**A**

**RESEARCH PROPOSAL**

**ON THE TOPIC:**

**EFFECT OF FENUREEK *(Trigonella foenumgraecum)* MEALON GROWTH PERFORMANCE, CARCASS CHARACTERISTICS AND INTERNAL ORGANS OF FINISHER BROILERS CHICKENS**

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**CHAPTER ONE**

**INTRODUCTION**

* 1. **Background of the Study**

Feed is a crucial component that influences the net return of the poultry business. In the broiler industry, feed costs are considered to be one of the greatest challenges, mainly in developing countries (Thirumalaisamy *et al.,* 2016). Antibiotic growth promoters are the antibiotics that are used in poultry feed continuously at a lower level to improve growth and feed conversion and not for the purpose of any therapeutic reasons (Dhama *et al.,* 2014, Hassan *et al.,* 2010). Antibiotic Compounds commonly used as growth promoters include; Bacitracin, Penicillin, Virginiamycin, Flavomycin, Chlortetracycline, Oxytetracycline, Colistin Sulphate, Enrofloxacin, Tramulin, Neocycin, Doxycycline, Erythromycin and Aureomycin (Chowdhury *et al.,* 2009). Antibiotics are given at sub therapeutic dosage for stabilization of the microflora of intestine; for improving overall growth performance and prevention of colonization of the gut with pathogenic strains of microbes (Dibner and Richards, 2005; Hassan *et al.,* 2010). Antibiotic growth promoters have inhibitory effect on enzymes released by micro-organisms and also on enzymes involved in microbial metabolism (Dhama *et al.,* 2014). It also reduces the growth-depressing metabolites produced by micro-organisms. Despite the significant increase in poultry production due to the use of antibiotic growth promoter, the World Health Organization (WHO) along with block organization for Animal Health (WOAH) have encourage the health, agriculture veterinary sector to reduce the injudicious use of antibiotics as growth promoter in animal nutrition and production (Aidara-Kane, 2012). This is due to health threat of antibiotic use as growth promoter. The use of antibiotics through feed or drinking water when the birds are not infected can be dis advantageous, in certain aspects. However, it can lead to the development of antibiotic resistant strains of pathogenic micro-organisms including staphylococcus aureus and streptococcus spp. of bacteria in the gut of birds (Kocher, 2006; Nieworld, 2007). Devirgilis *et al.* (2013) in his review concluded that the continued use of antibiotics as routine feed additives may also contribute to the increased presence antibiotic residues in poultry products (Dhama *et al.,* 2014). Certain antibiotics even as residues can cause allergic hypersensitive reactions in consumers (Niewold, 2007). The continuous application of antibiotics can suppress sensitive natured microflora in the gut like: Saprophytes, commensals, non-pathogenic bacteria, fungi and yeasts or can show a compensatory growth and few can even increase their virulence (Huyghebaert *et al.,* 2011; Devirgilis *et al.,* 2013). Due to the above mentioned disadvantages, its continued use as a growth promoter has been restricted or even banned some countries and the use of alternative growth promoters such as prebiotics and probiotics, enzymes, phytobiotics, are being encouraged (Niewold, 2007; Kocher, 2006). Novel and beneficial feed additives including different dietary fibers with adequate amount promotes the growth performances and maintain poultry immune and gut health (Alloui *et al.,* 2012; Elagib *et al.,* 2010). Fenugreek is a popular medicinal plant grown in nature and are hypoglycemic, antibacterial, anti-inflammatory, antipyretic and antimicrobial. This includes neurin, biotin, trimethylamine, and its effect on the nervous system appears to promote appetite (Alloui *et al.,* 2012). It contains dietary proteins, carbohydrate, minerals and vitamins which are known to be a healthy source for humans as well as livestock (Duru *et al.,* 2010). Fenugreek is an excellent source of minerals like iron, copper, selenium, zinc, calcium, potassium, magnesium and manganese and also an excellent source of many vital vitamins like thiamine, pyridoxine, riboflavin, vitamin A and C, (Duru *et al.,* 2010). This research is therefore planned to forecast the impact of supplementation with Fenugreek on growth efficiency and carcass characteristics of finisher broiler diets.

* 1. **Problem Statement**

Feed is a crucial component that influences the net return of the poultry business. In the broiler industry, feed costs are considered to be one of the greatest challenges, mainly in developing countries. It comprises around 60-80% of the total expense of poultry meat production (Thirumalaisamy *et al.,* 2016). The expansion of the poultry production depends to a large degree on the availability of sufficient and cost-effective high-quality feed to both farmers and consumers (Ravindran, 2013). Additionally, the use of antibiotic growth promoters consequently has harmful residual effects on consumers involving transmission of antibiotic resistant bacteria and transfer of zoonotic infections are issues of concern discouraging its use in poultry production. Hence, the need to explore alternatives to promote meat consumption safety and promote poultry production invariably.

* 1. **Justification of the Study**

The use of antibiotics was popular to mitigate the effect of high feed cost but the use of antibiotic as growth promoters in animal nutrition has been banned due to their adverse effects on both animal and human health due to drug resistance and modification of microbiota of humans. So, there has been an increasing trend towards using natural feed additives to improve the performance, increase the dietary protein, energy utilization and to maintain health of birds. Herbs and plant extracts are good alternatives to antibiotics. Fenugreek are considered as an appetizer and helps in digestion; improve growth performance and health. Hence, comparatively suitable for this study.

**1.4 Objectives of the Study**

The objective of this study will be to;

* evaluate the growth performance of broiler chickens fed diets containing varying levels of fenureek *(trigonella foenumgraecum)* meal.
* evaluate the carcass characteristics and internal organ of broiler chickens fed diets containing varying levels of fenureek *(trigonella foenumgraecum)* meal.

