# INVESTIGATING THE LEVEL OF CONTAMINATION OF FRESH NILE PERCH (*Lates niloticus*) BY *ESCHERICHIA* COLI AND SALMONELLA FROM LALLE LANDING SITE, ARAPAI MARKET AND SOROTI MAIN MARKET.

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**RESEARCH DISERTATION SUBMITTED TO THE FACULTY OF AGRICULTURE AND ANIMAL SCIENCES IN PARTIAL FULFILLMENT OF AN AWARD OF A BACHELOR'S DEGREE IN ANIMAL PRODUCTION AND MANAGEMENT OF BUSITEMA UNIVERSITY.**

**March, 2024**

## DECLARATION

I hereby declare that, this work is truly my original work and it has never been submitted in any institution for any academic award.

**Student**

AJARUVA NANA ANNET

Signature.....

Date.....15/03/2024.....

This research proposal/thesis is submitted by the approval of

## APPROVAL

This research was written under my supervision and guidance it will be submitted to the department of Animal Production and Management for examination with my approval as the supervisor.

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## DEDICATION

I dedicate this dissertation to my friends and family members more especially to my beloved mother Ms. Binengo Cecilia, Sister Akumu Grace, my brother Dr Kissa Charles, and my academic supervisor and mentor Dr. Matovu Henry.

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I would to take this opportunity to thank my academic supervisor for the guidance. My beloved brother Dr Kissa Charles and sister Akumu Grace for great financial support they rendered to me and my sincere appreciation and thanks goes to all the management staff, lecturers, and stakeholders of Busitema University Arapai campus

Contents

## LISTS OF ABBREVIATIONS

Dr ……..Doctor

E.coli ……..Escherichia coli

ie……. That is to say

XLD…….....Xylose Lysine Deoxycholate

$^{0}$C ……..... degree celicius

cfu/g…….. coliform forming units per gram

Ml ……... Mill in litres

FDA ……Uganda Food and Drug Authority

WHO …….. World Health Organisation

df…….. Degree of freedom

f……..…... f values

sig ……..... level of significance ( p- values )

UNBS ……...….. Uganda National Bureau of standards

## ABSTRACT

Fish and fish products are a food with a high nutritional value, however fish may contains *Escherichia coli* and salmonella which cause foodborne infection out breaks in humans. The aim of the study was to identify and compare *Escherichia .coli* and salmonella in skin, muscles and intestine for fresh Nile fish samples collected Arapai market, Lalle landing site and Soroti main market. Fifteen fish samples were collected, 5 samples each from different traders and fishermen. MacConkey agar was used for isolation of *Escherichia coli*, Xylose Lysine Deoxycholate media (XLD) for isolation of salmonella, *Escherichia coli* was tested using idole ring test.

The total coliform microbial load count from the Nile perch fish samples was higher than the standard mean log (2.00-6.00 cfu/g) required by UNBS hence this microbial count causes food poisoning hence fish were not recommended for human consumption. P-value ($P \leq 0.05$) indicate that there was a significant difference in total coliform count on hence implying that the different areas of study had different pathogens of food poisoning which would cause intoxication of fish. The mean log for microbial E-coli count was higher than the standard required by UNBS hence this microbial count causes food poisoning hence fish were not recommended for human consumption. The P value ($P \geq 0.05$) for the mean log for the microbial load of E-coli indicate that there was no significant difference of E-coli for the study areas. The mean log for salmonella was within the range of the standard mean log hence this microbial count does not cause food poisoning hence fish were recommended for human consumption. The P-value ($P \geq 0.05$) for the mean log of Salmonella shows that there was no significant difference in total microbial load of Salmonella hence implying that the different areas of study had statistically similar levels of microbial count of Salmonella which caused fish intoxication in these respective areas of study.

It was concluded that total coliform microbial and E-coli count were higher than the standard recommended by UNBS however the count for salmonella was within the standard range hence the fish is recommended for human consumption. Therefore more research should be done on Bacillus cereus count in Arapai market, Soroti and Lalle landing site.

# CHAPTER ONE

## 1.0 Introduction

## 1.1 Background

According to Bondad-Reantaso *et al*.(2012),fish is the most important source of protein for human nutrition and a vital part of the diet for people everywhere. Fish is a highly nutritious and protein-rich food source that makes about 60% of the world's protein (Emikpe *et al*., 2011). However, improper handling, processing, and storage methods cause bacterial contamination, which poses serious health risks to the public with regard to fish. Fish detoriation begins as soon as it is harvested and landed, post-harvest losses can result (Obar et al., 2015).

According to Allocati *et al*.(2013),*Escherichia coli* is the primary bacterium causing food intoxication worldwide, food-borne intoxication infection rates estimate that 7.69% (600 million) of the world's population is intoxicated by food, 7.8 billion are afflicted with food-borne diseases, and 7.5% (420,000) of deaths worldwide are attributable to food-borne illness (Kirk *et al*., 2015). In Africa *Escherichia coli* and salmonella causes major challenges to the health of the people leading to illness (Akhtar et al., 2014).About 1.3 million Ugandans are diagnosed with food-borne illnesses each year, accounting for 14% of all infection (Afolabi *et al*., 2021).

Among other pathogens invading fish and fish products, salmonella and *Escherichia coli* have emerged as the most common food poisoning germs (Herikstad *et al*., 2002). *Escherichia coli* and salmonella species are carried and transported by fish and fish products as a result of unsanitary handling and processing, faecal contamination of the water where fish are harvested and inadequate sanitation practices (Bibi *et al*., 2015). Fish are major carriers of salmonella that cause pathogenic diseases, the microbes are acquired by the fish from their contaminated living environment and from handling procedures. Both industrialized and developing nations experience a worldwide burden from salmonella gastroenteritis (Majowicz *et al*., 2010).

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