



Full Length Research Paper

**The Effects of Drumstick Tree (*Moringa oleifera*) Leaf Meal on the Average Weight Gain of Domestic Rabbits (*Oryctolagus cuniculus*).**

Ufele, A. N., Ebenebe, C. I., Igwe, I. I., Mogbo, T. C., Akunne, E. C. and Aziagba, B. O.  
Corresponding author's E-mail [ufeleangel@yahoo.com](mailto:ufeleangel@yahoo.com)

**ABSTRACT**

A study was conducted to evaluate the effect of *Moringa oleifera* leaf meal on the weight gain of weaner rabbits. Three diets were formulated; Diet one (T1) which contained neither soya bean meal nor *Moringa* leaf meal served as the control diet. Diet two (T2) contained soya bean meal without *Moringa* leaf meal, while diet three (T3) contained *Moringa* leaf meal without soya bean meal. Thirty-six rabbits of 40 days old were used for the study with each treatment cage containing four rabbits of average weight of 480g per rabbit. There was significant difference ( $P < 0.05$ ) among all the treatments in average weight gain (256.25g, 365.00g and 483.75g) respectively. T3 had the highest percentage (81.48%) followed by T2 (78.95%) with the least being T1 (52.69%). No mortality was recorded during the experimental period. The study revealed that diet three, T3 (20% *Moringa oleifera* leaf meal) is rich in nutrients. It also showed that the *Moringa oleifera* leaf meal could be used as total replacement for soybean meal in rabbit diet without any adverse effect on the weight gained. It also showed that rabbits cannot perform well when fed only millet mash residue without supplemental protein source.

**Key words:** *Moringa oleifera*, weaner *Oryctolagus cuniculus*, weight, and leaf meal.

**INTRODUCTION**

Protein supplementation is often important to improve livestock performance, and this needs to be done with respect to the requirements of the animal in addition to the balance of other nutrients available. Soya bean meal and fish meal have been widely and successfully used as conventional protein sources for livestock. However, the prices of these protein sources have been escalating continuously in recent times, while availability is often erratic. The problem has been worsened due to the increasing competition between human and livestock for these protein ingredients as food. According to Odunsi (2003) the rapid growth of human and livestock population, which is creating increased needs for food and feed in developing countries, demand that alternative feed resources must be identified and evaluated.

The recommended policy is to identify and use locally available feed

resources to formulate diets that are as balanced as possible (Gueye and Branckaert, 2002). There is therefore need to explore the use of non-conventional food sources that have the capacity to yield the same output as conventional feeds, and perhaps at cheaper cost. Hence, any similar high protein ingredient which could partially or completely be used as suitable as soya bean meal is desirable.

One possible source of cheap protein has been the leaf meal of some tropical legume browse plants. Recently, there has been interest in the utilization of *Moringa* (*Moringa oleifera*) as a protein source for livestock (Sarwatt *et al.*, 2002). *Moringa* leaves have quality attributes that make them potential replacement for soya bean in non-ruminant diets of which rabbit is one of them. Sarwatt *et al.*, (2002) reported that *Moringa* foliages are potential inexpensive protein source for livestock feeding. The advantages of using *Moringa* for a protein resource are

numerous, and include the fact that it is a perennial plant that can be harvested several times in one growing season and also has potential to reduce feed cost. *Moringa oleifera* is in the group of high yielding nutritious browse plants with every part having food value (Duke, 1998).

## MATERIALS AND METHODS

### Experimental animals:

Thirty-six rabbits of 40 days old and approximately 480g were used. The rabbits were kept in wood cages for one week to acclimatize before commencement of the experiment. Four rabbits were randomly assigned to each cage that represents different experimental design.

### Experimental treatment:

The rabbits were divided into three groups; T1, T2 and T3. T1 received millet mash residue 98%, soya bean meal 0%, *Moringa* leaf meal 0%, calcium phosphate 1%, vitamin-mineral premix 0.5% and salt 0.5%, serving as the control group. T2 received millet mash residue 78%, soya bean meal 20%, *Moringa* leaf meal 0%, calcium phosphate 1%, vitamin-mineral premix 0.5% and salt 0.5%. T3 received millet mash residue 78%, Soya bean meal (SBM) 0%, *Moringa* leaf meal 20%, calcium phosphate 1%, vitamin-mineral premix 0.5% and salt 0.5%. The experiment was replicated three times.

