**A**

**RESEARCH PROPOSAL**

**ON THE TOPIC:**

**THE INFLUENCE OF SELECTED TROPICAL FORAGES AND TIGERNUT BASED-DIET ON THE GROWTH PERFORMANCE OF WEANER GROWERS RABBITS**

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**INTRODUCTION**

**Background of the Study**

Rabbit (*Oryctolagus cuniculus*) is one of the most productive animals among other domesticated livestock, their feeding habit is in no competition with humans and their optimum performance can only be ensured in a mixed feeding regime involving forage and formulated feeds without compromising their reproductive efficiency (Arijeniwa, et al., 2000). Rabbit is identified as an economic livestock for small scale rural farmers or dwellers. According to Abdulmalik (1994) rabbit is capable of producing about 4.7kg of meat, enough to solely meet with animal protein requirement of a medium family size. Rabbit production also has enormous potential in alleviating the problems of animal protein supply in a developing economy (Biobaku and Dosumu, 2003). The most advantageous attributes of the rabbit is that it has high reproductive potential and fast growth rate (Ojewola et al., 2006). This is due to its short period length, early maturity, high prolificacy and ability to rebreed shortly after parturition (Odubote and Akinokun, 1991). Fast-growing animals such as rabbits possess a number of features that might be of advantage to the small holder subsistence – type integrated farming especially in developing countries. The potentials and attributes of rabbit which makes it unique among farm animals include, high growth rate, high efficiency of conversion, short gestation period, and high prolificacy, low cost of production, high quality (meat which includes low fat, sodium, and cholesterol levels). Rabbit meat has a high protein level (about 20.8%) and its consumption is bereft of cultural and religious biases (Biobaku and Oguntona, 1997). Omole et al., (2005) reported that the white meat of rabbit is nutritious, easily digestible and extremely low in cholesterol and sodium levels. Damron (2006) showed that cooked piece of rabbit meat is high in protein (56%), low in fat (9%), low in cholesterol, sodium and calories (8%) and contains 28% phosphorus, 13% iron, 16% zinc, 14% riboflavin, 6% thiamin, 35% B12 and 48% niacin. There is a direct relationship between nutrition and the outstanding reproductive qualities of the rabbit as observed by Egbunike and Ladokun (1998). Herbert et al., (2005) reported that nutrition affects the secretory functions of the accessory sex gland, that is, the products that make up the seminal plasma. Nutrition plays a vital role in enhancing the reproducing capacity of an animal and the overall increase of animal products such as meat, milk and egg. Tiger nut, which is also known as the “underground walnut”, grows all over the world because of its high yield and broad prospects for comprehensive utilization. The tiger nut is the tiny tuber of Cyperus esculentus L., which can be roasted and used to be sweetmeat in Egypt Moreover, it is an important representative crop of the Spanish Mediterranean region, with an annual production of 9000 metric tons (Sánchez-Zapata, et al., 2012). Tiger nut is a valuable source for diverse nutrients, such as oil, starch, fiber, protein, phenolic compounds and other source of nutrients. They are rich in minerals such as phophorus, potassium, calcium, magnesium and iron (Maduka and Ire, 2018). Increasing demand and subsequent high cost of conventional animal feed ingredients coupled with increase in human population has created the need for sustainable alternatives, particularly natural feed resources (Onwuka et al., 1989; Abubakar and Mohamed, 1992; Osagie, 1998; Tian et al., 1998). Forage legume feeding has been advocated and is being adopted by small to medium scale livestock farmers in the tropics to boost nutritional and growth performance of their animals (Preston and Leng, 1989; Herbert et al., 2005). The use of forages and other agricultural by-products such as Tridax precumbens (Taiwo et al., 2005) Moringa (Moringa oleifera) (Odeyinka et al., 2008), Acacia (Acasia nilotica) (Abdu et al., 2011), composite cassava meal (Ukachukwu et al., 2011), and Commelina benghalensis, Leucerna leucocephala, Boerhavia diffusa, Impomia triloba (Yakubu et al., 2012) have been reported and recommended as feed supplements to livestock. Ayoade et al., (1985) observed that rabbit can thrive and survive on a wide range of fresh or preserved grasses, shrubs and leaves that are not consumed by humans. Evers (2000) reported that leguminous forages such as, Tridax precumbens, Moringa oleifera and Leucerna leucocephala are high in protein and crude fibre. They have high digestibility, contain five times the calcium, 30% to 50% phosphorus and twice the magnesium of grasses. Calapogonium.mucunoides is a creeping and twinning, hairy forming, trifoliate and prostrate that is drought resistant and relatively palatable (Olorode, 1984). According to Olubanjo, (1977) Panicum maximum is palatable and nutritious during the early stage of growth in rabbits. The National Research Council of Nigeria (1994) reported that rabbits utilize green feeds efficiently and that under ideal conditions can grow so rapidly that their rate of gain is only slightly lower than that of broiler chickens. Cheeke (1984) reported that rabbits fed on a mixture of forages perform better because such a mixture is normally able to supply the requirements of proteins, minerals, vitamins and energy. Pote et al. (1981) observed that supplementation with greens reduced the amount of pelleted feed to about 50% without adversely affecting growth. The purpose of this study will be to evaluate the effect of three forages, Tridax precumbens, Moringa oleifera and Leucerna leucocephala On the growth performance of weaner rabbit's production.

