

EVALUATION OF *MONODORA MYRISTICA* (AFRICAN NUTMEG) AS FEED ADDITIVE ON THE PERFORMANCE OF RABBITS

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ABSTRACT

This study was aimed at evaluating the performance effect of African nutmeg (*Monodora myristica*) as feed additive in rabbits. A total of forty eight (48) weaned rabbits were allotted to four experimental diets in a completely randomized design. Each group was replicated three times with four rabbits per replicate and the experiment lasted for twelve weeks. Treatment 1 was basal diet without additive, T₂ was basal diet with 1% inclusion of *M. myristica*, T₃ was basal diet with 2% *M. myristica* while T₄ was basal diet with 3% *M. myristica* inclusion. Results revealed that rabbits fed *Monodora myristica* as feed additive recorded significantly ($P<0.05$) higher feed intake and body weight gain, compared to those on the control group. Rabbits in T₃ group recorded the highest values for all parameters assessed. Feed conversion ratio recorded significant ($P<0.05$) differences across treatments. Rabbits fed 2% levels of the test ingredient recorded the lowest and best FCR. Mortality was not recorded in the course of the experiment. It can be concluded that *Monodora myristica* can be included in the diets of weaner rabbits up to 2% without an adverse effect on their health. Hence, it can be used as an alternative to antibiotic growth promoter in improving the performance of weaner rabbits.

Keywords: Additives, Growth promoter, *Monodora myristica*, Performance, Weaner rabbits

INTRODUCTION

Antibiotic growth promoters has over the years been used by farmers to achieve growth in livestock and also for the treatment and prevention of certain livestock diseases and infections. However, following the recent ban on their usage by many countries due to a reduced social acceptance by consumers of animal products for fear of residual deposits, there has been a search for alternative replacements (Onunkwo *et al.* 2022). To fill this gap, the use of natural feed additives from plant origin as growth promoters have been employed. These natural additives have been scientifically proven to be safer, cleaner, healthier, less hazardous and above all, do not leave residual effect on the animal products (Okon *et al.* 2022). Many herbs and spices, including *Monodora myristica* are enriched in antibiotic properties, antioxidant properties, antimicrobial activities, which makes them fit for use as natural feed additive (Ekunseitan *et al.*, 2016). *M. myristica* is used as a spice in the preparation of hot soup for new born mothers to prevent hemorrhage and to facilitate the flow of milk immediately after childbirth (Onyenibe *et al.*, 2015). This study was carried out to investigate the effect of *M. myristica* seed meal on the performance of weaner rabbits.

MATERIALS AND METHODS

Experimental location

The study was conducted at the Department of Animal Science Teaching and Research Farm, Akwa Ibom State University, Obio Akpa Campus for a period of twelve weeks. The area is situated between latitude 4°30'N and longitude 7°30'E (SLUK-AK, 1989).

Experimental sample preparation

The seeds of *Monodora myristica* were purchased from Itam market in Uyo Local Government Area of Akwa Ibom State. They were thoroughly washed under running water and sundried. The dried seeds of *Monodora myristica* were ground into powder form after toasting to obtain *Monodora*

myristica seed powder (MMSP). The ground material was stored in polythene bags under room temperature until it was ready for use (Coleman *et al.*, 2017).

Experimental diet

Four experimental diets designated as T₁, T₂, T₃ and T₄ were formulated. Treatment 1 was basal diet without additive, T₂ was basal diet with 1% inclusion of *M. myristica*, T₃ was basal diet with 2% *M. myristica* while T₄ was basal diet with 3% *M. myristica* inclusion.

Table 1: Ingredients and nutrients composition of the experimental diet for rabbits

Ingredients	T ₁ (0%)	T ₂ (1%)	T ₃ (2%)	T ₄ (3%)
Maize	50.000	50.00	50.00	50.00
Fish meal	1.50	1.50	1.50	1.50
Soybean meal	18.50	18.50	18.50	18.50
Wheat offals	27.00	26.00	25.00	24.00
MMSP	0.00	1.00	2.00	3.00
Bone meal	2.00	2.00	2.00	2.00
Lysine	0.25	0.25	0.25	0.25
Methionine	0.25	0.25	0.25	0.25
Salt	0.25	0.25	0.25	0.25
Vit/min Premix**	0.25	0.25	0.25	0.25
Total	100	100	100	100
Calculated analysis				
Crude protein (%)	18.21	18.21	18.21	18.21
M.E (Kcal/kg)	2978.34	3024.33	3028.14	3039.24

