BUSITEMA UNIVERSITY
Pursuing Excellence

FACULTY OF ENGINEERING

DEPARTMENT OF CHEMICAL AND PROCESS ENGINEERING

FINAL YEAR PROJECT REPORT

DESIGN AND FABRICATION OF A MANUAL TILAPIA FISH DESCALER

BY

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ABSTRACT

Uganda's economy is largely agro-based and with the growing technology it has to meet the need of farmers and markets both locally and internationally. Uganda has merged to one of the largest producers of fish in East Africa and Tilipia fish being one the potential nutritious foods (sauce) in many regions of the country and outside the country consumed in various forms (frozen, dried, smoked, deep flied,boiled etc) depending on consumer preference. Fish descaling is one of preliminary fish processing operations, due to lack of affordable descaling machines, in Uganda the descaling operations are done using rudimentary tools such as knives which are time consuming, labour intensive and involve high risk of injuring man descaling. Some manual fish descalers that exist are expensive thus un-affordable by local fish processors hence limiting the out put of fish. Therefore their is need of a fish descaler which reduces time, drudgery, and injury to man descaling due to the increased demand for fresh processed fish.

Therefore this study objective was to design and construct a manual fish descaling machine which could enable fish processors descale their fish at fast and enhance quality production of fish prime products. The design and construction of the various components of the fish descaler was curried out by analyzing forces acting on them so as components do not fail during operation. Force analysis led to the selection of proper materials to withstand forces to avoid failure. Engineering drawings of the various components of the descaler were designed and drawn before the various components were constructed. Then machine assembly was done last according to the engineering drawings and the performance of the machine was tested. Summarily, this prototype development of a manual tilipia fish descaler, if implemented, will provide a great remedy to the challenges faced during local descaling of tilipia fish on the various landing sites and markets where fish is processed in Uganda .

DECLARATION

I hereby declare that the contents of the synopsis, "design and construction of a manual tilapia fish descaling machine" are product of my own research and no part has been copied from any published source (except the references, standard mathematical or genetic models/equation/formulate/protocols etc.). I further declare that this work has not been submitted for award any other diploma/degree. The university may take action if the information provided is found inaccurate at any stage

Signature..... Date..15th/MAY/2019.

Name..Mulondo Anthony.....

APPROVAL

This project proposal is submitted to the Faculty of Engineering for examination with approval of my supervisor and the contents are satisfactory for the award of the degree

Supervisors

Signature ..... Date.....

Mr. ASHABAHEBWA AMBROSE

DEDICATION

This report is dedicated to my beloved parents Mr. Mulondo Nathan and Ms. Byogero Mariam in appreciation for their selfless care and unflinching support provided to me since childhood, and for the spirit of hard word, courage and determination instilled into me, which attributes I have cherished with firmness and which have indeed made me what I am today.

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CHAPTER ONE

1.0 Introduction

This chapter briefly give the background of the study topic, problem to be a dressed by the study, justification of the study, the objective and the scope of the study.

1.1 Background

Fish is an excellent source of protein, lipids, vitamins and mineral nutrients people need for a good diet. Fish flesh contains water (60-84%), protein (1 5-24%), fat (0.1 -22.0%), and mineral usually 1 -2% (Oparaku, 2005). Uganda has 350 fish species but Nile perch (Lates niloticus) and tilapia (Oreochromis niloticus) remain most important making up 38% and 46% of the total respectively. The total amount of fish catch is 374,300 metric tons out of which 223,100 metric tons from Lake Victoria, 60,000 metric tons from lake Kyoga and 56,000 metric tons from lake albert. It can be consumed in several forms: fresh, dried, frozen, fermented, or brined, depending on consumer preference.

India is the second largest producer of fish in the world contributing 5.43% of global fish production. India is also a major producer of fish through aquaculture and ranks second in the world after China. The total fish production during 2015-16 is 10.79 million metric tonnes (DADF 2016-17).

The fishing industry, despite its importance, suffers from enormous postharvest losses, which are estimated at 35%–40% of landed weight (FAO, 2010). These losses have a profound adverse impact on fishing communities whose status and income often depend on post-harvest activities. Such losses also have a detrimental impact on the socio-economic life of the fishing communities and reduce the amount of animal protein available to large segment of the population. Since fish and fish products are perishable without any preservative and processing measures, it is imperative and essential to process and preserve fish in order to assure quality of product, health safety of the consumers, and reduce water to the barest minimum as much as possible in order to preserve the fish (Mada, 2013).

The primary processing of fish in organized processing industry involves processes like fish washing/ cleaning, cutting of fins, descaling, beheading, evisceration (removal of the viscera ie the internal organs of the body, especially those contained in the abdominal and thoracic cavities), deskinning, filleting, slicing of whole fish into pieces etc. The retailers carry out washing/cleaning, descaling, cutting of fins, and beheading operations with their indigenous tools just prior to sale.

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