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Effect of Replacing Groundnut (Arachis Hypogaea) Hay with Morning Glory (Ipomea Asarifolia) Hay on Weight Gain of Weaner Rabbits

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Abstract: ***Rabbit production has numerous advantages which has led to its increased production. Rabbit can supply the needs of an average family and is a suitable and cheaper alternative to some protein sources. Rabbits have also been used as a means of reducing poverty in developing countries. Morning glory (Ipomea asarifolia) is a plant found in abundance in different parts of Nigeria with no monetary value attached to it. Morning glory appears to be consumed by rabbit without any detrimental effect. However, its effect on production performance of rabbits is not known. The aim of this study was therefore to investigate the effect of replacing groundnut hay with morning glory leaf meal on weight gain of rabbits. Eighty four (84) weaner rabbits were divided into four groups with each group having seven (7) rabbits. Four treatments T1(0%), T2(2.5%), T3(5%) and T4(10) were assigned to each group with each group being replicated three times. Data was analysed using one-way ANOVA with Tukey's HSD as the post hoc test. There was no significant difference in weight gain of rabbits between treatments except T2 which was significantly (p<0.05) lower than the other treatments. It was concluded that morning glory hay can be conveniently used to replace groundnut hay without affecting production performance of rabbits thus lowering production cost.***

Keywords: forage, Ipomea asarifolia, morning glory, rabbits, weight gain.

I. INTRODUCTION

Rabbit production has numerous advantages which have led to its increased awareness as a means to reduce food shortages (Baruwa, 2014). Among the numerous advantages of rabbit include high rate of reproduction; early maturity; small body size; rapid growth rate comparable to that of broiler chicken (Rao *et al*., 1977) high genetic selection potential; efficient feed and land space utilization, limited competition with humans for similar food; and high quality nutritious meat (Cheeke, 1980; Arijeniwa *et al*., 2000). Rabbit can supply the needs of an average family and is a suitable and cheaper alternative to some protein sources which can increase the protein consumption of households in Nigeria (Ogbonna, 2015). Rabbit is a micro-livestock that can produce about 47 kg of meat per doe per year, which is enough to solely meet the animal protein requirements of a medium sized family under small scale rural farming systems (Adedeji *et al*., 2012; Hassan and Owolabi, 1996). Besides, rabbit meat is rich in vitamin B and extremely low in cholesterol and sodium levels (Jithendran, 2000; Omole *et al*., 2005). Rabbits have also been used as a means of reducing poverty in developing countries (Oseni and Lukefahr, 2014). They have been used in development and poverty reduction programmes due to their low investment and early benefits, and subsistence on renewable resources for feeding, housing and general management.

Feed accounts for the largest part of the production costs in animal production, and could reach up to 70% of total costs of production. Feeding costs represent up to 60% of the total cost of rabbit production in France (Coutelet, 2015) and Sierra Leone (Franck *et al*, 2016). Therefore, the use of available and cheap ingredients to feed rabbit is highly recommended to reduce

production cost. Rabbit has the ability of turning forage into high protein and yet remains within the investment ranges of the poorest families (Smith, 1991).

Rabbits are commonly fed with forages like groundnut hay and cowpea hay but these feedstuffs are becoming more expensive because of their utilization as feeds in ruminant production. There is need to identify cheap alternative feedstuffs which can be used to feed rabbits to lower its production cost. Morning glory (*Ipomea asarifolia*) is a plant found in abundance in different parts of Nigeria. The plant is mostly considered as a weed and it is seldom grazed by ruminants hence it has no monetary value attached to it. Morning glory however appears to be consumed by rabbit without any detrimental effect. The effect of utilizing Morning glory as forage on production performance of rabbits is however not known. This study therefore seeks to investigate the effect of replacing groundnut hay with morning glory hay on weight gain of rabbits.

II. MATERIALS AND METHODS

The research was conducted at Rabbit Research Unit at the Department of Agricultural Education, Federal College of Education, Katsina. The Morning glory used was green and obtained from the college. Ground nut hay, maize and soybean meal were purchased from the market.

A. Processing of Morning glory Leaf Meal

Morning glory leaves was collected from the local environment of the college, chopped, dried under shade, and grinded in to smaller particles then included in to the feed of the research animals. The chemical composition of *Ipomea asarifolia* (Table 1) was determined by the standard method of AOAC (1995) and mineral analysis by methods of Grueling (1966) while gallen kamp oxygen adiabatic bomb calorimeter were used to determine gross energy.

