

The Effect of *Moringa Oleifera* on the Growth Performance, Packed Cell Volume (PCV) and Laying Capacity Of Young Growing Quails

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Abstract The effect of inclusion of *Moringa oleifera* leaf meal on the growth performance, PCV and egg laying capacity of young growing quails was evaluated in this study. Forty five two weeks-old young growing quails were used in the study. Three dietary treatments I, II and III were formulated with Moringa leaf meal at 0, 10 and 20 levels, respectively. Each treatment had fifteen quails. The experiment lasted for eight weeks during which the effect of *M. oleifera* on the weight, PCV and egg laying parameters were monitored as indices of performance. The results indicated that the total mean weights, PCV and number of eggs laid was highest in young growing quails fed 10 g *M. oleifera* leaf meal levels (treatment II), followed by those fed control diet (treatment I) while the lowest was those fed with 20 g *M. oleifera* (treatment III). The treatment II had 78.05±29.007g mean weight, treatment I had mean weight of 73.90±27.417g, while treatment III had the least mean weight of 68.65±22.926g. Concerning the PCV; treatment II had 31.10±5.139%, treatment I had 27.70±4.342% while treatment III had 23.20±3.105. In the case of egg laying capacity, treatment II had average of 20 eggs, treatment I had average of 10 eggs while treatment III had average number of 4 eggs. The results of the research indicated that the inclusion of *M. oleifera* is concentration dependent, moderate concentration (10g) showed a better result than the higher one (20g) in the performance of growing quail.

Keywords: quails, *Moringa oleifera*, egg, weight and PCV

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1. Introduction

Malnutrition is the major challenge in Nigeria; most of Nigerian diets are deficient in animal protein [26]. This deficiency of animal proteins in the diet of many Nigerians has gained an age long recognition. Thus, the demand for protein of animal origin in Nigeria is greater than its supply [5]. The relevance of protein in human and animal diets cannot be over emphasized. In recent times, there has been a significant short fall between the production and supply of animal protein to feed the ever increasing population, [28].

Poultry production is one of the fastest means of correcting shortage of animal protein supply and consumption in Africa. This is because of their short generation interval, high rate of reproduction and efficiency of nutrient transformation into high quality protein [4]. Quail has been found to reside in many parts of Africa, including Tanzania, Malawi, Kenya, Namibia, Madagascar and the area of the Nile River Valley extending from Kenya to Egypt. In Nigeria, farmers have ventured into quail farming as a means to diversify the poultry sub-sector and help supplement domestic chicken production. This is because of the numerous benefits derived from quails.

Quail belongs to the family Phasianidae, genus *Coturnix* *bonnaterre* and species *Coturnix coturnix japonica*. Commercial quail farming is becoming more popular and is being increasingly promoted in a number of Asian and European countries [10,20] and of recent in Africa. Quail farming as an alternative poultry enterprise is practiced in Nigeria, where it is reared for its excellent including its nutritive and economic benefits [17]. Quail meat and egg are renowned for their high quality protein, high biological value and low caloric content [3]. They are highly nutritional, containing essential minerals and vitamins. Despite their small size, the nutritional value of quail eggs is three to four times greater than chicken eggs [25]. [14] reported that quail meat is tastier than chicken and promotes body and brain development in children. Quail meat is a sweet and delicate white game meat with extremely low skin fat and low cholesterol value. It is rich in micronutrients in higher percentages of proteins, phosphorus, calcium vitamin B1, iron and potassium when compared with chicken eggs and a wide range of vitamins including the B complex, folate and vitamin E and K [15].

The advantages of quail farming includes minimum floor space, low investment, comparatively sturdy birds, early market age and sexuality, high rate of egg production and less fed requirement [10]. Besides, Quail meat and egg are tastier than chicken and has less fat

contents. It has been shown to promote body and brain development in children and nursing mothers [10,22]. Quail farming is an uncommon farming business in Nigeria. But the few people that have embraced it are not only smiling to banks, they are also enjoying both the nutritional and health values derived from consuming it [8].

