BUSITEMA UNIVERSITY
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P.O.Box 236, Tororo
Gen:+256-454448842
Dir: +256-454448864
Mob: +256-782999874
Fax: +256-454436517
Email:ar@acadreg.busitema.ac.ug
Website:www.busitema.ac.ug

FACULTY OF AGRICULTURE AND ANIMAL SCIENCES

BACHELOR OF ANIMAL PRODUCTION AND MANAGEMENT

COMPARATIVE STUDY OF CRUDE NEEM LEAF POWDER WITH ALBENDAZOLE (12.5%) ON MANAGEMENT OF GASTROINTESTINAL NEMATODES IN INFECTED GOATS IN THE OKELLO GOAT FARM IN THE ARAPAI SUB-COUNTY.

BY

KIMONO FLAVIA

Reg.NO: BU/UP/2021/3583

Email: flaviakimono5@gmail.com

A RESEARCH DISSERTATION SUBMITTED TO THE DEPARTMENT OF ANIMAL PRODUCTION AND MANAGEMENT IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE BACHELOR'S DEGREE IN ANIMAL PRODUCTION AND MANAGEMENT AT BUSITEMA UNIVERSITY.

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DECLARATION

I, Kimono Flavia, hereby attest that the work in this dissertation is entirely original with no prior submissions, either in whole or in part, to any university or institution for credit toward a degree. It is also the product of my own investigation, with the exception of where it is recognized.

NAME; KIMONO FLAVIA **REG. NO. BU/UP/2021/3583**

Signature..... Date 07/NOV/2024

APPROVAL

With the academic supervisor's consent, this dissertation has been submitted for review;

Mr. Ongom Isaac

Lecturer;

Department of animal production and management

Faculty of agriculture and animal sciences

Busitema University

Date.....07|Nov|2024.....

Signature.....

DEDICATION

I would like to extend my heartfelt gratitude to my family, particularly my brother Mafumo Robert Humphrey and his lovely wife, my dear sister Nebokhe Emilly, and my wonderful mother, Annet Murenga Situma, for their unwavering love and support. I am also deeply grateful to my friends and colleagues for their dedication and encouragement throughout this journey. This work is dedicated to the Almighty Lord, whose guidance and wisdom have sustained me in compiling this report.

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ABBREVIATIONS

GIN…… Gastrointestinal nematodes

Mr. …… Mister

BZ……... Benzimidazole

AR…..... Anthelmintic resistance

Alb……... Albendazole

GI…… Gastro-intestine

AI…… Azadirachta indica

Vet……... Veterinary

ABSTRACT

Gastrointestinal nematodes (GINs) pose a significant health challenge to goats, affecting productivity and welfare in rural areas. Chemical anthelmintics like albendazole are commonly used for nematode control, but concerns about drug resistance have led to exploring natural alternatives like neem leaf powder.

This research study was carried out at Okello Goat Farm in Arapai Sub-County. The primary objective was to evaluate and compare the efficacy of crude neem leaf powder and 12.5% albendazole in managing various gastrointestinal nematodes in goats. The study considered purposively 21 infected goats divided into three groups that is Albendazole, Neem, and Control clusters. Fecal samples were collected and analyzed at the Busitema University Arapai Campus laboratory using the modified McMaster technique to quantify nematode egg counts. Fecal egg counts for each nematode species were recorded on Days 0, 7, 14, and 28. Neem leaf powder was prepared by harvesting mature neem leaves and drying them under the shade for about 10 days then grind into fine powder which was then mixed with water to make the drug.

The results obtained showed that Haemonchus was the most prevalent species, accounting for 407 instances, representing 49.7% of the total nematode population, making it the dominant parasite in the area. Trichostrongylus followed with 282 occurrences, constituting 34.4% of the total, contributing significantly to the GIN burden despite being less common than Haemonchus. Nematodirus the least common, with 130 cases, representing 15.9% of the total nematodes found. On the other hand, results showed that both albendazole and neem significantly reduced egg counts, with albendazole achieving complete elimination of eggs by Day 14. For albendazole-treated goats, egg counts for Haemonchus, Nematodirus, and Trichostrongylus were reduced to zero by Day 14 with p-values of 0.010, 0.001 and 0.001 respectively. Neem leaf powder also showed significant reductions in egg counts, although full elimination occurred later, by Day 28 (p-values ranging from 0.021 to 0.032) indicating that neem effectively reduced egg counts but with a delayed response compared to albendazole. In the control group, egg counts remained unchanged throughout the study.

In conclusion, both albendazole and neem leaf powder effectively reduce gastrointestinal nematode infections in goats, with neem serving as a sustainable alternative suitable for organic farming.

CHAPTER ONE

1.1 Background

The livestock sector not only supports a vast proportion of individuals across the globe; it also ensures food security (Sejian et al., 2021). Goats are one of the many livestock species that are important to the world livestock market. Many small-scale farmers in underdeveloped nations like Uganda keep goats as a significant source of revenue, milk, meat, and fiber, and can be utilized as a supply of manure (Modi et al., 2024**).** They are resilient creatures that can thrive in a variety of environments, and their populations vary dramatically across nations (Monau et al., 2020). Despite its significance, the small ruminant industry is frequently hampered by intestinal nematode (GIN) infections (Saddiqi et al., 2011). Intestinal nematode (GIN) infections are a major global cause of productivity losses in commercial goat farms (Nsereko et al., 2016), affecting all types of livestock (Jamil, 2023). Nematodes, the most significant type, are found worldwide and negatively impact goat populations, causing significant economic losses (A. Sharma et al., 2023). Studies in North America show that gastrointestinal parasitism has been identified as the primary factor influencing goat productivity and animal mortality (Navarre & Pugh, 2002; Pugh & Navarre, 2001). According to (R. K. Das et al., 2019), A survey done on goats in Nepal reveals that Goat gastro-parasitic diseases can reduce the amount of meat available in a nation where there is a growing demand for goat meat which is an economic loss. One of the main issues goat populations face worldwide is parasitism, which is to blame for productivity losses (Rizwan et al., 2023). In most tropical African nations, ruminants particularly goats are essential to agricultural systems (Nair et al., 2021).Gastrointestinal nematode populations in goat farms have an impact on output levels that are both qualitative and quantitative (Devadharshini et al., 2022). Economically speaking, it is well known that gastrointestinal nematodes are a major contributor to health issues in ruminant animals and causes significant losses in the livestock sector because of decreased productivity. Intestinal parasites cause growth retardation in young goats, which lowers the carcass weights at slaughter (Arsenopoulos et al., 2021). Some parts of Rwanda have reported small ruminant populations with high rates of gastrointestinal parasites especially GIN and generally low production (Mushonga et al., 2018). Additional to that, studies in Uganda have indicated that gastrointestinal nematode (GIN) are the main reason for output losses in commercial goat farms (Nsereko et al., 2016).

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