**CHAPTER THREE**

**MATERIALS AND METHODS**

**3.1 Experimental Site**

The experiment will be conducted at the poultry Research unit of the Department of Animal Science, Akwa Ibom State University, Obio Akpa Campus, Oruk Anam Local Government Area, Akwa Ibom State. The area 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 (SLUS-AK, 1989).

**3.2 Experimental materials sourcing and processing**

Fenugreek seeds will be purchased from the commercial local markets of Abak which will be incorporated in the diets of broiler chickens. Fenugreek seeds will be washed with tap water and then sun dried. Then the dried Fenugreek will be ground into powder stored in sealed polyethene bags, and kept at room temperature until used in commercial diet.

**3.3 Purchase and Management of Experimental Birds**

A total of one hundred and twenty (120) day-old broiler chicks will be used for the experiment. The chicks will be purchased from a hatchery agent in Abak Local Government Area, Akwa Ibom State. The brooding of the birds at the first two weeks will be done at a temperature of 32-35oC to enable feather development by providing adequate heat source. The birds will be managed intensively using deep litter system. Wood shavings will be used as litter material. Feed and water will be provided ad-libitum. The chicks will be vaccinated against the most common diseases such as; Newcastle Disease and Infectious Bursal Disease (Gomboro). They will be acclimatized for one (1) week before the commencement of the experiment.

**3.4 Proximate Composition of the Test Ingredient**

Proximate analysis of the fenugreek meal will be carried out at the biochemistry laboratory of the Akwa Ibom State University by method of AOAC (1992) to determine the moisture, crude protein, crude fibre, ash, nitrogen free extract and ether extract content of the residue.

**3.4.1 Moisture Content**

The container will be washed, oven dried and then transferred into a desiccator for cooling before weighing. 2g of the sample will be weighed and put into the container and dried in the oven at a temperature of 1050c for 5-6 hours and then removed and reweighed. After weighing, it will be put back into the oven for further drying. This process will be repeated until there is no more loss in weight.

**3.4.2 Ash Content**

The residue remaining after the destruction of the organic matter of a feedstuff is refer as ash. 2-4g of the Sample will be weighed and introduced into a silica dish that had previously been heated and cooled. The dish will be placed on a cool muffle furnace whose temperature will be increased to 450OC and maintained until a whitish gray ash remains. The dish will be removed from the furnace and placed in the desiccator. It will be allowed to cool after weighing.

**3.4.3 Nitrogen Free Extract (NFE)**

The calculation for nitrogen free extract is: %NFE = 100% - (%EE + %CP + %Ash + %CF). As nitrogen free extract vis calculated by difference, all the errors associated with the proximate analysis are additive in the estimate of nitrogen free extract

**3.4.4 Crude Protein**

In the kjeldahl procedure, after digestion in the concentrated sulphuric acid, the total organic nitrogen is converted to ammonium sulfate. Ammonia is formed and distilled into beric acid solution under alkaline conditions. The horate ions formed are titrated with standardized hydrochloric acid by which is calculated the content of nitrogen representing the amount of crude protein in the sample. Most proteins contain 16% of nitrogen, thus the conversion factor is 6.25. however, the nitrogen from non-protein additives of contaminants in the food such as melamine in milk is also measured.

**3.5 Experimental Design**

On day fourteen (14), the birds will be weighed to obtain their initial weights and divided into four (4) treatment groups. Each treatment group will further be replicated thrice and each replicate having about (10) birds each. Each group will be supplied one of the four experimental starter diets for twenty-one (21) days and experimental broiler finisher diet will be supplied from day 22 to day 42. Completely randomized design (CRD) will be employed for this experiment. The experimental model of Completely randomized design (CRD) is as follows;

Xij = μ + T1 + ∑ij

Where;

Xij = any observation or measurement

μ = Population mean

T1 = Treatment Effect

∑ij = Experimental Error

i = Number of treatments

j = Number of replicates

**3.5 Data Collection**

**3.5.1. Growth Performance**

The weekly weight of each bird will be collected and recorded using a digital weighing scale. The amount of feed and water consumed (feed intake) will be obtained by subtracting the weight of the amount of feed left over in each replicated group from the total amount of feed given. This will be done thrice a day at 8am, 12pm and 5pm. Feed conversion ratio will also be determined by dividing the total feed intake by body weight gain. Body weight gain will be determined by subtracting the initial body weight from the final body weight of the birds.

**3.5.2 Evaluation of carcass characteristics:**

Prior to slaughtering, the birds will be selected and restricted to feed overnight, but water will be provided *ad libitum*. The birds will be randomly selected in each replication for slaughtering. The live weight of birds will be taken individually before slaughtering. At the time of slaughtering, the birds will be secured by holding both shanks with one hand and both wings with other hand by the help of an assistant to prevent struggling. Slaughtering will be done manually using a sharp knife. After complete bleeding shank, head, and skin will be removed. Finally, evisceration will be done manually to separate liver, heart, gizzard, meat yield and weighed. The dressing percentage is the relationship between the weight of the dressed carcass and the weight of live birds after removal of things such as the hide and internal organs. The percentage of dressing will be determined by taking the carcass weight divided by the weight of live birds.

Dressing percentage (%) = (Weight of the carcass (g) / Weight of live bird (g)) x 100.

**3.7 Data Analysis**

All data collected will be subjected to Analysis of Variance (ANOVA) procedure of Statistical Package for Social Sciences (SPSS 2007). Significant differences will be separated using Duncan’s Multiple Range test (Duncan 1955).

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