Quail farming has been constrained because of scarcity and high cost of quality feeds. Poultry feeds has remained a significant challenge to the poultry industry, this is because poultry especially in the tropics has been limited by scarcity and consequent high prices of the conventional protein and energy sources. Leaf meal protein is one of the protein sources being investigated in recent times. Leaf meal proteins do not only serve as a source of protein but also provides some necessary vitamins and minerals as well as some oxycarotenoids, though its high content of fibre limits its use for mono-gastrics [19]. The leaves of *M. oleifera* are potentially inexpensive protein for livestock feeding [23], it contains 80% DM, 29.7 % CP, 22.5 % CF, 4.38 % EE, 27.8 % Ca and 0.26 % phosphorus [16].

One important index of nutritional value of feeds is the haematological analysis as there is a positive correlation between protein quality and levels of haematological variables of the blood [2]. The effects of several plant proteins on the haematological parameters of poultry species have been investigated [24]. According to [6] an evaluation of blood chemistry status with nutrient intake might show the need for change or modification of certain nutrients. This research therefore aims at studying the effect of *M. oleifera* leaves on the growth performance and packed cell volume as a measure of both nutritional and medicinal benefits of the leaves in quail birds.

2. Materials and Methods

2.1. Procurement of Experimental Animal

A total of 45 quail birds at two weeks old were used for the experiment. The birds were randomly selected into three (3) treatment groups of five birds each (one male to four females). The stocking density is five birds per meter

square. Each group was replicated three times. They were all fed with guinea chick mash. The animals were maintained under standard laboratory condition, that is, a well aerated room with alternating, light and dark cycle of 12 hours each. They were allowed to acclimatize with the environment for one week before the commencement of the experiment. That is before draining blood from the animal for PCV and using weighing balance to check the weight and picking eggs laid for egg laying capacity.

2.2. Experimental Treatments

The quail birds used for the experiment were randomly assigned to three dietary treatments I, II and III formulated with ground *Moringa* leaf at 0g, 10g and 20g levels respectively and these were mixed with 500g of chick mash each. The experimental quails were housed in cages made up of wood and wire mesh, water was supplied *ad libitum*. The experiment lasted for eight weeks.

2.3. Data Analysis

The weight of the quail birds was taken weekly using a sensitive weighing balance. The PCV was determined using microhaematocrit centrifuge. The laying capacity of the birds was measured by the number of eggs laid by each bird in each cage, this was recorded daily. The result of the experiment was analyzed using Analysis of variance (ANOVA). The comparison of mean was separated using a post Hoc test (Least Significant Difference), [27].

3. Results

From Figure 1, it was observed that quail birds fed with treatment II had the highest mean weight (78.05g), followed by quail birds fed with treatment I (73.90g) and the lowest was the one fed with treatment III (68.65g).

Figure 2 showed that the quail birds fed with treatment II had the highest PCV (31.10%), followed by quail birds fed with treatment I (27.70%), while the ones fed with treatment III had the lowest PCV (23.20%).

