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**PREVALENCE AND RISK FACTORS ASSOCIATED WITH ANTHRAX DISEASE  
OUTBREAK IN CATTLE IN BUDUDA DISTRICT, EASTERN UGANDA**

**BY**

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### DECLARATION


I KUTOSI IVAN declare that this Research report is my original work and has not been submitted elsewhere for examination, award of a degree or publication. Where other peoples' work or my own has been used. This has been properly acknowledged and referenced in accordance with the BUSITEMA University requirements.

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Date.....23<sup>rd</sup> / May / 2023

**APPROVAL**

This undergraduate research report has been submitted for examination with my/our approval as research supervisor(s).

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## **DEDICATION**

I dedicate this piece of work to my beloved father, Mr. NAFUMA STEPHEN and mother NANDUTU GRACE who have done great work to ensure that I reach this far. Their love, care and support cannot be measured may the almighty God bless them abundantly. I also want to dedicate it to JANET, HAUMBA PETER, MOREEN, NAMANDA SEZI, OPUA ALLAN, AND MANY OTHERS who have always been together with me in the struggle; I wish you the best in your struggles always. Finally, I would like to dedicate this piece of work to all my friends, relatives who have supported me spiritually, morally, financially and encouraged me throughout this program.

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## **LIST OF ACRONYMS AND ABBREVIATIONS**

OIE: international office of epizootics

WAHID: World Animal Health Information Database

CDC: Center for disease control

DVO: District veterinary officer

ANOVA: Analysis of variance

FAO: Food and Agricultural Organisation

WHO: World Health Organisation

UVRI: Uganda Virus Research Institute

## ABSTRACT

**Background** Uganda is predominantly vulnerable to zoonotic diseases like anthrax; over 80% of Uganda's population is engaged in agriculture with 58% of these individuals involved in livestock farming. Anthrax is an endemic disease that affects cattle.

**Objective/Aim:** The purpose of this study was to analyze the prevalence and risk factors associated with anthrax disease in Bududa district.

**Method:** Community-based cross-sectional study was conducted among livestock owners, consumers, and professionals. A descriptive analytic study was used to describe cases based on the case definition, primary data, and secondary data. The primary data was collected from the field observations and interviews, questionnaires, with farmers and people in the community. The secondary data was obtained from Bududa District veterinary Office and ministry of agriculture website. The collected data was entered into a MS Excel spreadsheet.

**Data analysis:** This study applied content analysis techniques that described the actual situation of the community. Descriptive statistics was used where frequencies, proportions determined the magnitude of the disease. A two-factor ANOVA with repeated measures was used to test the hypothesis/answer the research questions: Pair-wise analysis using GENstat was also used to determine the ranking of the risk factors.

**Results;** The district reported approximately 70 death cases of Anthrax in cattle with the increased number between months of July and October 2022. There was a significantly high prevalence of Anthrax disease in the district which was under reported according to the comparisons of the Farmers' report and the District report ( $p < .05$ ). The statistical values of F-test were greater than the critical values of F. The pairwise analysis of Anthrax risk factors showed that the consumption of meat from dead domestic animals was significantly greater than the rest of the factors identified during this study.

**Conclusion:** These findings suggested that the prevalence of Anthrax disease was high in Bududa and identified the possible risk factors that could have accelerated the occurrence of the disease.

## CHAPTER ONE

### INTRODUCTION

#### 1.1 Background

Anthrax is an ancient and virulent zoonotic disease with a poorly understood ecology (Carlson, Getz et al. 2018), (Carlson, Kracalik et al. 2019). It is a disease of antiquity that continues to pose a threat as a biological weapon (Schuch and Fischetti 2009) Anthrax has been known since ancient times with the first descriptions dating back to Hippocrates, fifth century BC (Schwartz 2009). Anthrax is virtually a disease of all warm-blooded animals, including humans. The name 'anthrax' is derived from the Greek word, 'anthrakos', meaning coal, referring to the characteristic eschar in the human cutaneous form of the disease (Turnbull 2002). It has different names in different areas and named as splenic fever, wool sorter disease, Siberian ulcer (Charbon and Milzbrand 2003) . Anthrax spreads can affect public health, dating back from ancient times to the present (Mazaba ) which affects the socio-economic aspects and community welfare. Anthrax is an endemic disease caused by the bacterium *Bacillus anthracis* in several regions of the world (Joyner, Lukhnova et al. 2010), a Gram-positive, rod-shaped endospore forming capsule bacterium. *Bacillus* is immobile and exhibits aerobic or facultative metabolic characteristics (Tekin, Sula et al. 2015), meaning that it can survive even in extreme environments. The ultimate reservoir for *B anthracis* is soil (Turnbull, Kramer et al. 1996). The soil cycle is complex and incompletely understood. However, it is clear that *B anthracis* can persist in soil for decades. Spores are the usual infective form. This bacterial zoonosis affects both domestic and wild herbivores and also leads to a secondary infection in humans (Hugh-Jones and De Vos 2002). Herbivores, particularly grazers, can take up the spore from infected soils during grazing, become infected, and return spores to the soil when they die and decompose (FAO, 2008), as cited by Onyuth, (2021). Currently, 1.8 billion people worldwide live in areas that are suitable for anthrax (Carlson et al., 2018). Furthermore, 1.1 billion livestock and 63.8 million low-income livestock keepers live in anthrax-risk areas with more than half from Sub-Saharan Africa and Asia respectively. An estimated 20,000 to 100,000 cases of anthrax occur annually worldwide, mostly in poor rural areas (Carlson et al., 2019). Outbreaks have been

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