



**ASSESSMENT OF THE FACTORS ASSOCIATED WITH
CONTAMINATION OF RAW MILK PRODUCED IN OKILE SUB
COUNTY, KABERAMAIDO DISTRICT.**

BY;

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**A RESEARCH DISSERTATION SUBMITTED TO THE FACULTY OF
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Abstract.

Microbial contamination of milk is a worldwide problem. Milk is a highly nutritious food for humans, but it serves as an excellent medium for the growth of many bacterial organisms. Several factors are known to predispose milk to contamination during production processes. In this study, the factors that predispose milk to contamination and the level of selected bacteria, i.e., *E. coli* and *Staphylococcus* in the milk consumed in Okile Sub County, Kaberamaido district, were determined by using the pour plate technique. The factors that predispose milk to contamination noted in this study were, dirty animal houses, dirty milking area, not washing the teats before milking, not covering milk etc. Contaminated milk has direct nutritional and economic effects on livestock farmers. A total of 30 questionnaires were administered to 30 farmers, and 30 milk samples were collected. This is the first study that reports on the presence and the level of selected bacteria in the milk consumed in this locality. The level of *E. coli* ranged from 6.1 to 0.53 log₁₀. *Staphylococcus* levels ranged from 5.3 to 0.61 log₁₀. There was a significant difference between the levels of *E. coli* and *Staphylococcus* and the international reference values by the WHO and FAO ($P < 0.05$). The levels of selected microbes were significantly higher than the recommended limits. Therefore, environment, production, and storage conditions have great influence on the milk bacterial quality. There is need by the farmers to stick to good hygienic practices during milk production processes.

DECLARATION.

I **ENGORU DANIEL** declare that the entire work in this dissertation is personal and has not been submitted to any institution for any academic award.

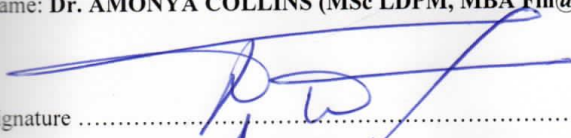
APPROVAL

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Signature..... 

Date..... *21 June 2023*

Dedication.

I dedicate this piece of work to my parents, Elweu Moses, and IdimoHellen, to my brothers, sisters, and friends.

Acknowledgement.

I thank the Almighty God for the gift of life he has rendered on to me and having enabled me reached this level of Education.

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List of abbreviation.

&	And.
<	Less than
%	Percent.
Dr.	Doctor
<i>E. coli.</i>	<i>Escherichia Coli.</i>
HCCP	Hazard Analysis Critical Control Point.
ml	Milliliter
ISO	International Organization for Standardization.
U.N.B. S	Uganda National Bereaouf Standard.
W.H. O	World Health Organization.
CFU	Colony Forming Units.

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Chapter one: Introduction.

1.0. Chapter one.

1.1 Background.

Milk is among the most highly nutritious and valuable human food, but it is also an ideal medium for the growth of a number of microorganisms, especially bacterial organisms (Owusu-kwarteng et al., 2020). There is a constant challenge in milk production to prevent or reduce the introduction and subsequent growth of micro flora in milk (Oladipo & Tona, 2016). The production of milk is influenced by the use of improper procedures during milking, handling, and after milking, leading to microbial spoilage of milk (Fusco et al., 2020).

Despite the fact that milk is sterile at secretion, contamination of milk with *E. coli*, *Staphylococcus aureus*, and other pathogenic microorganisms can take place during milk handling, storage and other preprocessing activities (Silva et al., 2016). *E. coli* is a notorious milk contaminant and has been associated with the cause of many disease outbreaks (Heiman et al., 2015). In the previous years, cattle were the main reservoir of pathogenic *Escherichia coli* commonly, a major milk borne pathogen (Vellathurai, 2010). *E. coli* infection is associated with the consumption of unpasteurized milk (Keene et al., 1997).

Staphylococcus is a facultative anaerobic gram positive bacterium that causes foodborne intoxication with outbreaks throughout the world, while surviving and multiplying in a variety of temperatures (7 - 48.5)⁰C and PH values (4.5 - 9.3), (Heidinger et al., 2009), and consumption of contaminated raw milk is among the vehicles of transmission of this pathogenic organism (Kivaria, 2006)

Despite the risks of raw milk consumption, attempts to avoid the sale of raw milk have been unsuccessful (Guh et al., 2010). There is a need to eliminate the contamination of milk with *E. coli*, and *Staphylococcus* since they pose a threat to the public. This can only be achieved after establishing the levels of these organisms in milk and tracing the possible sources of contamination so that corrective measures can be taken. Several microbiological count methods are available for monitoring the hygienic quality of raw milk and detection of *E. coli*, and, *Staphylococcus aureus*. Among them, the pour plate method is the recommended method for counting the number of colony-forming units in milk samples according to International Organization for Standardization (ISO) No. 4833-1:2013 (Belli et al., 2013).

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