
**FACULTY OF AGRICULTURE AND ANIMAL SCIENCES
DEPARTMENT OF CROP PRODUCTION AND MANAGEMENT**

**PHYSICAL AND SENSORY EVALUATION OF COFFEE FROM DIFFERENT
ALTITUDES IN THE NORTHERN ELGON REGION IN UGANDA**

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BU/UP/2019/2516

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**A RESEARCH PROJECT REPORT SUBMITTED TO THE DEPARTMENT OF CROP
PRODUCTION AND MANAGEMENT IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR THE AWARD OF A DEGREE OF BACHELOR OF SCIENCE
IN AGRICULTURE OF BUSITEMA UNIVERSITY**

MARCH, 2024

DECLARATION

I Masinde Jimmy Keneth, declare that the work in this research project report is my own and has not been submitted for the award of any academic document in any other University.

Signed



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Date

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APPROVAL
This research project report has been submitted for examination with our approval as the
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DEDICATION

I dedicate this work to my guardians Dr. Masinde Joel Jimmy and Ms. Angela Taylor Sab for their endless love and support always rendered to me.

In the same vein, this piece of work is dedicated to my supervisor, Prof. Michael Masanza. It has really been life changing academic wise interacting with the right knowledge.

ACKNOWLEDGEMENT

I am highly delighted with great honor to convey my gratitude to the administration of Busitema University, Arapai campus.

I also convey my sincere thanks to the Department of Crop Production and Management of Busitema University for the wonderful mentoring always offered.

In the same vein, my sincere appreciation goes to my supervisor; Prof. Michael Masanza for the guidance and corrections offered to me. Appreciation still goes to Busitema University especially Mr. Amayo Robert, the BSA Research Coordinator, Dr. Opio Peter, HOD Crop Production and Management, Dr. Geoffrey Lubadde for the guidance and academic support offered during my time of study.

I do extend my gratitude to all my friends for the company and psychological support during my time of study at the University. May the Almighty God bless you all.

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LIST OF ABBREVIATIONS

CRD	Completely Randomised Design
UCDA	Uganda Coffee Development Authority
HOD	Head of department
USCL	Ubora Specialty Crops Limited

ABSTRACT

Coffee is the second most traded commodity worldwide after oil both in terms of volume and value. The consumer market worldwide has a strong preference on specialty coffee, hence calling for an understanding on the influence of altitude on coffee quality. Therefore, this study aimed to analyze the physical and sensory attributes of coffee in the northern Elgon region of Uganda. The physical attributes (100 bean weight and screen sizes) and cup quality (aromatic quality, acidity, body, flavor, overall standard, and total cup quality) parameters were evaluated by a team of certified panelists at accredited UBORA SPECIALITY CROPS LIMITED laboratory in Mbale City Eastern Uganda. The results depicted significant variations in physical quality parameters and sensory attributes of coffee grown at different altitudes ($P \leq 0.05$). For high altitudes such as Bulambuli (1800-2200 m.a.s.l), Kapchorwa highest (1800-2200 m.a.s.l) and Bududa highest (1800-2200 m.a.s.l), coffee grows with greater cup quality characteristics (acidity, fragrance and homogeneity) with lower altitudes (Bududa (1400-1500 m.a.s.l) and Bulambuli (1400-1500 m.a.s.l)) coffee had the lowest cup quality and moderate at mid-altitude areas such as Bududa (1500-1600 m.a.s.l), Kapchorwa (1800-2000 m.a.s.l) and Bulambuli (1600-1800 m.a.s.l). As there were higher 100 seed weight of coffee beans at Bududa highest (1600-1750 m.a.s.l) as compared to other altitudes. The highest percentage screen size of coffee beans was observed at Bududa highest (1600-1750 m.a.s.l) followed by mid and lower altitudes. However Arabica coffee grown at Bududa higher showed the highest coffee cup quality among the assessed elevations and also the in physical parameters hence for better cup quality. Therefore, farmers should grow coffee under higher altitudes for better cup quality.

Key words: Coffee beans, Cup quality, Sensory attributes, Northern Elgon

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CHAPTER ONE

1.0 INTRODUCTION

1.1 Background of the study

According to Hameed *et al.* (2020) coffee ranks second globally in terms of both volume and value of commerce after oil. Over 10.2 million hectares of land in more than 80 nations are covered by the crop, which is farmed in tropical and subtropical regions worldwide. Ethiopia is among the developing countries in Africa that is most dependent on coffee exports (Hameed *et al.*, 2020). Approximately 20% and 40% of the world's coffee, respectively, is produced in Vietnam and Brazil combined. The biggest producer of coffee is Brazil. According to (Raveendran & Murthy, 2022), the top ten producers of coffee were Brazil, Vietnam, Colombia, Indonesia, Ethiopia, Peru, India, Uganda, Honduras, and Mexico, with a total of 165 million bags produced globally in 2019. Uganda receives 20–30% of its foreign exchange revenues from the cultivation of coffee (Akoyi & Maertens, 2018). Eighty percent of Uganda's coffee is Robusta, while twenty percent is Arabica (Bunn *et al.*, 2019).

The recently finished 2021/2022 coffee year, which ended on September 30, saw record profits of US\$876.4 million from Uganda's coffee exports. Despite a drop in export numbers, this translates into a 39% gain in revenues over the prior year. Particularly Arabica and Robusta coffees are the two varieties of coffee farmed in Uganda; they vary in a number of aspects, including growing circumstances, chemical makeup, and properties of the brew produced from the ground, roasted beans (Campuzano-Duque & Blair, 2022). Due to its enhanced sensory qualities in the cup, Arabica coffee commands a higher price (Campuzano-Duque & Blair, 2022).

Coffee quality is determined by a number of factors, including its genetic origin, cultivation conditions (soil type, altitude, and climate), hygienic practices, agronomic practices, harvest care (harvest maturity), and postharvest handling (production process type and control, storage, roasting, and beverage preparation (Morjaria & Sprott, 2018). According to Morjaria & Sprott. (2018), the variables that determine the acceptability and characterization of bean quality include fragrance/aroma, flavor, aftertaste/remaining flavor, body, acidity, balance, and hygienic quality

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