



**BUSITEMA  
UNIVERSITY**  
*Pursuing Excellence*

**FACULTY OF ENGINEERING**

**DEPARTMENT OF CHEMICAL AND PROCESS ENGINEERING**

**DESIGN AND CONSTRUCTION OF AN ELECTRIC**

**MAIZE ROTISSERIE**

**BY**

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as a partial fulfillment of the requirements for the award of Bachelor's Degree in Agro-  
Processing Engineering*

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**DECLARATION**

I **Ssali Douglas** declare to the best of my knowledge that the work presented in this proposal report is my own and has never been presented to any University or higher institute of learning for any academic award.

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Date..... *28<sup>th</sup> / MAY / 2018*



**APPROVAL**

This proposal report has been submitted to the Department of Agro-Processing Engineering for examination with approval from the following supervisors:

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## **DEDICATION**

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## **ABSTRACT**

Food processing is a very important aspect in daily consumption. Food processing is the way raw ingredients are transformed into consumable food. Roasting makes maize edible for consumption in the home or small entrepreneurs by the vendors. Roasting is done using barbecue where the device cooks food by applying heat directly from below.

Selling roasted maize is the most common source of income to most small scale maize growers. And the roasting process requires continuous fanning of charcoal to maintain the charcoal burning, which is a stressful practice. Many technologies have been developed to make roasting process easy but these technologies are not in Uganda. In order to reduce the stress when roasting maize, know the level of cook, and to also increase efficiency, the development of an electric maize roasting machine was observed necessary.

The design parameters of maize rotisserie was done depending on the available researched technologies available on market in different developed countries. Experimental research design was adopted in the investigation to determine the efficiency of the maize rotisserie for roasting maize cobs. The machine performance efficiency was calculated and it was 71.4%. And the vendors were observed to take less time to roast many number of cobs in batch than when using tradition methods. Also hygiene of roasted cobs was improved since it is a clean operating process when using an electric maize rotisserie.



## **CHAPTER ONE: Introduction.**

### **1.1 Background**

Food Processing is very important aspect in our daily consumption. Processing of food means the methods and ways used to transform raw ingredients into consumable food. It can also be defined as a process by which a raw food is transformed to edible food for consumption, either in the home or by small entrepreneurs on the roadside (vendors). The devices used for roasting maize are barbecue and similar other devices. The barbecue is a device that cooks food by applying heat directly from below i.e. the food is placed directly on the source of heat.

Roasting is the process by which agricultural products are exposed to dry heat in an oven or over a fire for the purpose of reducing moisture and cooking of the products, making them suitable for consumption.

Roasting is a common method for processing food and it usually uses dry heat on an open flame or oven or other heat source. Roasting is the mechanism by which the food product materials are subjected into irreversible structural changes and reduction of moisture contents with the purpose of bringing digestible content for human consumption (Fellow, 2000). Roasting usually causes caramelization of the surface of the food, which is considered a flavor enhancement (Wikipedia, 2010)

The word 'Barbecue', means a fire place or a pit for grilling food, typically used outdoors and traditionally employing hot charcoal as the heating medium. Maize cobs are processed by roasting on live charcoal using charcoal stoves. In early days the farmers used to sit around an open fire in the field roasting the freshly picked maize cobs. Later, the maize cobs were brought to the town and sold by sidewalk vendors.

There are several advantages of roasting on a barbecue /rotisserie grill with respect to the flavor, convenience, versatility of fuel, versatility of style of barbecue cooking and versatility of recipes. Maize cobs are one such food that is processed in both a barbecue and a grill.

Roasting of maize is done by placing maize over burning charcoal-stove and keep on turning it to prevent over burning. Roasting is a method of cooking, and it improves digestibility of maize.

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