



**BUSITEMA
UNIVERSITY**
Pursuing Excellence

**FACULTY OF ENGINEERING
DEPARTMENT OF CHEMICAL & PROCESS ENGINEERING
BSc. AGRO-PROCESSING ENGINEERING**

DESIGN & CONSTRUCTION OF A HONEY EXTRACTION LINE

By

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ABSTRACT

Natural honey is one of the most widely sought products due to its unique properties, which are attributed to the influence of the different groups of substances it contains. Honey is used for nutritional, medicinal and industrial purposes and it is an important commodity in the local and international markets and serves as a source of income to many farmers and processors. In Uganda, honey production (beekeeping) has the potential to develop as a prime agro-horticultural and forest-based industry which can be a major foreign exchange earner if international standards are met. However, the practice of rearing bees in Uganda is not common in many places due lack of efficient modes of harvesting and processing honey. In many local areas, bees are considered dangerous insects which cause harm to animals and people. This mystery has led to redundancy by many people to indulge in beekeeping.

The few farmers who harvest honey have poor methods of processing the honey. Some apiarists pound the honey and put it on a basket, it's then left to drop until the comb debris is left empty on the basket. Other apiarists boil the combs containing honey and add water, then filters out honey.

All these modes of processing honey destroy yield poor quality honey as the processed honey mixes with wax and also has smell of cooked flavor, hence altering the biochemical and physical characteristics of honey.

The methods aforementioned destroy the honey combs which could be returned to the hive for refiling by bees. This constraint thus leads to long gestation period for bees to manufacture honey as they have to rebuild another comb before refilling it with honey.

This study intended to construct a line of extracting honey from the combs without destroying it and altering the characteristics of honey. The line of extraction is made simple, consisting of uncapping knife, extractor machine, bucket with sieves and bucket for collecting strained honey.

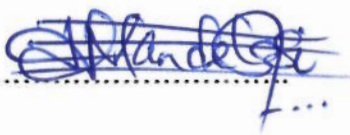
After construction, the performance and economic analysis of the extraction line were performed in terms of extraction efficiency and extraction loss, resulted into 64% extraction efficiency and 16% losses. Total cost; Ugx.763,000. Cost of extraction; Ugx.7,000, net income; Ugx.1,500,000, Breakeven units; 120litres of honey and pay back-period of 0.51years

Owing to the performance and economic analysis of the extraction line, it achieves all its design purposes hence it is recommended for commercialization and adoption by the target groups.

DECLARATION

I Mandela Simon do solemnly affirm that this project proposal was written by me and it is a record of my research work. It has not been presented before in any previous application for the Award of Bachelor of Engineering in this or any other university. All the published and unpublished work of others used has been duly reference.

Date: 22/05/2018

Signature: 



APPROVAL

Main Supervisor: MR. SSEMUKASA EDWARD

Date:

Signature:

Co-Supervisor: MR. KIYEMBA ANDREW

Date:

Signature:

DEDICATION

This work is dedicated to my mother, Nagudi Christine, who has not lived to share this humble achievement. It would have been a great joy and honor to her ultimate wish; emancipation through education.

She was a remarkable person who believed in education as a tool of emancipation. For her love and inspiration, I am what I am. This humble achievement is a direct result of the sheer pressure she put on me to succeed at all costs. She did not only take interest in my success but also made huge sacrifices to help others in need to take on education.

In doing these, she made her humble contribution to the growth of this nation, if not, this world. To her, I owe a lot.

May her soul rest in eternal peace.

ACKNOWLEDGEMENT

With profound sense of gratitude and deep appreciation, I would acknowledge financial and prayerful support availed to me by my parents in particular Mr. Nabubolo John, Miss Nagudi Christine (RIP) and my brother Mr. Nabuzenjeji Philemon.

My profound and deepest gratitude goes to my project supervisors Mr. Ssemukasa Edward and Mr. Kiyemba Andrew for their care, concern and guidance on this project.

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CHAPTER ONE

1.1 INTRODUCTION

This chapter describes the background information of the project, the problem statement, and justification of the study, purpose, objectives and the scope of the study. The problem statement describes the problem of the study and identifies potential causes and solution. The justification describes the importance of the project and the specific objectives will guide in achieving the main objectives.

1.2 BACKGROUND OF STUDY

Bees are winged insects which feed on flowers and have branched body hairs. They depend on pollen as a protein source and on flower nectar or oils as an energy source (Akinnuli *et al.*, 2016). Bees play a major role in pollination of crops and the abundant harvest from the hives as the flowering plants/crops provide a source of nectar and pollen for the bees (Ogaba, 2002). Their interdependence with green plant makes them an excellent example of the type of symbiosis known as mutualism (two parties of an unlike organisms benefits from each other). Honey bees and stingless bees are characterized with the ability to hoard large quantities of honey, a major reason why beekeepers exploit this opportunity and harvest the honey for human consumption (Airborne Honey Ltd, 2014). Honey is the main source of carbohydrates for bees and contains many of the same compounds found in a healthy human diet. Honey as the natural food product resulting from the harvest of nectar or honeydew by honey-bees and the natural activities of the honeybees in processing nectar or honeydew (ASB, 2017). Beekeeping (*Apiculture*) is the practice of managing the colonies of bees for the production of honey and other hive products. The traditional methods of collecting honey involve the destruction of the entire colony when the honey is harvested (Mikhael Miklyaev, 2013). The wild hive is crudely broken into, using smoke to suppress the bees. The honey combs are torn out and smashed up along with the eggs, larvae and honey they contain (Chemurot, 2011). The liquid honey from the destroyed brood nest is crudely strained through a sieve or basket.