

Replacement of Conventional Feed with Morning Glory as a Strategy for Reducing Cost of Feeding Rabbits for Increasing Employment in Nigeria

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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. However, feeding costs represent up to 60% of the total cost of rabbit production. Therefore, the use of available and cheap ingredients to feed rabbits is highly recommended to reduce production costs. 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 rabbits without any detrimental effect. However, its effect on the production performance of rabbits is not known. Therefore, this study aims to investigate the effect of replacing groundnut hay with morning glory hay on the weight gain of rabbits. Eighty-four (84) weaner rabbits were divided into four groups, each having seven (7) rabbits. Four treatments, T1, T2, T3 and T4, were assigned to each group, with each group being replicated three times. Data were 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 could be conveniently used to replace groundnut hay without affecting the production performance of rabbits, thus lowering production costs.

Keyword: forage, *Ipomea asarifolia*, morning glory, rabbits, weight gain.

Introduction

Rabbit production has numerous advantages, which has led to its increased awareness to reduce food shortages (Baruwa, 2014). Among the numerous advantages of rabbits include a 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 utilisation, 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, increasing 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 to reduce 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 most significant 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, using available and cheap ingredients to feed rabbits is highly recommended to reduce production costs. Rabbit can turn forage into high protein 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 utilisation as feeds in ruminant production. There is a need to identify cheap alternative feedstuffs which can be used to feed rabbits to lower their production cost. Morning glory (*Ipomea asarifolia*) is a plant found in abundance in different parts of Nigeria. The plant is mainly considered a weed and seldom grazed by ruminants; hence, it has no monetary value. Morning glory, however, appears to be consumed by rabbits without any detrimental effect. However, the effect of utilising Morning glory as forage on rabbits' production performance is not known. Therefore, this study seeks to investigate the effect of replacing groundnut hay with morning glory hay on the weight gain of rabbits.

Materials and Methods

The study area is Katsina state, and the experiment was conducted in Federal College of Education Katsina. The research animals were kept in hutches in the College rabbit house. Eighty-four (84) weaner rabbits were divided into four different treatments, and each treatment with three replications containing seven research animals each. The treatments are given in Table 1 below. The research was conducted using a completely randomised block design (CRBD). Morning glory was collected from the local environment, chopped and dried under shade and then fed to the research animals. Cowpea hay, wheat bran and cottonseed cake/groundnut cake (ONC) were purchased from the market. Cowpea hay, morning glory and water were fed ad libitum while ONC and wheat bran were fed twice a day, i.e. morning and evening.

Table 1: The research animals were fed according to the following feeding ratio:

Treatments	T1	T2	T3	T4
Cowpea hay (%)	100	75	25	0
Morning glory (%)	0	25	75	100

The initial weight of the rabbits was taken before treatment allocation, and weighing continued weekly throughout the experiment. Average weight gain was calculated by subtracting the initial weight from the final weight of rabbits. Data were analysed using one-way ANOVA (IBM SPSS version 22) with Tukey's HSD as the post hoc test.

Results and Discussion

Table 2: 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 ^a	3.30 ^a	3.20 ^a	3.28 ^a	0.039	NS
Average weight gain (kg)	2.19 ^b	1.27 ^a	1.97 ^b	2.10 ^b	0.95	<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 a significant difference using Tukey's HSD

The experimental rabbits at T1 (0%), T3 (50%), and T4 (100%) had similar initial weights of 1.19 kg, 1.23 kg, and 1.18 kg, respectively. The initial weight of T2 (2.03 kg) showed a significant difference ($P < 0.05$) between the remaining treatments. The final live weights of the experimental animals were 3.38 kg, 3.30 kg, 3.20 kg, and 3.28 kg for T1 (0%), T2 (25%), T3 (50%), and T4 (100%) levels which showed no significant difference ($P > 0.05$) between the treatments. The average weight gain of T1, T3, and T4 were significantly different ($P < 0.05$) from that of T2, but rabbits in 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 suggests the rejection of T2 (25%) as it has the highest initial weight (2.03 kg) but ends with the least weight parameters. This shows that the level of morning glory inclusion at that treatment was abnormal. This finding is inconsistent 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. 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. However, these findings disagree with Ekenyem (2006), who reported that the inclusion of *Ipomea asarifolia* leaf meal beyond 5% reduced the growth rate of grower pig.

Conclusion

The study reveals that morning glory is a good forage that can conveniently replace more expensive forages like groundnut hay while maintaining the 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.

Recommendations

- ❖ Morning glory hay can be conveniently used to replace groundnut hay without affecting the production performance of rabbits.
- ❖ Morning glory appears to be consumed by only rabbits without detrimental effects. It can therefore be judiciously utilised.

- ❖ Morning glory has no monetary value attached to it. Therefore it can be used in place of groundnut hay to reduce the cost of production.
- ❖ More research needs to be carried out on the haematological effect of Morning glory on its feeding to the rabbits.

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