FACULTY OF AGRICULTURE AND ANIMAL SCIENCES

DEPARTMENT OF ANIMAL PRODUCTION

FINAL YEAR PROJECT REPORT

EVALUATING CURCUMIN AS A POTENTIAL FEED ADDITIVE IN BROILER PRODUCTION

BY

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This Final Year Project Report is submitted to the Department of Animal Production and Management in partial fulfilment of the requirement for the award of the Degree of Bachelor of Science in Animal Production and Management of Busitema University

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ABSTRACT

Antibiotic resistance is a major global threat that jeopardises the effectiveness of antimicrobial agents in treating infectious diseases. One of the main drivers of antibiotic resistance is the excessive and inappropriate use of antibiotics in animal production, especially in broiler chicken, which are among the highest consumed animal products worldwide. Antibiotics are used in broiler production for various purposes such as prevention, treatment and growth promotion. However, this practice has led to emergence and dissemination of resistant bacteria in poultry settings, posing risks to animal and human health, as well as food safety and quality. Therefore, there is an urgent need to find alternatives to antibiotics in broiler production that can maintain or improve the growth performance and gut health of broilers without compromising the efficacy of antibiotics and safety of poultry products. Curcumin, a natural compound, derived from turmeric, has been shown to have beneficial effects on animal health, such as anti-inflammatory, anti-microbial and immunomodulatory properties. However, its potential as a substitute to antibiotics in broiler production has not been extensively explored. This study aimed to evaluate the effect of curcumin on the growth performance and feed intake of broilers as compared to antibiotics. Two groups of broilers (n=25) each were randomly assigned to receive either curcumin or antibiotics in their feed for four weeks. The weight and feed intake of the broilers were measured weekly over a period of four weeks. The data was analysed using ANOVA. The results showed that there was no significant difference in weight gain or feed intake between the two groups ($p>0.05$). Curcumin had no significant effect on the growth and feed intake of broilers. However, curcumin may have other benefits that were not measured in this study such as improving gut health, enhancing immune system, reducing inflammation and preventing bacterial infections. These benefits may improve the overall health and welfare of the broilers, as well as the quality and safety of the meat. Therefore, curcumin may be a promising alternative to antibiotics in poultry nutrition, but further research is needed to optimize its use and to assess its effects on other parameters.

DECLARATION

I **Nakiyijja** Deo Angella, declare that the work presented is this report is my own and has never been submitted to any higher institution of learning for any academic reward

Signature .....

Date 04/03/2024.....

APPROVAL

The work presented in this report was written under the guidance and supervision of

DR. HELLEN KISAKYE

Signature.....

Date 03/04/2024

DEDICATION

This work is dedicated to Mr. Kasule Vicent who has supported me in all stages as I carried out this research. It is also dedicated to my friends Victoria, Brenda and Freda

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LIST OF ABBREVIATIONS

ANOVA	Analysis of Variance
DR	Doctor
Mr.	Mister
AB	Antibiotics
ABR	Antibiotic Resistance
Prof	Professor
FCR	Feed Conversion Ratio

CHAPTER ONE: INTRODUCTION

1.1Background

Poultry farming is a highly competitive sector, as it is a source of both meat and eggs to feed the rapidly growing human population (Tuleun et al.,2022). Several additives are used in this case to improve or maintain stable production while enhancing economic viability of such projects. Antibiotics, one of the additives, have been widely used in poultry feed to prevent bacterial infections and encourage faster growth of birds especially broilers (Abou-Elkhair et al., 2014). However, the continued administration of the sub-therapeutic levels of the antibiotics has led to the emergence of antibiotic-resistant strains of bacteria, not only posing serious threat to animal health but also to the entire population that feed on products from such animals (Al-Mashhadani, 2015). Therefore, there is growing interest in finding alternatives to the antibiotics added to poultry feeds that have no serious health threat (Dono, 2014). Curcumin, an active ingredient derived from *Curcuma longa* plant, has been suggested as a potential substitute to the latter (Sinurat et al., 2009). This is attributed to its anti-bacterial, anti-inflammatory and anti-oxidant properties. In addition, due to increasing propagation of knowledge about antibiotic residues in foods of animal origin, consumers are more interested in organically-produced goods posing a threat to the market of most of the products (Laganá et al., 2019). The aim of this study is to investigate the potential of curcumin as an alternative to antibiotic growth promoters in poultry feed and its effect on poultry production.

1.2 Problem Statement

Antibiotic additives in broiler feed have been commonly used in the poultry industry to promote growth and prevent diseases (Maeda, 1958). However, the indiscriminate and excessive use of antibiotics in animal industry has led to the rise of antibiotic resistance, posing risks to human health and the environment at large (Carrique-Mas et al., 2017). There has been an increase in reports on antibiotic treatment failures in Uganda, not only in the animal population, but also in the human population (Najjuka et al., 2021). . This has been attributed to antibiotic resistant bacteria spread from animals to humans. In the poultry industry, antibiotics are often used for disease prevention and growth promotion (Wang et al., 2023). Broiler chicken, which are raised for meat, have greatly contributed to the development and spread of antibiotic-resistant bacteria.

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