ASSESSMENT OF ANTIBIOTICS IN RAW MILK PRODUCED AND SOLD BY SMALL SCALE DAIRY FARMERS OF KABERAMAIDO DISTRICT

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A DISSERTATION SUBMITTED TO THE FACULTY OF AGRICULTURE AND ANIMAL SCIENCES IN PARTIAL FULFILMENT OF REQUIREMENTS FOR THE AWARD OF BACHELOR DEGREE IN ANIMAL PRODUCTION AND MANAGEMET.
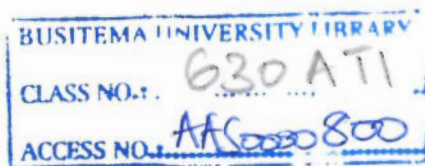
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DECLARATION

I *ATIM BRIDGET* declare that this dissertation was of my own effort and has not been submitted by any student to any university.

Sign: ....

Date: ...15th Sep., 2019...

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APPROVAL

This dissertation has been submitted for marking to Busitema University Arapai Campus with the approval of the academic supervisor (Lecturer)
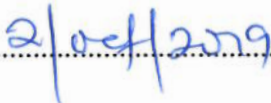
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DEDICATION

This dissertation is dedicated to Village 2 Village Project Serere which really made the effort to see me study in life. Especially to Alice and Rick Leeds, Mary and Jim Klink, Steven and Theresa Sacks and Mama Laurie in the USA. I also dedicate to myself for having endured with all the challenges in Education and not forgetting to my future children to come.

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LIST OF ABBREVIATIONS:

OTC: Oxytetracycline.

HPLC: High Performance Liquid Chromatography.

TC: Tetracycline

MRLs: Maximum Residue Limits

FAO: Food Agriculture Organization

WHO: World Health Organization

CRS: Certified Reference Standards

TPC: Total Plate Count

MBRT: Methylene Blue Dye Reduction Test

N_aOH: Sodium Hydroxide

NA: Nutrient Agar

°C: Degree Celsius

CFU: Colony Forming Units

BUAC: Busitema University Arapai Campus

ABSTRACT

Milk is an important source of nutrients to human and animals, however, the use of antibiotics in the treatment of animals has created problems for the milk processors and consumers causing economic losses to the dairy industry. This study was to assess antibiotics in raw milk produced and sold by small scale dairy farmers of Kaberamaido district.

Quantitative study was conducted to establish the presence of antibiotics in raw market milk. A total of 60 milk samples were collected for laboratory analysis including milk acidity and microbial quality tests. The milk samples were collected from four milk vendors and were repeated five times. 0.1 N Sodium Hydroxide was titrated with 1 ml of phenolphthalein indicator to determine acidity in milk sample. Nutrient Agar (ISO – 6579 ISO -10273 ISO 19250) was used to prepare culture media and Serial dilution (10^{-3}) was carried out using 1ml of milk sample to determine microbiological quality through Total Plate Count.

Results showed that, 75% of the milk was above the normal acidity of milk and 25% was below the normal range of milk acidity. The average acidity of milk is 0.19 which is higher than the normal range of milk acidity. The probability value was p= 0.0138 giving the mean of 0.1885. This showed that there is a significant difference in the acidity of milk. For antibiotic presence in milk, the probability value was p= 0.2060 and this indicated that there is no significant difference in acidity of milk. The acidity of milk was above the normal range implying that there was no antibiotic used. The microbiological quality of milk showed that the average of microbiological quality is 308.5; which were above the normal range of microbial load in milk. The probability value was p= 0.0092 which indicated that there is a significant difference within the microbial load. Therefore the suppliers of milk in Kaberamaido still need to improve on their hygiene on milk handling.

The milk was safe from antibiotics implying that milk vendors did not use any antibiotic as a preservative and farmers followed drug withdrawal periods.

1.0 CHAPTER ONE: INTRODUCTION

1.1 Background

There are major roles of milk in human nutrition at different ages which are essential hence improving on the health standard in life. Different drugs today are used for controlling diseases or accelerating growth that residues may transfer to the milk (Yarabbi, Mortazavi, Zenozian, Mehraban, & Atash, 2014). Foods like milk, meat and eggs for human consumption should not have deposits of antibiotics. If these foods are to be consumed after the use of antibiotics, withdrawal period must be seriously observed until the residues are no longer detected (Nisha, 2008). The availability of these drugs in the milk and other products are not acceptable by international standards because pharmaceutical compounds of the residues, specially antibiotics, in milk and dairy products cause health problems such as allergic reactions, digestive problems and spread of antibiotic- resistant strains of bacteria and drug resistance is a serious threat to the health of consumers (Yarabbi, *et al*; 2014). The use of antibiotics frequently can result into drug residues in different animal products that can be found at different concentration levels, like milk or meat. The availability of drugs or antibiotics residues in food above the maximum level recognized world-wide by various public authorities is not accepted. (RIDHIWANI & A, n.d. 2015).

The antibiotics available include: tetracyclines, penicilllins, sulphonamides, ampicillins, quinolones, chloraphenicols, among others.
These antibiotics are necessary drugs which are required to treat animal infections. The effectiveness of these antibiotics can be threatened by extensive and inappropriate use by drug handlers. Antibiotics are used at therapeutic levels   mostly to treat diseases and prophylactic treatment (RIDHIWANI & A, n.d. 2015). Antibiotics are also used at sub-therapeutic levels for increasing feed efficiency, promoting growth and disease prevention in animals (RIDHIWANI & A, n.d. 2015). Consumption of milk after using antibiotics and also not following instructions on medication has increasingly led to antibiotics in milk. Existence of the antibiotic residues clearly indicates misuse of antibiotics and insufficient withdrawal period followed as recommended by drug manufacturers (A Professor & Menon, 2018). Apart from failure to adherence to withdrawal periods after antibiotic treatment in animals, antibiotic residues can be found if animals ingest feed contaminated with antibiotics (Ahlberg, Korhonen, Lindfors, &

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