of sixteen rabbits were used for the feeding trial. The rabbits were randomly allocated into four dietary treatments allotted as T1 (salt+lysine), T2 (salt-lysine), T3 (trona+lysine), and T4 (trona-lysine) and four replicates with one rabbit per replicate, in a completely randomized design (CRD). The study lasted for fifty-six days. Data were collected for growth performance. Data collected was subjected to analysis of variance (ANOVA), using SPSS version 20 and differences between means was separated using LSD. Observed results showed no significant difference (P>0.05) in initial weight, daily forage intake, daily concentrate intake and total daily feed intake. However, there were significant differences (p<0.05) in final weight, gross weight gain, daily weight gain and feed conversion ratio. Final weight of rabbit showed significant difference (P<0.05) across the treatment mean with rabbit fed trona+lysine, having a higher significant value of 1286.00g than salt+lysine (1181.39g), salt-lysine (1173.11g) and trona-lysine (1194.00g) respectively. Weight gain however, had values of 839.50g for the treatment group fed trona+lysine), which was significantly higher than the rabbit fed salt+lysine (740.00g), salt-lysine treated group (720.00g) and trona-lysine treatment group (744.00g). Feed conversion ratio also show significant increase across the treatment with a value range of 8.58 to 9.74. Thus, the fortification of CPM supplemented diet with trona and lysine improve the growth performance of growing rabbits.

Keywords: Growing Rabbit, Growth Performance, Cassava Peel Meal, Mineral Salt, Lysine

INTRODUCTION

Population growth has a significant effect on food supply since it raises demand for food and competition for resources. According to Godber and Wall (2014), 12.5% of people worldwide are undernourished. Nutritionists, scientists, and agriculturists must conduct research on the use of inexpensive, readily available, and unconventional feedstuffs that could potentially replace more costly protein (groundnut cake and soybean meal) and energy sources (maize) in the future due to increased competition for available conventional feeds and food scarcity (Onyimonony and Onukwufor, 2003; Obun and Adeyemi, 2012). According to Uchewa *et al.* (2014), poor animal protein intake continues to be a significant nutritional issue among low-income and non-wage people. Raising animals with short gestational intervals (rabbits) and using unconventional feed resources, such as cassava peel meal, can help combat the increased competition for available conventional feed resources, and low animal protein intake among low-income earners and average individuals in developing countries. The production of rabbits is a sensible option for mitigating protein food shortages due to their quick rate of reproduction and short gestation period (28–32 days). It is also preferred due to its high fecundity, low investment costs, and capacity to use a variety of forages (Taiwo *et al.*, 2014; Uchewa *et al*., 2014). In Nigeria, where there is a scarcity of animal protein, rabbits have started to contribute to the meat supply in the past 20 years (Agunbiade, 2009). However, because cyanogenic glucosides, an anti-nutritional factor, impair nutritional status, the use of cassava peel in cattle feeding is severely limited (Aghanghali and Maheri, 2008). T). Hence, this study to determine the performance of growing rabbits fed cassava peel meal enriched with mineral salt with or without lysine.

MATERIALS AND METHODS

Experimental Location and Management of Experimental Animals

The study was conducted at the rabbitary unit of the teaching and research farm of Prince Audu Abubakar University, Anyigba. The study site is located on latitude 07^0 30'N and latitude 07^0 9'E and with an average altitude of 420m above sea level. The area falls within tropical wet and dry climate region of guinea savannah, with average rainfall of 1600mm and daily temperature range of about 25-35^{o}C (Ifatimehin *et al.,* 2011). A total of sixteen weaner rabbits aged 6-8 weeks old with an average initial weight of 441.39-453.11g were usedfor this study. The experimental animals were obtained from Zaaki farm in Ankpa, Kogi State. The trial adopted was a completely randomized design (CRD), to evaluate the response to four dietary treatment, where each treatment had four (4) replicates per treatment, with one rabbit per replicate. The rabbits were housed in wooden hutches measuring

63.50cmX63.50cmX63.50cm, length, breath and heights respectively and raised 25 cm from ground level. The hutches were thoroughly washed and disinfected, then allowed to dry for 7days before the animals were brought in. The rabbits were kept in individual clearly marked hutch and provided with a weighed amount of feed, forage and clean drinking water daily. A concrete watering trough and fabricated feeding trough were placed in each hutch. They were also screened against ecto and endo parasites. They were allowed to acclimatize for one week on the control diet before the commencement of the feeding trial, which lasted for 56days. Data for digestibility and nitrogen utilization were collected at the end of the feeding trial. Data collected were subjected to one-way analysis of variance (ANOVA) and means that were significantly different were separated by Least Significant Difference using SPSS window version 16.

Gross and nutrient composition of the experimental diets fed to growing rabbits

The gross composition of the experimental diet is presented in Table 1. The ingredients used include maize, Urea Treated Cassava Peel Meal (UTCPM), Soybean Meal (SBM), maize offal, bone meal, salt, trona, methionine, premix and lysine. These ingredients were incorporated into the feed according to the nutrient requirements of growing rabbits.