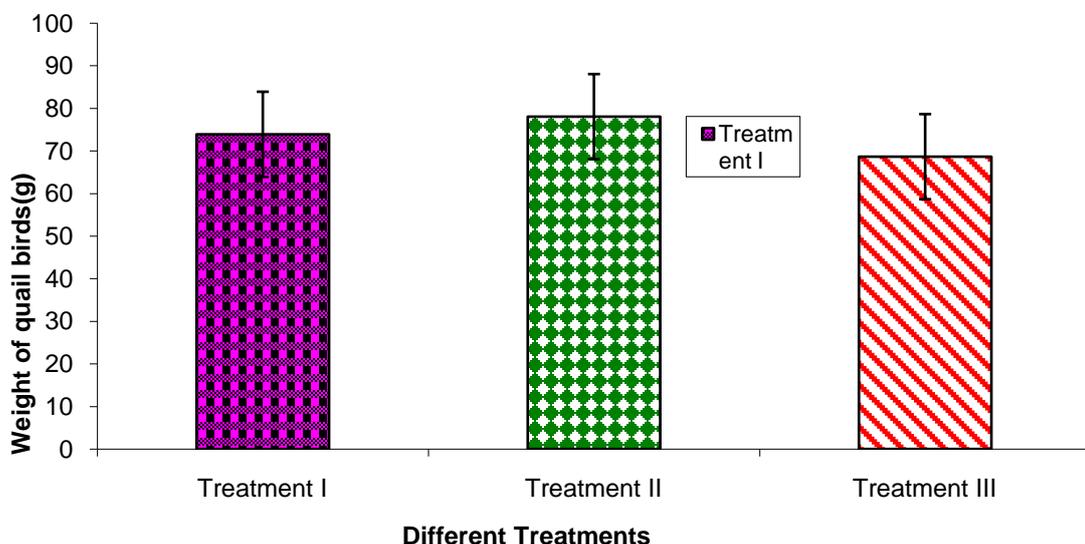


Figure 1. Mean Weight of quail birds fed with different treatments

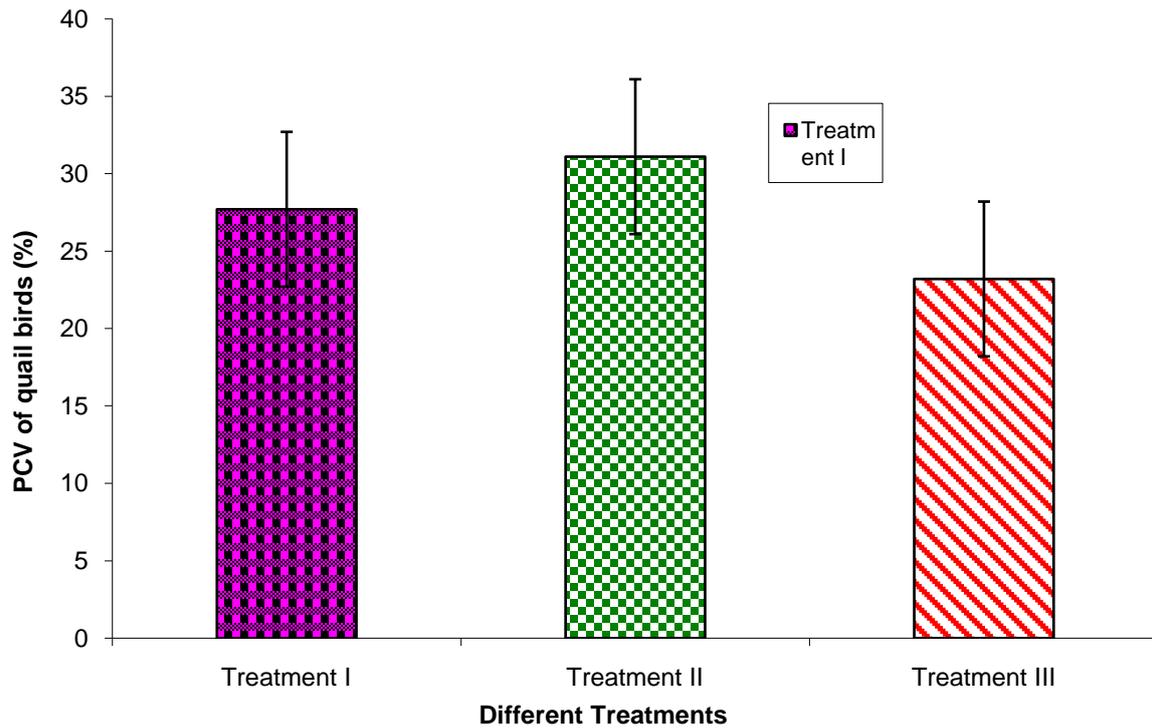


Figure 2. Mean Packed Cell Volume(PCV) of quail birds

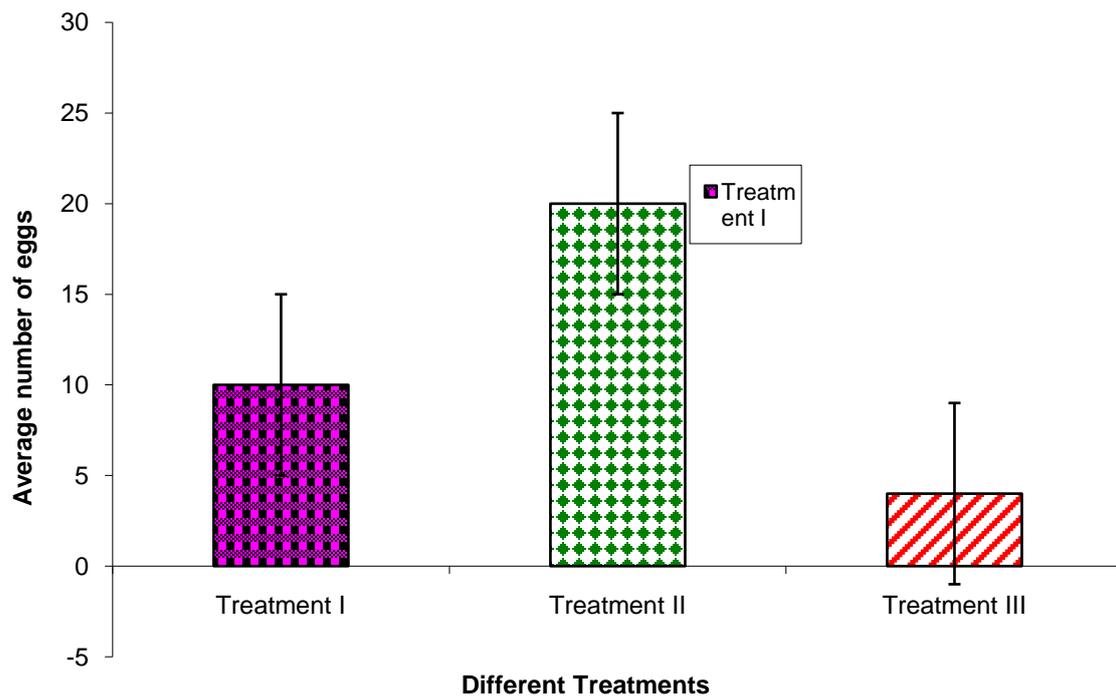


Figure 3. Mean egg laying capacity of quail birds

Considering the egg laying capacity of the quail birds, the average eggs laid was seen in Figure 3 which indicated that quail birds fed with treatment II had the highest number of eggs (20), followed by those in treatment I (10), while those fed with treatment III had the lowest (4).

4. Discussion

The inclusion of 10g of *M. oleifera* meal in diet of young growing quails significantly ($P < 0.05$) enhanced the

weight gain as compared to control group. The improved weight gain of quails fed on *M. oleifera* meal diets could be attributed to higher protein content of the diets which were efficiently metabolized for growth. This result supports the findings of [16] that fed *M. oleifera* to ruminant and observed enhanced growth performance in them. Again, [7] stated that the inclusion of *M. oleifera* leaf meal in the diet of the broilers significantly ($P < 0.05$) enhanced their weight gain. The quails fed on the diet that contained 10g of Moringa showed significantly ($P < 0.05$) higher weight gain compared to those fed on the diet that

contained 20g of *M. oleifera* meal. This result may be attributed to higher crude fibre content in the diet with 20g of *M. Oleifera* which may impair nutrient digestion and absorption [1,19]. The lower weight gain of birds fed on 20g *M. oleifera* diet despite its higher crude protein content could also be due to the negative effect of the anti-nutritional factors present in *Moringa* leaf meal on the quails. Similar reports were observed by [21] in study on the performance of broiler chicks. *M. oleifera* contains 1-23g of