

**EXTRACTION OF SUGAR FROM CORN (*Zea mays*) STALK USING CARABAO  
RUMEN FLUID HYDROLYSIS**

**MARIA SIMONNE T. OLIVERIA**

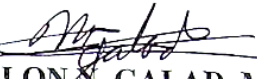
An Undergraduate Thesis Submitted to the Faculty of the Department of Agricultural and  
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**BACHELOR OF SCIENCE IN AGRICULTURAL AND BIOSYSTEMS  
ENGINEERING  
(Agricultural Mechanization and Renewable Energy)**


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**ACCEPTANCE SHEET**

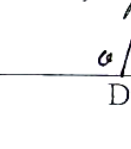
This undergraduate thesis entitled “**EXTRACTION OF SUGAR FROM CORN (*Zea mays*) STALK USING CARABAO RUMEN FLUID HYDROLYSIS**” prepared and submitted by **MARIA SIMONNE T. OLIVERIA**, in partial fulfillment of the requirements for the degree of **BACHELOR OF SCIENCE IN AGRICULTURAL AND BIOSYSTEMS ENGINEERING (AGRICULTURAL MECHANIZATION AND RENEWABLE ENERGY)**, is hereby accepted:

  
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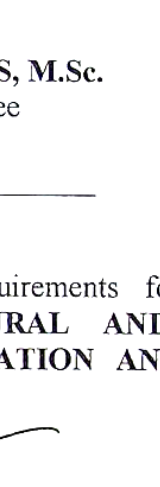
  
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## **BIOGRAPHICAL SKETCH**

Maria Simonne T. Oliveria was born on September 23, 1997 in Subic Bay Freeport Zone, Zambales. She is the fourth daughter in a family of seven children.

Her father, Emmanuel T. Oliveria runs a small family business together with his wife Angelita T. Oliveria. The two parents were both very supportive of the dreams their children aims to achieve.

The author began her study at the age of five and finished her elementary education at Divina Pastora College in Gapan City, Nueva Ecija, year 2010. She completed her secondary education at Juan R. Liwag Memorial High school in Gapan City, Nueva Ecija in 2014. She did everything she could to finish her Bachelor's degree in Agricultural and Biosystems Engineering at Central Luzon State University.

The author was able to complete this study with the help of her very supportive and helpful parents and siblings, and with the knowledge and skills her adviser and members of the advisory committee shared to her. She doubted that she could finish her study in time to graduate this year but she never lost her trust in God, she followed the advice her parents always gave her when encountering difficult situations which is to pray and never let her faith in God waver.

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## ABSTRACT

**OLIVERIA, MARIA SIMONNE T.**, Bachelor of Science in Agricultural and Biosystems Engineering, Department of Agricultural and Biosystems Engineering, College of Engineering, Central Luzon State University, Science City of Muñoz, Nueva Ecija, Philippines. **June 2019. EXTRACTION OF SUGAR FROM CORN (*Zea mays*) STALK USING CARABAO RUMEN FLUID HYDROLYSIS**

Adviser: MARLON T. DELOS SANTOS, M.Sc.

This study aimed to extract sugar from corn stalk using 1%, 5%, and 10% carabao rumen fluid in the hydrolysis process for 3 days. Specifically this study aimed to extract fermentable sugar from corn stalk using enzymatic hydrolysis; determine the effect of different concentrations of carabao rumen fluid in the sugar concentration of the hydrolysate after the process of hydrolysis; and determine the amount of fermented sugar after the fermentation process. A 6 liter capacity plastic container was loaded with 300g of washed, sun dried, and shredded corn stalk, together with this is 6 g of urea, 3 L of water and the corresponding concentration of rumen fluid for each treatment, the hydrolysis process was done for 3 days. Yeast fermentation was conducted for 14 days at a room temperature. Evaluation for the sugar concentration of the hydrolysate of corn stalk using carabao rumen fluid shows that using 1%, 5%, and 10% CRF had significant effect on each other. Mean comparison shows treatment with 1% CRF had the lowest amount of sugar concentration or hydrolyzed sugar being 3.93°Bx and significantly different compared to 5% and 10% with corresponding sugar concentration of 4.63°Bx and 5.93°Bx, respectively. For the sugar concentration of the hydrolysate after

fermentation, the treatment with 10% CRF has the highest amount of sugar converted to ethanol. 1% CRF has the lowest amount of remaining sugar after fermentation with a value of 1.43°Bx, followed by 5% CRF with 1.73°Bx, and 2.93°Bx for 10% CRF. In conclusion, carabao rumen fluid was a potential source of enzymes that may be used in extracting fermentable sugar from corn stalk that may be used in producing bioethanol, the 10% concentration of carabao rumen fluid was a potential concentration level to produce 5.93°Bx of sugar concentration from hydrolyzed corn stalk, and at 10% CRF the highest amount of fermented sugar or sugar reduction was obtained using 10g per liter of yeast.

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