Table 1: Gross composition of the experimental diet

Ingredient	UTCPM (SALT+LYSINE)	UTCPM (SALT-LYSINE)	UTCPM (TRONA+LYSINE)	UTCPM (TRONA-LYSINE)
Maize	22.00	22.00	22.00	22.00
UTCPM	28.00	28.00	28.00	28.00
Soybean Meal	20.00	20.00	20.00	20.00
Maize Offal	26.00	26.00	26.00	26.00
Bone Meal	3.00	3.00	3.00	3.00
Salt	0.25	0.45	0.00	0.00
Trona	0.00	0.00	0.25	0.45
Methionine	0.39	0.40	0.40	0.40
Premix	0.25	0.25	0.25	0.25
Lysine	0.20	0.20	0.20	0.20
Total	**100.00**	**100.00**	**100.00**	**100.00**
Calculated				
Crude Protein (%)	**19.81**	**19.23**	**18.07**	**18.63**
Energy (kcal/kg)	**2946.00**	**2892.12**	**2931.98**	**3002.74**

UTCPM = Urea Treated Cassava Peel Meal

Table 2: Proximate composition of experimental diets

Ingredient	UTCPM (SALT+LYSINE)	UTCPM (SALT-LYSINE)	UTCPM (TRONA+LYSINE)	UTCPM (TRONA-LYSINE)
Dry matter	90.27	91.02	89.96	90.41
Crude protein	19.71	19.58	19.60	20.03
Crude fibre	7.21	7.94	7.06	7.95
Ether extract	4.26	4.11	4.48	4.19
Ash	5.02	5.14	5.39	5.13
Nitrogen free extract	54.07	54.25	53.43	53.11
Calculated Energy (kcal/kg)	**2946.00**	**2946.00**	**2946.00**	**2946.00**

RESULTS AND DISCUSSION

The analysed result on the performance of growing rabbits fed cassava peel meal (CPM) enriched with trona and table salt with or without lysine is presented in Table 3. Observed results shows significant difference ($p<0.05$) for final weight, weight gain, daily weight gain and feed conversion ratio. However, a non-significant ($p>0.05$) difference was observed for initial weight, daily forage intake, daily concentrate intake and total daily feed intake. The significant difference ($P<0.05$) recorded for final weight, weight gain, daily weight gain and feed conversion ratio could be as a result of the improvement of the feed consumed by the rabbits, aided by the enrichment of the

CPM with trona and lysine. Value obtained for final weight, weight gain, and daily weight gain ranged from 1173.11 -1286.00g, 720.00 – 839.50g and 12.86 – 14.99g respectively, with higher significant value recorded in T3 (trona+lysine) and lower value recorded in T2 (Salt-lysine). Results obtained corroborate with the findings of Evans *et al*., 2023, who fed weaner rabbits with sun-dried cassava peel as replacement for maize and Adeyemi *et al*., 2014, who fed growing rabbits with diet containing fermented and unfermented cassava leaf: peel meal mix as a replacement for maize. However, these findings as well disagreed with the results of Shaahu *et al*., 2022, who fed growing rabbit with spent sorghum residue-cassava peel composite meal as a replacement for maize. Despite the non-significant variation (P>0.05) recorded for initial weight, daily forage intake, daily concentrate intake and total daily feed intake, values obtained were closely similar across the treatment group. The significant improvement recorded as for some of the parameters for this study could be as a result of the exogenous enzymes (trona+lysine) added to the experimental diet. Exogenous enzymes improve the efficiency of the utilization of feed ingredients like protein, amino acids, lipids and starch.

Table 3: Growth Performance of growing rabbits fed cassava peel meal enriched with trona and table salt with or without lysine

Parameters	UTCPM (SALT+LYSINE) T1	UTCPM (SALT-LYSINE) T2	UTCPM (TRONA+LYSINE) T3	UTCPM (TRONA-LYSINE) T4	SEM	LOS
Initial Weight (g)	441.39	453.11	446.50	450.81	12.10	NS
Final Weight (g)	1181.39^{b}	1173.11^{b}	1286.00^{a}	1194.00^{b}	21.02	*
Weight gain (g)	740.00^{ab}	720.00^{b}	839.50^{a}	744.00^{ab}	19.02	*
Daily Weight gain (g)	13.21^{ab}	12.86^{b}	14.99^{a}	13.29^{ab}	0.76	*
Daily Forage Intake (g)	57.12	55.10	58.36	60.03	3,21	NS
Daily Conc. Intake (g)	68.18	71.16	70.31	69.12	3.44	NS
Total daily feed Intake (g)	125.28	126.26	128.67	129.15	5.21	NS
Feed Conversion Ratio (%)	9.48^{b}	9.82^{a}	8.58^{c}	9.72^{a}	0.13	*

^{abc} means with different superscripts across the same row are significantly different (P<0.05). SEM = Sum of Error of Mean. LOS = Level of Significance, NS = Not Significant, * = Significant

CONCLUSION

Based on the results obtained from this study, it can be concluded that cassava peel meal (CPM) supplemented with trona and lysine enhances the performance of growing rabbits.

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