

**DESIGN AND CONSTRUCTION OF A CRYSTALLIZER FOR SMALL SCALE
KAONG SUGAR PRODUCTION**

Undergraduate Thesis Proposal
Submitted to the faculty of
College of Engineering and Information Technology
Cavite State University
Indang, Cavite

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of the requirements for the Degree of
Bachelor of Science in Agricultural Engineering

CLAUDINE MAY P. GOMEZ
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ABSTRACT

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The study was conducted from August 2014 to March 2014 at Cavite State University- SPRINT field office, Indang, Cavite, to design and construct a crystallizer for small scale *kaong* sugar production. Specifically the study aimed to: 1. document the process condition and variables of existing practices for crystallizing the *kaong* syrup; 2. construct a *kaong* syrup crystallizing machine based on design concepts; 3. evaluate the performance of the machine in crystallizing *kaong* syrup with three different types of impellers at two different levels of TSS of the syrup; and 3. determine the cost of the machine.

Three different impeller designs at two levels of total soluble solids (TSS) of the syrup were used to evaluate the performance of the machine. Preliminary field test was performed. Data collected were analyzed using the two-way ANOVA in a Randomized Complete Block Design and Tukey's Honest Significant Different Test.

The study yielded the following results: In terms of crystallization time, impeller 3 at 85-87 °Brix is the most time efficient, while impeller 1 at 80-84 °Brix was the least time efficient. In terms of production yield, impeller 3 at 80-84 °Brix can produce the highest yield of *kaong* sugar among other combinations. The crystallized *kaong* sugar using impeller 2 at 85-87 °Brix contains less moisture content among others. The impeller 1 at 85-87 °Brix and impeller 3 at 85-87 °Brix produced medium amber *kaong* sugar which is the known color of *kaong* sugar produced in manual operation. Lastly, in

terms of noise emission level, the performance of the three different designs of impellers at two levels of TSS of the syrup in producing crystallized *kaong* sugar was acceptable.