tannin in every 1 kilogram of leaves [16]. Tannin has been reported to interfere with the biological utilization of protein and to a less extent available carbohydrate and lipids [9]. The rich content of nutrients [16,23] and antimicrobial properties of *Moringa* [11] may be responsible for these findings. *Moringa* was also reported to have a natural enzyme which aid digestion of fibrous food in animals [13].

In addition, the results of this study revealed that quails fed 10g *Moringa* inclusion based diet have higher packed cell volume than the other treatments. This higher value of the packed cell volume may be attributed to the nutritional content of treatment diet [12]. Although *Moringa* based diet enhanced growth performance of the quail birds, it is worthy to note that the quails fed with 20g of *Moringa* meal had the lowest weight gain (95.00g) and Packed Cell Volume (21.40%). This shows that if the *Moringa* meal is excess, the feed will not be palatable for the quails to feed on. Therefore the inclusion of *Moringa* meal should be in moderate amount so as to make the feed palatable to the quails and also enhance their growth rate. Quail birds fed 10g *Moringa* inclusion diet laid the highest number of eggs during the study period. This suggests that this treatment improved their reproductive potential. This corroborates with [18] reported that inclusion of graded level of *Moringa oleifera* meal up to 10% does not have any deleterious effect on the performance of young pullets.

5. Conclusion and Recommendation

From the current results, the inclusion of *Moringa oleifera* leaf meal up to 10 g in the diet of young growing quails enhanced their growth performance, Packed Cell Volume and their egg laying capacity. Therefore, 10 g of *Moringa oleifera* is recommended for the rearing of quail birds.

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