* Vitamin-mineral premix provided per kg the following: Vit. A 1500 IU; Vit.D3 3000 IU; Vit.E 30 IU; Vit.K 2.5mg; Thiamine B1 3mg; Riboflavin B2 6 mg; Pyrodoxine B6 4 mg; Niacin 40 mg; Vit. B12 0.0 mg; Pantothenic acid 10 mg; MMSP = *Monodora myristica* seed powder

Management of experimental animals/design

A total of 48 cross bred weaner rabbits were purchased from reputable farms in Uyo, Akwa Ibom State. The animals were weighed and randomly allotted into four treatment groups of 12 rabbits each in a randomized complete block design. The treatments were replicated three times with four rabbits making a replicate. Prior to the commencement of the study, preconditioning and acclimatization of the animals was carried out for 2 weeks to ensure that they adapt to the experimental environment. Feed and drinking water were offered *ad libitum* to the experimental animals. The experiment lasted for a period of 12 weeks.

Data collection and statistical analysis

At the commencement of the study, the rabbits were weighed using an electronic scale to obtain their initial weights. Weekly body weights were afterwards taken and recorded. Feed intake per rabbit was calculated as the difference between the feed offered and left over after a 24-hour feeding. Live weight gain per rabbit was calculated as the difference between previous weight and weights recorded in the following week. The ratio of feed taken to weight gained after a week of feeding was used to calculate the feed conversion ratio. The formula is thus stated, Feed conversion ratio = feed intake/weight taken (Nuamah *et al.* 2019). Data collected were subjected to analysis of variance (ANOVA) according to Steel and Torrie (1980) and mean were separation using Duncan's Multiple Range test (Duncan, 1955) at 0.05 level of significance.

RESULTS AND DISCUSSION

The effect of *Monodora myristica* on the feed intake, weight gain and feed conversion ratio of rabbits is presented in Table 2. Significant ($P<0.05$) differences were observed in total weight gain, average daily weight gain, average daily feed intake and feed conversion ratio of the rabbits across the treatments. Rabbits fed T_3 -based diet recorded the highest total weight gain and average daily weight gain values. The increase in weight of T_3 group was attributed to an increased feed intake as well as the different biological activities of the spices such as antibacterial, antifungal, antioxidants, and as a growth promoter. This is in agreement with Ukoha and Onunkwo (2017) and Guru *et al.* (2022) who fed *Monodora myristica* and ginger extracts to Japanese quails and broiler chickens respectively. Significant ($P<0.05$) differences were also recorded in the feed intake of the experimental animals across treatment groups. Rabbits fed T_3 and T_4 based diet recorded highest feed intake values while the lowest was observed for those placed on the control (T_1) diet. The high feed intake may be attributed to the increased flavonoids from the essential oil components in the seed which led to the acceptability of the feed and stimulation of appetite in the animals. This is in line with the report of Ukoha (2016) who fed broiler birds with *Monodora myristica*. Also, the rich mineral and vitamin components of most spices including *Monodora myristica* is responsible in the stimulation of appetite in the animals fed the test ingredient. This is in consonance with the report of Adepoji and Oyewole (2008). Feed conversion ratio was significantly ($P<0.05$) higher in the control group (12.37) compared to other treatments. Rabbits in T_3 group however, recorded the least and best FCR. This observation strengthens the report of Hassan *et al.* (2004) that the addition of spice additives in the diets of livestock bring about an improvement in their feed conversion ratios.

Table 2: Effect of *Monodora myristica* seed powder on the performance of weaner rabbits

Parameters	T_1 (0% MMSP)	T_2 (1% MMSP)	T_3 (2% MMSP)	T_4 (3% MMSP)	SEM
Initial weight (g)	689.50	698.81	701.05	703.00	23.55
Final weight (g)	1582.00	1531.33	1760.03	1685.47	47.72
Total weight gain(g)	501.13 ^b	663.31 ^{ab}	700.71 ^a	674.50 ^{ab}	64.69
ADWG (g)	8.04 ^b	9.48 ^{ab}	10.01 ^a	9.64 ^{ab}	0.58
ADFI (g)	99.48 ^c	106.45 ^b	110.91 ^a	112.76 ^a	1.85
FCR	12.37 ^a	11.23 ^b	11.08 ^b	11.69 ^b	1.18
Mortality (%)	0.00	0.00	0.00	0.00	0.00

ADWG = Average daily weight gain, ADFI = Average daily feed intake, FCR = Feed conversion ratio, g = grams

abc: Means with different superscripts in the same row are significantly ($P<0.05$) different

CONCLUSION AND RECOMMENDATION

Based on results, it can be concluded that the supplementation of rabbit diets with *Monodora myristica* increased the weight gain and improved feed intake significantly. The inclusion level of 2% MMSP gave a better performance in relation to other treatment groups.

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