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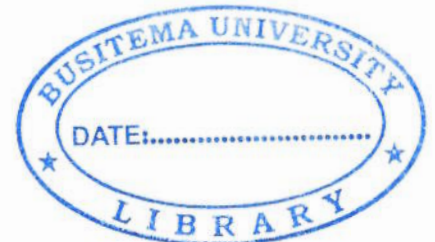
**DESIGN AND CONSTRUCTION OF MUSHROOM GROWTH MEDIA
STEAM STERILIZER MACHINE**

BY

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ABSTRACT

Mushroom is the one of the most world important fungi plants. The importance of mushroom is centered on the large quantity of Carbohydrates, protein, fibre and vitamins and fats making it comparable favorably as an energy source with cereals, animals' meat and root crops. Furthermore, mushroom is referred to as the fungi plant of its feature because of its medicinal values. Climatically, mushroom can be produced in most parts of the country although other mushrooms like button mushrooms require cool temperatures and only districts of Kabarole, kabale and Kisoro this was revealed when a survey of market for Ugandan produced mushrooms. Indoor mushroom growing under goes a series of processes which includes spawn production, substrate preparation, sterilization and inoculation. Sterilization is done to kill green molds and other organs that flourish at the temperature used to grow mushrooms. Many methods are being used to carry out sterilization process. However, effective demand for sterilization is gaining potential due to poor sterilization methods used which cause washing of nutrients, excess moisture content which affect the colonization of the substrates and they are tiresome. The aim of study was to design mushroom growth media steam sterilizer machine with increased efficiency and reduced time of sterilization.

Designing and constructing of the various components of the sterilizer machine involved determining the appropriate heater and also the pressure gauge and this was done to achieve the parameters. Engineering drawing was designed before the sterilizer was constructed and assembled. The performance of the sterilizer after construction was evaluated taking into consideration sterilizer capacity, effectiveness, biological efficiency and power requirement. The obtained results reveal that it is recommended to pack the substrate in not more than 5kg since the effectiveness of the machine reduced with an increase in weight. Therefore, it is recommended that, this sterilizer should be manufactured and popularized for adoption in Uganda and will help to reduce the demand for charcoal as well as increase profits to the mushroom growers.

DECLARATION

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

Signature..... 

Date..... 23rd MAY 2018.....



APPROVAL

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

Mr. Sserumaga Paul

Signature.....

Date.....

Ms. Engole Marion

Signature.....

Date.....

DEDICATION

This report is dedicated to my beloved Mum Makayla Joyce and brothers Saajja Micheal and Wanzala Henry in appreciation for their selfless care and unflinching support provided to me since childhood, and for the spirit of hard work, courage and determination instilled into me, which attributes I have cherished with firmness and which have indeed made me what I am today, To my Friends Kiyemba Eli Edward and Nalapa Festo. I also dedicate it to my pastors, John and Muwereza Micheal for the guidance that they have given me in all aspects of life, May the Almighty God reward you abundantly for such good work.

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May the Almighty God reward them abundantly

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CHAPTER ONE

1.0 Introduction

This chapter briefly describes the historical background of mushrooms, the problems encountered during sterilization and gives a justification for the design and construction of growth media sterilizer in order to reduce on the loss due to poor sterilization methods and this increase income for farmers. It also includes the objectives of the project and its scope.

1.1 BACKGROUND

Mushroom is the one of the most world important fungi plants (Khan and Tania, 2012) and (Holliday and Cleaver, 2008). The importance of mushroom is centered on the large quantity of Carbohydrates, protein, fibre and vitamins and fats making it compare favorably as an energy source with cereals, animals' meat and root crops (Gebregiorgis Amabye, 2015) Furthermore, mushroom is referred to as the fungi plant of its feature because of its medicinal values (Management and Hunting, 2014). Climatically, mushroom can be produced in most parts of the country although other mushrooms like button mushrooms require cool temperatures and only districts of Kabarole, kabale and Kisoro this was revealed when a survey of market for Ugandan produced mushrooms (Nick Shirra, 2003). Indoor mushroom growing under goes a series of processes which includes spawn production, substrate preparation examples of substrates include; wheat straw, banana leaves, banana pseudo stems, legume straws, paper pulp, potato foliage, rice straw, saw dust, rice husks, sorghum Stover, sugarcane bagasse, sunflower stypes, tea leaves, water hyacinth, wood shavings, barley straw, bean pods or straw, coconut fibre, coffee parchment, coffee pulp, coffee sawdust, corn fibres, corn cobs, corn stovers, cotton straw, cotton husks, grass, groundnuts shells.

, sterilization and inoculation. Sterilization is done to kill green molds and other organs that flourish at the temperature used to grow mushrooms. Many methods are being used to carry out sterilization process which include hot water, cooking 70- 90⁰c, natural compositing and steam sterilization (Foley and Yakushenko, 2012). However, effective demand for sterilization is gaining potential due to poor sterilization methods used which

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