

**DESIGN, FABRICATION, AND PERFORMANCE EVALUATION OF
CONTINUOUS FLOW COCONUT WATER CONCENTRATOR
FOR BIOETHANOL PRODUCTION**

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An Undergraduate Thesis Submitted to the Faculty of the Department of
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**BACHELOR OF SCIENCE IN AGRICULTURAL AND BIOSYSTEMS
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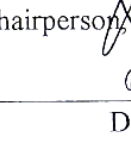
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ABSTRACT

DEL ROSARIO, KLARK KENT ROMEO TORRES, Department of Agricultural and Biosystems Engineering, College of Engineering, Central Luzon State University, Science City of Muñoz, Nueva Ecija, May 2019, **DESIGN, FABRICATION, AND PERFORMANCE EVALUATION OF CONTINUOUS FLOW COCONUT WATER CONCENTRATOR FOR BIOETHANOL PRODUCTION.**

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

The study dealt with the design, fabrication, and performance evaluation of continuous flow coconut water concentrator. The specific objectives were to design and fabricate a continuous flow coconut water concentrator; evaluate the performance of the concentrator in terms of concentrating capacity, time of concentration, fuel consumption, and efficiency; and perform simple cost analysis on the use of the concentrator.

The treatment used were the different rate of flow of coconut water which were $\frac{1}{4}$ valve is opened (8.43 cc/s), $\frac{1}{2}$ valve is opened (15.03 cc/s), and fully opened valve (24.36 cc/s). Data was laid out in Complete Randomized Design (CRD) Analysis of variance was used to analyze the effect of using different flow rate on the performance of the concentrator and comparison among means was done using Least Significant Difference (LSD) at 5% level of significance.

The performance of continuous flow coconut water concentrator in terms of capacity, efficiency, and fuel consumption was tested. It was observed that all the parameters were significant affected by the different flow rate. The best rate of flow is when the valve is set to $\frac{1}{4}$ opened or at 8.43 cc/s. It gave the highest capacity of 0.33 L/min, highest efficiency at 90.86%, and lowest fuel consumption of 20.67 kg.

The total investment cost is 10,948 Php. The total fixed cost was 3,021.65 Php/year and total variable cost was 58,812.2 Php/year. The projected total cost of the concentrator was 61,833.85 Php/year.

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