Studi characterizations of coconut (Cocos nucifera) oil extracted through wet and dry methods

Basuni Hamzah

Department of Agriculture Product Technology, Faculty of Agriculture, Sriwijaya University
Jl. Raya Palembang – Indralaya Km.32, Indralaya, Kab. Ogan Ilir, Sumatera Selatan
*Corresponding author: basuni_h@yahoo.com

Abstract

Historically, Indonesia had lots of coconut tree (Cocos nucifera) spreading almost all of the thousand islands, with famously named as 'negeri nyiur melambai'. Before the year of 1970-iest, in Indonesia, the people used coconut oil as the one of oil for frying foods. The people planted coconut tree intensively. Yet, after the year of 1970-iest, some new varieties of palm tree was introduced then the palm trees were planted extensively and intensively, the coconut oil was almost extinguished since then. Mostly now people use palm oil as frying oil. The use of coconut products now are only limited to meat and water of young coconut fruit and as some parts of food sauces. So, population of coconut tree is now drastically decreased. In this research was to study the possibility of prospective material of coconut oil as other than frying oil such as first-generation biodiesel feedstock. In the study, coconut oils were extracted through dry method and wet method. The coconut oil also was extracted through soxhlet method as reference of total coconut oil. Parameters used in the study were yield, relative density, iodine value, and saponification number. The data showed that coconut oil extracted through dry method has yield of 22.12%, relative density of 0.915 (40°C/water 20°C), iodine value of 8.5 WSIJ, and saponification number of 260 mg KOH/g oil. And, coconut oil extracted through wet method has a yield of 23.67%, relative density of 905 (40°C/water 20°C), iodine value of 7.5 WSIJ, and saponification number of 250 mg KOH/g oil.

Keywords: coconut oil, extraction, wet method, dry method.

Introduction

Coconut (Cocos nucifera) is one the most important crops grown in the humid tropics. More than 11 million farmers, mostly smallholders with low income, grow the palm in 90 countries. More than 80% of the total world production comes from the Asia–Pacific countries, which are near neighbours of Australia. Coconut also grows well in moist tropical regions of Australia, particularly northern Queensland. Plantations have been established in the past but the palm is now mostly used for ornamental purposes. Coconut is still used as the symbol of the Australian tropics to attract tourists from around the world to come on holiday in these regions.(Core, 2005)

Cocos Nucifera trees, otherwise known as coconut palm trees, grow abundantly along the coast line of countries within 15o of the equator. They prosper in sandy, saline soil and in tropical climates. A healthy coconut tree will produce approximately 120 watermelonsized husks per year, each with a coconut imbedded inside. There are three constituents of the Cocos Nucifera that can be used for fuel: the husk, the coconut shell, and the coconut oil that is in the white coconut “meat”, or copra as it is usually called. Thus, the coconut tree is a very abundant, renewable resource of energy. We have been investigating the production of energy from these three constituents of coconuts and their husks.

The coconut oil is in the copra, or white “coconut meat“, as seen in Figure 3. A typical coconut will have 0.36 kg of copra, including water, meal and coconut oil. Drying removes the 50% of the mass that is water, leaving 0.18 kg of dry copra, 67% of which is coconut oil, or 12kg. The most efficient extraction that can be done in a village using hand operated presses is 75% of this oil, or 0.09 kg/coconut. Coconut oil has a density of 890 kg/m3, or .89kg/liter. Thus, 0.1 liter of coconut oil can be produced from each coconut. The cost of the coconuts and the labor to process them in a rural village setting in Papua New Guinea is about $0.07/coconut, or $.70/liter. (Bradley et.al., 2006)

Coconut is the actual nut from the Coconut Palms: Coconut Palms are the most widespread tropical agricultural crops grown abundantly not only in PNG but all parts of the South Pacific and parts of Asia. It is naturally sustainable agricultural resource of tropical islands. Coconut Palms are one of the few crops that can tolerate poor sandy soils with saline water and survives frequent cyclones. Coconut Palms can bear a bunch of fruits each month for about 65 of their 70 to 80 year life span. Coconut Palms require minimum maintenance. Coconuts are and have been way of life for the