

# **STUDY THE FACTORS AFFECTING THE PRODUCTION OF GOOD QUALITY COPRA**

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(07/8210)



University of Moratuwa, Sri Lanka.  
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Degree of Master of Science in Sustainable Process Development

Department of Chemical and Process Engineering

University of Moratuwa

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November 2011

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Dissertation submitted in partial fulfillment of the requirements for the degree Master  
of Science in Sustainable Process Development

Department of Chemical and Process Engineering

University of Moratuwa  
Sri Lanka

November 2011

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Date:.....

Dr. A.D.U.S. Amarasinghe

Head

Department of Chemical and Process Engineering

University of Moratuwa

Sri Lanka.

## **Dedication**

This project is dedicated,

- to my Parents who have never failed to give me necessary support throughout my journey of life.
- to my teachers who were always behind me during my education.



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## Abstract

Copra is one of the major traditional products processed from coconuts and is used primarily as a source of coconut oil. It is the kernel of coconut after reducing the moisture content from 50% (wet basis) to 6% (wet basis) by drying. Traditional drying processes are vastly used in manufacturing of copra and that has created many quality problems leading to hygienic and health issues. Hence the coconut oil extracted from copra always is considered as a low value product in world market. Therefore, it is important to introduce cleaner drying methods with minimum quality problems to produce good quality copra.

A small scale, forced convection, solar-biomass hybrid drier was designed, fabricated and tested for drying copra. The dryer is consisted with solar air heater, biomass-stove heat exchanger and drying chamber. The biomass consumption was reduced by more than 60% when the solar air heater was in operation. The dryer was designed with 3 compartments to examine both single bed and multi bed drying characteristics of copra.

Good quality white copra could be produced from the proposed dryer. The multi bed drying was found to be more economical with higher thermal efficiency and lower specific moisture evaporation rate than single bed drying. The production rate of multi bed drying (0.74 kg/hr) was almost double the production rate of single bed drying (0.35 kg/hr). However single bed drying produced considerably high amount of white copra than multi bed drying.

At drying temperatures around 70 °C high fraction (about 80%) of copra became with brown in color. However by maintaining the drying temperatures lower than 60 °C more than 70% of white copra could be produced. Colorless coconut oil with good quality could be extracted mechanically by using both white copra and light brown copra obtained from hybrid drying.

Keywords: Copra, drying, white copra, multi bed drying, single bed drying



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