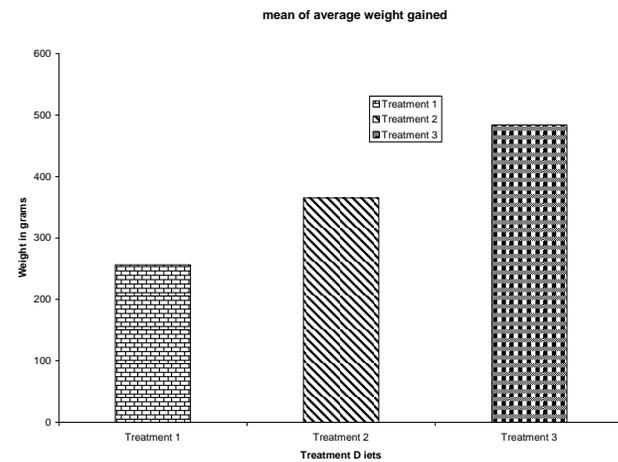
### Data collection and analysis:

The initial weights of the experimental animals were taken before the commencement of the experiment, with the administration of the treatment starting one week after. The body weights were taken weekly for six weeks. The weights were determined using electronic sensitive weighing balance.

The results were subjected to analysis of variance, the specific differences in treatment means were determined using Least Significant Difference (LSD), (Steel and Torrie, 1990).

## Result:

### Figure 1:



**Fig 1: Histogram showing the means of average weight gain of the domestic rabbits**

From the analysis of the data, it was observed that there was significant difference ( $P < 0.05$ ) between rabbits fed with different treatments and control (T1). There was progressive increase in the weight gained as the week progressed.

From Fig 1, it was observed that rabbits fed with treatment three (T3) gained the highest weight, followed by rabbits fed with treatment two (T2), while rabbits fed with treatment one (T1) gained the least weight.

### Discussion:

From the above result obtained, it was observed that the weight gain by the rabbits was recorded highest in the ones fed with *Moringa oleifera* leaf meal diet (T3) having average weight gain of 483.75g, followed by the rabbits fed with treatment two T2 having average weight gain of 365g. The least weight gain was obtained for the rabbits fed with treatment one (T1) (control) which had 256.25g. The mean weight gain was significantly difference ( $P < 0.05$ ) among all the treatment groups. The difference in weight gain between treatment two and treatment three was similar to the finding of Bamikole *et al* (2005) who reported an increase in daily weights gain after feeding

rabbits with mulberry leaves based diets. The low weight gain in the control diet might be as a result of poor quality of the diet, protein deficiency as observed from the result.

Although, the crude protein content in soya bean meal diet is higher than that of Moringa leaf meal diet, the better performance of rabbits under Moringa leaf meal diet may therefore, be partly due to a better protein quality as a result of a higher methionine and lysine supply (Booth and Wickens, 1988). According to McDonald *et al* (1988) protein in soya bean meal contains all essential amino acids but the concentration of methionine and cysteine are sub-optimal, and that methionine is the first limiting amino acid and may be particularly important in high energy diets.

#### Conclusion:

Rabbits fed with Treatment three performed better than rabbits fed with Treatment one and Treatment two in terms of average weight gain. High weight gain observed in treatment three could be attributed to good quality protein of the diet. From the result, it is suggested that; *Moringa oleifera* leaf meal could be used to improve the weight gain of domestic rabbits (*Oryctolagus cuniculus*). *Moringa oleifera* leaf meal is non-toxic to rabbits at the 20% level of inclusion and finally Moringa leaf meal could be used to replace soya bean meal completely in rabbits' diets as a non-conventional protein source.

#### References

- Bamikole, M. A., Ikhatua, M. I., Ikhatua, U.J. and Ezenwa, I. V. (2005). Nutritive value of mulberry (*Morus spp*) leaves in growing rabbits in Nigeria. *Pakistan Journal of Nutrition*, 4(4): 231 – 236.
- Booth, F. E. M. and Wickens, G. E. (1988). *Non-timber uses of selected arid zone trees and shrubs in Africa*.
- FAO Conservation Guide, Rome, pp. 92 – 101.
- Duke, A.J. (1998). Moringaleae. Handbook of energy crops. Available: [Http://www/hort.purdue.edu/newcrop/duke- energy/moringa.htm](http://www/hort.purdue.edu/newcrop/duke-energy/moringa.htm). accessed on 04/05/2008
- Gueye, E. F. & Branckaert, R. D. S. (2002). *F. A. O's programme for support to family poultry production*. Proceedings of workshop in poultry as a tool in poverty eradication and promotion of gender equality. Animal production and Health Division, F.A.O. Rome, Italy, pp. 177-178.
- McDonald, P., Edwards, R. A. and Greenhalgh, J. F. D. (1988). *Animal Nutrition*. 4<sup>th</sup> edition John Wiley & Sons Inc., New York, U.S.A., pp. 398 – 418.
- Odunsi, A. A. (2003). Assessment of *Lablab purpureus* leaf meal as feed ingredient and yolk colour
- Sarwatt, S. V., Kapange, S. S. & Kakengi, M. M. (2002). Substituting sunflower seed cake with *Moringa oleifera* leaves as supplemental goat feed in Tanzania. *Agro-forestry systems*, 56: 241 – 247.
- Steel, R. G. D. and Torrie, J. H. (1990). *Principles and procedures of statistics*. McGraw-Hill, New York, 451 pp.