

**DESIGN AND CONSTRUCTION OF A SUGAR CRYSTAL GRADING
MACHINE FOR SMALL SCALE KAONG SUGAR PRODUCTION**

Undergraduate Thesis
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College of Engineering and Information Technology
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ABSTRACT

DE VERA, JAMICA MARIE R. Design and Construction of a Sugar Crystal Grading Machine for Small-Scale *Kaong* Sugar Production. Undergraduate Thesis. Bachelor of Science in Agricultural Engineering. Cavite State University, Indang, Cavite. April 2014. Adviser: Dr. David L. Cero.

The general objective of the study was to design and construct a *kaong* sugar crystal grading machine. The *kaong* sugar crystal grading machine was constructed and evaluated to determine the sugar particle size grading efficiency, grading rate and noise emission level during the operation. The range for coarse sugar particle size was greater than or equal to 1.68 mm, for moderately fine sugar particle size was less than 1.68 mm but greater than 0.59 mm and for fine particle size with 0.59 mm or less.

The developed *kaong* sugar crystal grading machine is composed of 8 major components; sieve, clamp, base plate, eccentric shaft to the base plate assembly, support rod, stand assembly, pulley and belt and power source.

The *Kaong* sugar crystal grading machine was tested using the crystallized *kaong* sugars. Four (4) different grading time were use; T1-one(1)minute, T2-two(2)minutes, T3-three(3)minutes,andT4-four(minutes).The grading rate of the machine was 463.33 g/min. The optimum grading duration time was two (2) minutes. The efficiency of grading the sugar crystals was based on their designated particle sizes,88.50 percent for coarse, 91.79 percent for moderately fine and 98.14 percent for fine. The efficiency of the whole machine performance was 92.40 percent and noise emission level was 92.96 decibels. The total cost of the machine was P54,045.00.