Table 1: Proximate Analysis of *Ipomea asarifolia* leaf meal

Nutrients	Values (%)
Crude fibre	17
Crude protein	31.7
Ash	6.9
Ether extract	7.8
Moisture	14.89
NFE	20.63
Metabolizable energy kcal/kg	2751.00

B. Formulation of experimental diets

Four different diets were formulated for the replications of the experimental rabbits as T1, T2, T3, and T4 which contained 0%, 2.5%, 5% and 10% levels of processed *Ipomea asarifolia* leaf meal respectively with 0% level as the control. The feed composition is contained in Table 2.

C. Experimental animals, design and management

The research animals are indigenous weaner rabbit and were kept in hutches in the College rabbit house, were dewormed and injected with ivermectin. Eighty four (84) indigenous weaner rabbits were divided into four different treatments and each treatment with three replications containing seven research animals each in a completely randomised block design (CRBD). Initial weight of the rabbits was taken before treatment allocation and weighing continued on weekly basis throughout the period of the experiment which lasted for twelve weeks. Data was analysed using one-way ANOVA (IBM SPSS version 22) with Tukey's HSD as the post hoc test.

III. RESULTS AND DISCUSSION

The experimental rabbits at T1 (0%), T3 (5%), and T4 (10%) had similar initial weights of 1.19kg, 1.23kg, and 1.18kg respectively. The initial weight of T2 (2.03kg) showed a significant difference ($P<0.05$) between the remaining treatments. The final live weights of the experimental animals were 3.38kg, 3.30kg, 3.20kg, and 3.28kg for T1 (0%), T2 (2.5%), T3 (5%), and T4 (10%) levels which showed no significant difference ($P>0.05$) between the treatments. The average weight gain of T1, T3, and T4 were significantly different ($P<0.05$) with that of T2, but rabbit in the control (T1) had the highest average weight gain. The average daily weight gain of T1, T2, T3, and T4 are 26.1kg, 15.1kg, 23.5kg and 25.0kg respectively. This showed that T1, T3, and T4 were significantly ($P<0.05$) different from T2. This suggest the rejection of T2 (2.5%) as it has the highest initial weight (2.03kg) but ended with least weight parameters. This shows that the level of morning glory inclusion at that treatment was abnormal. This finding is not in consistent with Esonu *et al*. (2002) who revealed that *Microdesmis purberula* at 15% inclusion level depressed growth. Conversely, Iyayi (2001) reported that supplementing cassava leaves up to 20% improved feed intake and weight gain of pigs. The result of these findings indicated that the higher the level of inclusion of morning glory in the diet, the higher the performance. This will reduce the cost of production on feeds as advocated by Esonu *et al.* (2002) to use the available non-conventional and indigenous feed sources which are not competed for between man and animals. But these findings disagree with Ekenyem (2006) who reported that inclusion of *Ipomea asarifolia* leaf meal beyond 5% reduced growth rate of grower pig.

Table 2: Composition of Experimental Diets (%)

	T1	T2	T3	T4
Maize	50.16	50.16	50.16	50.16
Soybean meal	15.64	15.64	15.64	15.64
G/nut hay	10	7.5	5	0
Morning glory	0	2.5	5	10
Bone meal	2	2	2	2
Limestone	1.5	1.5	1.5	1.5
Salt	0.25	0.25	0.25	0.25
Premix	0.25	0.25	0.25	0.25
Lysine	0.1	0.1	0.1	0.1
Methionine	0.1	0.1	0.1	0.1
Wheat offal	20	20	20	20

Table 3: Weight gain of rabbits fed with various levels morning glory

Parameters	T1	T2	T3	T4	SEM	*p*-values
Mean initial weight (kg)	1.19[a]	2.03[b]	1.23[a]	1.18[a]	0.096	<0.05
Mean final weight (kg)	3.38	3.30	3.20	3.28	0.039	NS
Average weight gain (kg)	2.19[b]	1.27[a]	1.97[b]	2.10[b]	.095	<0.05
Average daily weight gain (g)	26.1[b]	15.1[a]	23.5[b]	25.0[b]	1.125	<0.05

[ab] across columns indicates significant difference using Tukey's HSD

IV. CONCLUSION

The study reveals that morning glory is a good forage which can conveniently replace more expensive forages like groundnut hay while maintaining same level of performance in rabbit production. It is suggested that a standard feeding package for rabbits using morning glory as the main forage be developed and produced as feeding guidelines for farmers. Morning glory hay can be conveniently used to replace groundnut hay without affecting the production performance of rabbit. Morning glory appears to be consumed by only rabbits without detrimental effects, it can therefore be judiciously utilized.