**Problem Statement**

According to Spore (2007) and Soyebo (2006), rabbit production has the potential to improve on the diet and income of many poor households due to its high growth and fecundity rate, low investment and labour cost. It is also observed that rabbit can thrive and survive on a wide range of fresh or preserved grasses, shrubs and leaves that are not consumed by humans. High cost of conventional feedstuffs is one of the major limiting factor to large scale commercial rabbit production in Nigeria and there are mostly published research information on the growth performance of Rabbits on commercial feeds but seemingly little information on the evaluation on the growth performance of rabbits fed with some common forages. It is for this reason that: necessitates the feeding of weaners rabbits with three selected forages and tiger nut based diet on growth parameters.

**Justification of the Study**

Presently, more farmers are involved in rabbit production but they are encountered with high cost of feeding and poor growth performance as such, it has become imperative to develop appropriate and cost effective feeding systems for rabbit farmers. several authors have suggested that, the scarcity of animal proteins and high cost of the conventional feedstuffs in our countries can be ascertained by incorporating or supplementing forages in the diets of rabbits (Bawa *et al.,* 2008; Yakubu and Wafar, 2014). Forages offer a considerable potential as a major source of energy, proteins, minerals, and vitamins for herbivorous animals (Crowder, R. and Chadha, 1999). Studies showed that rabbit is capable of producing about 4.7kg of meat, enough to solely meet with animal protein requirement of a medium family size which can also increase the growth performance of the animal. The use of forages and other agricultural by-products such as Tridax precumbens (Taiwo et al., 2005) Moringa (Moringa oleifera) (Odeyinka et al., 2008), Acacia (Acasia nilotica) (Abdu et al., 2011), composite cassava meal (Ukachukwu et al., 2011), and Commelina benghalensis, Leucerna leucocephala, Boerhavia diffusa, Impomia triloba (Yakubu et al., 2012) have been reported and recommended as feed supplements to livestock especially rabbits to boost their growth performance. The growth parameters of animal provide the opportunity to analyze its physiological, nutritional and pathological status. The result of this research work will determined the differences in growth performance and the economic importance of these selected forages, Moringa oleifera, Leucerna leucocephala and Tridax precumbens in rabbit production hence, broaden knowledge benefiting Animal feed industries and farmers in the long-run on comparative utilization of these forages (Moringa oleifera, Leucerna leucocephala and Tridax precumbens).

**Objectives of the Study**

The objective of this study is specifically to;

* evaluate the effect of Moringa oleifera, Leucerna leucocephala, Tridax precumbens and tiger nut-based diet on the growth parameters of weaner grower Rabbits.

