



**BUSITEMA
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Pursuing Excellence

**FACULTY OF ENGINEERING
DEPARTMENT OF CHEMICAL AND PROCESS ENGINEERING**

FINAL YEAR PROJECT REPORT



**DESIGN AND CONSTRUCTION OF MANUALLY OPERATED
CHICKEN DE-FEATHERING MACHINE FOR SMALL SCALE
CHICKEN PROCESSORS IN UGANDA**

By

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ABSTRACT

Consumption of chicken as a source of protein is on the increase in Uganda. Removing feathers by hand is the traditional means and method of de-feathering chicken. For many reasons, removing feathers by hand is one process which is time consuming, cumbersome, low output and results into injuries. Development of a manually operated chicken de-feathering machine is a process of producing a mechanical means of removing feathers from scalded birds. This report focuses on development of a manually operated chicken de-feathering machine for small scale chicken processors in Uganda using locally available materials.

Design calculations were done appropriately to ensure correct shaft diameter as this could affect the efficiency of the machine. The machine consist of rotating drum with protruding rubber fingers and stationary shaft with rubber fingers attached which carries out the actual plucking of the feathers. The machine was test with six sample chicken per batch in two trials after being in soaked inside hot water at about 70°C and held for about 45-60s. The efficiency of each trial was calculated and average efficiency was 70.8% implying that the machine is viable.

DECLARATION

I JERRY BOBTUVIUS declare to the best of my knowledge that this project report has been compiled out of my personal research and effort and it has never been submitted to any institution or university for any academic award.

DATE 20th May / 2015

SIGNATURE 



APPROVAL

This project report has been submitted to Faculty of Engineering for examination with approval from the following supervisors:

Ms. KABASA SALLY

SIGNATURE

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Mr. OTIM DANIEL

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DEDICATION

This report is dedicated to my family members especially my parents for the contributions of every kind received from them as a token towards my project, parental guidance and counseling plus encouragement in all my academic endeavors.

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CHAPTER ONE: INTRODUCTION

1.0 Introduction

This chapter provides general information relevant to the research topic and its significance to the development of manually operated chicken de-feathering machine.

1.1 Background of the study

Chicken production is the main type of poultry production raised in all parts of Uganda with the population of was over 40 million birds as per Food and Agriculture Organization statistics (2010). Chicken production in the country is conveniently categorized into two; namely; commercial or free-range thus chickens are categorized into two distinct breeds: the local indigenous chicken; and the exotic chicken types. Chicken rearing is an active source of livelihoods and food security for over 3.2 million households. The majority of chicken-owning households (99.2%) own indigenous chicken; in contrast to only (1.2%) who owned exotic chicken. The highest concentration of exotic chicken is around towns and urban centers especially in Kampala and the neighboring Wakiso and Mukono districts where commercial broiler and layer enterprises are primarily concentrated (Denis. K. Byarugaba 2007). Chicken meat is a white meat, distinguished from other meats such as beef and lamb by its lower iron content .It is of a consistently high quality, is low in saturated fats, and it provides the most important health benefits such as protein, micronutrients, higher poly-unsaturated fatty acids and less cholesterol, which, in turn, increases popularity of poultry meat. Chicken meat does not contain the Trans fats that contribute to coronary heart disease (Sams, Alan R. 2001) and as per recent household survey carried out by Food and Agriculture Organization statistics (2010) gauges the size of demand for chicken meat is alternatively established from the volumes of chicken slaughtered. Available statistics for chicken slaughtered are currently 48,750 tones and demand is growing at about 3% per annum. These slaughter numbers imply a per capita consumption of 1.7kg/person/year, which is in sharp contrast with other developed countries like South Africa with a chicken per capita consumption of 32 kg/person/year. At the moment Uganda hardly exports any chicken or chicken products. Records from Ministry of Agriculture, Animal Industry and Fisheries (2010) show that only 14, 000 kg of chicken meat (a mere 3% of total production) was exported by Uganda during 2011 to DRC, South Sudan, Rwanda and

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