

Evaluation of Reproductive Performance of Rabbits Fed Graded Levels of *Moringa oleifera* Leaves and Twigs Meals

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Abstract:-

Objective: This study was carried out to evaluate the reproductive performance of rabbits fed *Moringa oleifera* leaves meal and *Moringa oleifera* twig meal at 0% 5% and 10% leaves meal (MLM) and 10% twigs meal (MTM).

Method: Twenty Female grower rabbits of mixed breed with mean Initial weight of 2323.25 ± 33.12 and five New Zealand White buck. The animals were randomly allocated in completely randomized design. The data collected includes feed intake, conception rate, litter size, litter weight, weaning weight, and average daily weight gain and litter survival rate. Data were analysed using descriptive statistic and ANOVA at $\alpha_{0.05}$.

Result and discussion: The results obtained reveals that feed intake, litter size and average daily weight gained were not significantly different. However conception rate was significantly ($P > 0.05$) affected. The litter weight after birth was significantly higher in rabbits fed 10% MLM with least litter weight in rabbits fed no MLM/MTM. The weaning weight was higher in 10% MTM while 5% MLM had the least value. The survival rate was significantly higher in rabbits fed 10% MLM with least survival rate recorded for rabbits fed no MLM/MTM. In conclusion, *Moringa oleifera* leaves/twigs meals at 10% are excellent feed resources for breeding rabbit.

Keywords: Rabbits, reproductive performance, *Moringa oleifera*, weaned weight, litter size

I. INTRODUCTION

Rabbits are unique animals. They serve as a flexible financial reserve for rural population and as well play other socio-cultural roles in the customs and traditions of many Nigerian Societies [1]. The prolific nature of rabbits coupled with its short gestation period and generation interval, makes it the animal of choice for multiplication and a short way of increasing animal protein intake [2].

Although rabbits can survive on all forage diet, optimum performance can only be ensured in a mixed feeding regime

involving forage and formulated feeds ([3], [4]). The profitability of rabbit production as an enterprise depends on the number of rabbits kindled per doe per year and the postnatal survival of the kids. Nutrition is one of the factors that could limit productivity especially during pregnancy and lactation [3].

The use of leaf meal and twig meal in livestock feed composition helps to reduce the cost of production [5] enhance reproductive performance [6] enhance health status and promote growth [7] of farm animal, thus increasing overall livestock production when used as a feed component or additive.

Such leaf meal and twig meal are *Moringa* plants. *Moringa oleifera* Lam belongs to monogeneric family of shrubs and tree. The plant possesses many valuable properties which made it of great scientific interest [8]. Different morphological parts of the tree has been evaluated as a potential animal feed ingredient with the crude protein (CP) content of fresh leaves, soft twigs and stems as 260, 70 and 60 g kg⁻¹ respectively [9].

Enhance, this study was carried out to evaluate the reproductive performance of rabbits fed *Moringa oleifera* leaves meal and *Moringa oleifera* twig meal.

A. Materials and Methods

The rabbit used in this experiment was collected from Rabbitry section of Dagwom Farm Division, National Veterinary Research Institute Vom. The authentication and identification was done by Philips M. Goholshak

B. Area of Study

Rabbitry section of Dagwom Farm Division, National Veterinary Research Institute Vom; Vom is located on longitude 8⁰ 45E and latitude 9⁰ N in the mountain savannah ecotype of Plateau state, North Central Nigeria.

C. Experimental Animals

Twenty female growers of mixed breed with a mean initial weight of 2323.25 ± 33.12 and five New Zealand white buck were used for the experiment.

D. Preparation of experimental diets

Fresh *moringa oleifera* leaves were obtained from the Moringa plantation of Dagwom Farm NVRI, Vom. The leaves were shed dried at room temperature until they are crispy to touch. Four diets A, B, C, and D was formulated to contain 0%, 5%, and 10% (leaves meal) and 10% (twigs meal).

E. Experimental design

The female growers were randomly allocated to four dietary treatments of five rabbits each, with each rabbit representing a replicate in a completely randomised design. The rabbits were fed ad libitum with the corresponding diet and fresh clean water for four weeks before mating commences. Routine health management and sanitation were strictly adhered to. The experiment lasted sixteen weeks in all.