**METHODOLOGY**

**Experimental site**

This experiment will be conducted in the Rabbitry Research unit and Animal Science laboratory of the Department of Animal Science, Akwa Ibom State University, Obio Akpa Campus, Oruk Anam Local Government Area, Akwa Ibom State respectively. It lies between latitude 4030’N and 50 00’N and longitudes 700 30’E and 800 00’E. The climate of the experimental site is a tropical rain forest characterized with high temperature (average of 300C), high rainfall (about 1500mm) and relative humidity of 70% on average

**Experimental Materials**

The rabbits and the tiger nuts for the experiment will be purchased from the market around Oruk Anam and Abak area. The forages Moringa oleifera, Leucerna leucocephala and Tridax precumbens will be sourced around the experimental site and the botanical identity will be confirmed.

**Experimental animals and management**

sixteen weaner Rabbits with average weight 350 – 550g will be used and will be obtained from local farmers and Rabbitry Unit of Akwa Ibom State University, Obio Akpa. These rabbits will be managed intensively, kept in hutches, the hutches will be washed and disinfected before the animals are introduced. They will be provided with water and a tiger nut based concentrate diet. The animals will also be kept under controlled conditions, relative humidity and the 12-hours light-dark cycle will also maintain. They will stay in the cage for up to 10 days to acclimatize.

**Experimental design**

Completely randomized design will be used for the experiment. The animals will be assigned to four dietary treatments. Each treatment will be replicated five times with a rabbit per replicate in completely randomized designed. The rabbits ‘T2, T3 and T4’ will be assigned one of the three forages; Tridax procumbens, Panicum maximum and Pennisetum purpureum respectively while T1 will serve as the control group which will be maintained on only the concentrate feed. The feeding will be done on the test groups twice daily for 8 weeks (2 months). Their body weight changes will be measured before and after treatment.

**Formulation of Experimental Diet**

The concentrate, tiger nut based diet will be formulated and feed as complete diet and the three selected forages; Moringa oleifera, Leucerna leucocephala and Tridax precumbens will be served at 0, 2.5, 5, and 7.5% inclusion levels. The diets will be designated as diet 1, 2, 3, and 4 respectively, in the experiment. Feeding will be done at 5% body weight of the animals such that the rabbits will be fed the forage at 2.5% body weight and concentrate basal diet at 2.5% body weight. The feeding will be done on the test groups twice daily for 8weeks (2 months). Their body weight changes will be measured before and after the experimental phase.

**Table1 Gross composition of the experimental diets (%)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Treatments** | | | |
| **Ingredients** | **1** | **2** | **3** | **4** |
| **Tigernut residues** | **0.00** | **2.0** | **4.0** | **6.0** |
| **Maize** | **37.6** | **37.4** | **36.2** | **36.1** |
| **Cow pea hay** | **25.0** | **24.5** | **27.5** | **25.0** |
| Soy bean meal | 1.3 | 1.3 | 1.3 | 1.3 |
| **White PKC** | **10.1** | **9.5** | **9.5** | **9.5** |
| **Bone meal** | **12.1** | **11.4** | **6.5** | **6.4** |
| **Salt** | **0.5** | **0.5** | **0.5** | **0.5** |
| **Lysine** | **0.20** |  |  |  |
| **Starter Premix** | **0.25** | **0.23** | **0.22** | **0.22** |
| **Methionine** | **0.10** | **0.21** | **0.10** | **0.12** |
| **Total** | **100** | **100** | **100** | **100** |

**Nutritional composition**

|  |  |
| --- | --- |
| **Nutrients** | **Composition** |
| **Crude protein** | **19%** |
| **Ash** | **10%** |
| **Gross energy** | **2800kcal/kg** |
| **Crude fibre** | **6%** |
| **calcium** | **0.95%** |
| **phosphorus** | **0.65%** |
| **Crude fat** | **8%** |

**Growth performance**

The rabbits will be weighed individually prior to the commencement of the experiment and subsequently on weekly basis for proper observation for the weight gain, growth performance of the animal in each treatment. The average daily weight gain and feed intake will be calculated and recorded at the end of the week. Higher weight gain will be reported across the treatments and will show a better acceptability of the diets which are the forages.

**Data Collection**

All the animals will the measured and analyzed using weighing balance

**Data Analysis**

All the data obtain will be expressed as mean ± standard error and analyzed using One Way Analysis of Variance (ANOVA). Significant means will be separated by applying Duncan multiple range as outlined by Duncan (1955).

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