V. RECOMMENDATIONS

A. Further research should be done to determine the anti-metabolites present in the *Ipomea asarifolia.*

B. More works needs to be carried out on the hematological effect of Morning glory on its feeding to the rabbits.

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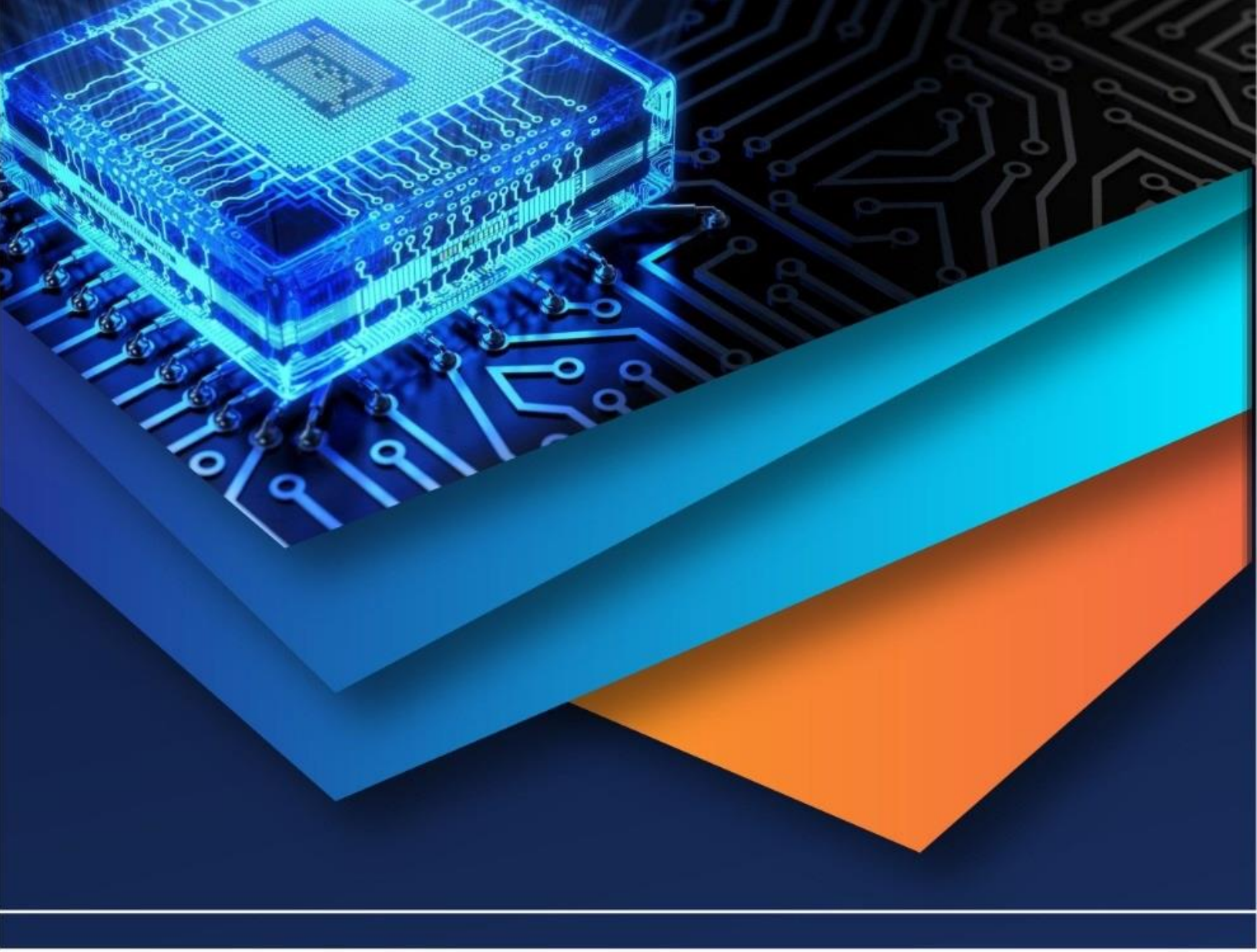

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