F. Data collection and analysis

The data collected includes feed intake, conception rate, litter size, litter weight, weaning weight, and average daily weight gain and litter survival rate. The data collected were subjected to the analysis of variance and means were separated using Duncan's multiple range test according to the procedures outlined by [10]

TABLE 1: GROSS COMPOSITION OF THE EXPERIMENTAL DIET

Ingredients	T1	T2	T3	T4
Maize	44.00	44.25	44.75	44.75
Full fat soya	16.75	14.50	14.00	14.00
Wheat offals	35.00	32.00	27.00	27.00
Moringa leaf	0.00	5.00	10.00	0.00
Moringa Twig	0.00	0.00	0.00	10.00
Salt	0.30	0.30	0.30	0.30
Premix	0.25	0.25	0.25	0.25
Bone	2.50	2.50	2.50	2.50
Limestone	1.00	1.00	1.00	1.00
Methionine	0.10	0.10	0.10	0.10
Lysine	0.10	0.10	0.10	0.10
	100.00	100.00	100.00	100.00
Calculated analysis				
Crude protein	16.10	16.13	16.52	16.35
Metabolisable energy	2717.00	2727.00	2779.00	2748.00
Crude fiber	5.00	5.54	6.03	6.31

T1= control without Moringa leaf meal and twig meal

T2= contain 5% Moringa leaf meal and twig meal

T3= contain 10% Moringa leaf meal and twig meal

T4= contain 10% Moringa leaf meal and twig meal

II. RESULTS

Figure 1 shows the feed intake of rabbit does fed *Moringa oleifera* meal and twig meal. There were no significant differences in the feed intake by the does on all the treatment but treatment 3 with 10% *Moringa oleifera* meal (126.00g) had the highest value while treatment 2 (177.00g) the least feed intake. The reproductive performance was shown on Table 2. The feed intake by does and litters, conception rate, litter weight, weaning weight and survival rate were significantly differences. Does and litters fed *Moringa* leaf meal (MLM) at 10% had the highest feed intake (222.00g) with least feed intake by does and litters fed *Moringa* twig meal (MTM) 192.00g. The conception rate in % was higher in does fed 10% MLM (100%) with least conception rate in does fed 0% MLM and MTM. Litter in treatment 2 (5% MLM) recorded the highest litter size at birth though not significantly different. The litter weight at birth was significantly differs as shown on Figure 2, with highest value in treatment 3 and 4 (10% MLM) 62.75g and 61.50g respectively while treatment 1 with no MLM and MTM had the lowest litter size (48.75g). At weaning, rabbits on diet 4 (10% MTM) had the highest wean weight (818.00g) with least wean weight in treatment 2 (5% MLM). Kids on diet 3 had the highest survival rate 86.00% followed by treatment 2 with least survival rate in kids on diet 1 with no MLM and MTM.

III. DISCUSSION

Does and litters fed *Moringa* leaf meal (MLM) at 10% had the highest feed intake (222.00g) with least feed intake by does and litters fed *Moringa* twig meal (MTM) 192.00g. The conception rate in % was higher in does fed 10% MLM (100%) with least conception rate in does fed 0% MLM and MTM. The result obtained could be as a result of effectiveness of dietary fibre utilization which shows great potential for health, welfare and reproductive performance of livestock [11] The result obtained in this study was higher than the data recorded by [3] litter size at birth of 4.06 - 5.8. These values of litter size obtained was not in agreement with the report of [12]. Also [13] obtained a lower litter size. The better performance obtained in this study could be attributed to factors of good mothering ability, maternal environment and effect of dietary fibre inclusion ([14], [15], [11]). The litter weight at birth in this study was lower than the result obtained by [16] and [3]. Rabbit fed 10% MTM had the highest weaning weight with least weaning weight in rabbits fed 5% MLM. The average daily weight gains of the kids obtained by [3] were 6.99, 8.06, 8.64, 8.13 and 6.78 g/day for Moringa at 0 to Moringa at 100, respectively was lower than the result obtained in this study. These values are higher than the weight gains (3.09, 6.5 g/day) reported by [17] and [14], respectively. This could be attributed to the type of breeds. Survival rate in this study ranged 68% to 86% which was in agreement [3] and [14]. The best performance of diet 3 could be attributed to good mothering ability ([17], [15]) and effectiveness of dietary fibre utilization which shows great

potential for health, high crude protein, welfare and reproductive performance of livestock [11]

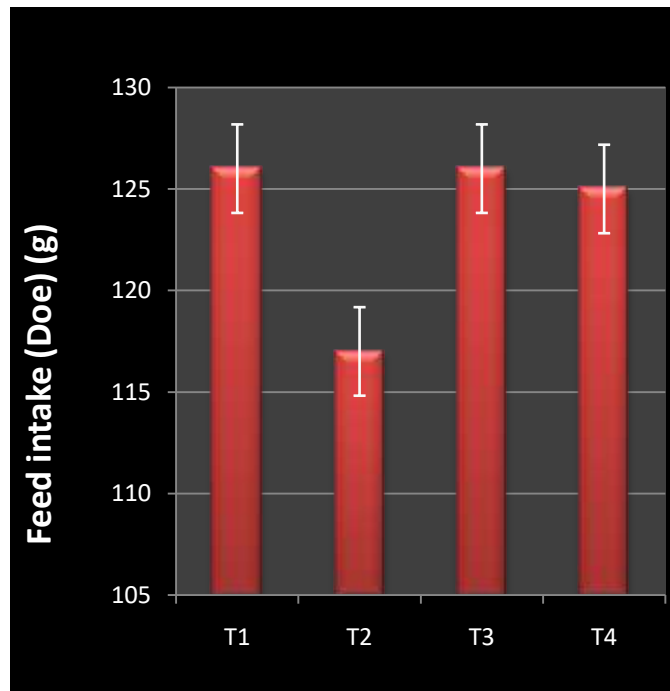


Figure 1: Feed intake of rabbits fed graded levels of Moringa leaf meal and twig meal

T1= control without Moringa leaf meal and twig meal
 T2= contain 5% Moringa leaf meal
 T3= contain 10% Moringa leaf meal
 T4= contain 10% Twig meal

TABLE 2: REPRODUCTIVE PERFORMANCE OF RABBIT DOES FED MORINGA OLEIFERA MEAL AND TWIG MEAL

Parameters	T1	T2	T3	T4	SEM
Feed intake (Doe/Litter)g	202.00 ^b	202.00 ^b	222.00 ^a	192.00 ^c	3.51
Conception rate (%)	75.00 ^b	80.00 ^b	100.00 ^a	80.00 ^b	3.14
Litter size (No)	7.75	9.25	7.25	8.00	1.25
Litter weight (g)	48.75	59.75	62.75	61.50	2.07
Weaning Weight (g)	718.00	701.00	727.00	818.00	13.75
AVD Wt G (g)	15.94	15.27	15.82	17.96	1.27
Survival rate (%)	68.00 ^b	75.00 ^b	86.00 ^a	73.00 ^b	2.33

T1= control without Moringa leaf meal and twig meal
 T2= contain 5% Moringa leaf meal
 T3= contain 10% Moringa leaf meal
 T4= contain 10% Twig meal
 AVDWtG= Average daily weight gained.
 SEM= Standard error mean

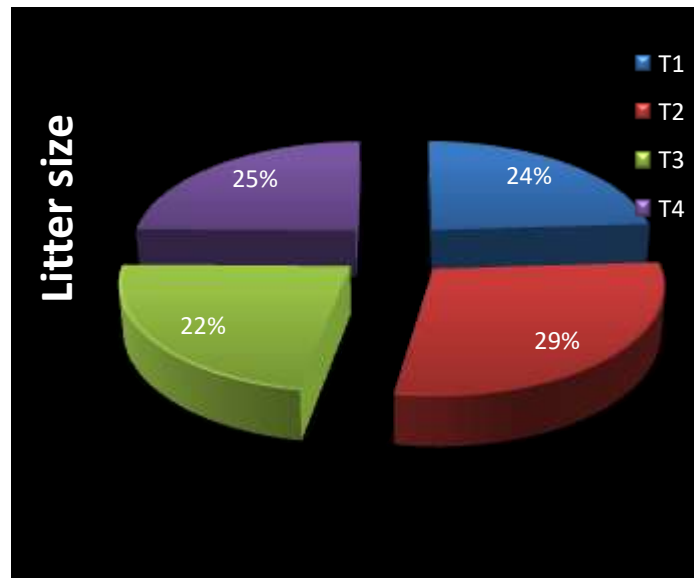


Figure 2: Litter size of rabbits fed graded levels of Moringa leaf meal and twig meal

T1= control without Moringa leaf meal and twig meal
 T2= contain 5% Moringa leaf meal
 T3= contain 10% Moringa leaf meal
 T4= contain 10% Twig meal

IV. CONCLUSION

It could be concluded that feeding growing rabbits with Moringa Olifera leaves/ twigs meals as high as 10% inclusion rates helped to enhanced their reproductive performance. It is recommended that Moringa olifera be included in the diets of rabbits to improve their reproductive performance and productivity

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