MENGKUDU SPREAD

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Mengkudu (*Morinda citrifolia*) is a tropical fruit found in South-east Asia, Australia, New Zealand, India, the Caribbean Islands, Hawaii and Tahiti. The fruit is commonly used in Malaysia as a traditional medicine and the leaves are consumed as a vegetable. In Indonesia, the fruits and the leaves are used as traditional salads. In Polynesia and Hawaii, the fruits have been traditionally used as medicine for more than 2000 years. It is also known by several names such as pain killer plant, headache tree and cheesefruit (Faur, 1996). Research has determined several medicinal uses for the fruit including providing relief from high blood pressure, menstrual cramps, arthritis, gastric ulcers, sprain, injuries, arteriosclerosis, drug addiction and relief from body pains (Hirazumi *et al.*, 1996).

Morinda fruit when ripe produces strong and unfavourable flavours, which makes it unpalatable for consumption. Several juice formulations have currently been commercialized which helps improve its acceptance. An experiment was conducted at MPOB to incorporate *Morinda citrifolia* in a fat spread. The main objective of this experiment was to mask the strong flavour of *Morinda citrifolia* to an acceptable level so that its health benefits could be conferred to those consuming this product.

RECIPE (*Morinda* 613)

In addition to ingredients commonly used in margarine, mengkudu spread also contains *Morinda citrifolia*. It contains natural oils and fats to enhance nutritional effects, yet fulfilling the requirements for preferred melting and solid profiles. Other ingredients include water (filtered and ultraviolet treated water) vacuum dried salt, emulsifier (distilled monoglycerides, 90% monoester and lecithin), flavouring agents, beta-carotene, vitamins A, D3, E, B1 and B2, preservatives and antioxidants.

PRODUCTION OF MENGKUDU SPREAD

Ingredients were mixed and emulsified in a tank. The emulsion was processed in a normal margarine plant to the desired product consistency *(Figure 3)*. The product was tempered at low temperature prior to shipment.

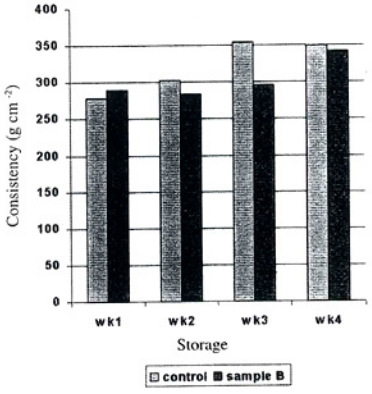

Figure 1. The consistency yield value in (g cm^{-2}) at storage temperature (23°C) at weeks 1,2,3 and 4.

THE PRODUCT

Mengkudu spread *Morinda* 613 was smooth and spreadable at 23°C. The consistency of the product, as shown in *Figure 1*, was comparable to any standard soft spread at the same temperature (Looney, 1975). The technology innovated was not only comparable to other products in the same class, but also able to mask the release of the natural flavours of *Morinda citrifolia*, thus encouraging indirect consumption of the beneficial qualities from the fruit *(Figure 2)*. The product contained fewer calories since the fat/oil was partially replaced by *Morinda*. Sensory evaluation by independent panellists *(Table 1)* showed that the product was acceptable to the consumer.

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ECONOMIC FEASIBILITY

Any existing commercial margarine plant can be used to produce mengkudu spread. No capital investment is required for its production; however, some funds are required for consumer education and promotion programmes.

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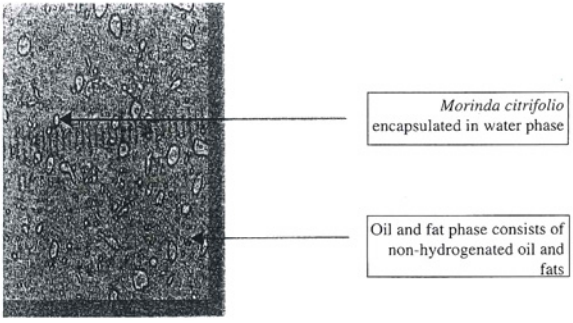

Figure 2. Photomicrograph showing the Morinda *pulp encapsulated by the margarine.*

TABLE 1. TASTE ATTRIBUTES OF *Morinda* SPREAD (means, standard deviations and medians) ASSESSED BY TRAINED PANELS

Sensory attributes	Means ± S.D
Appearance	6.93 ± 1.03
Colour	7.0 ± 1.13
Smell	7.2 ± 1.01
Spreadability	7.46 ± 0.91
Taste	7.26 ± 1.22

Note: value from 1-9 refers to from least to most acceptable.

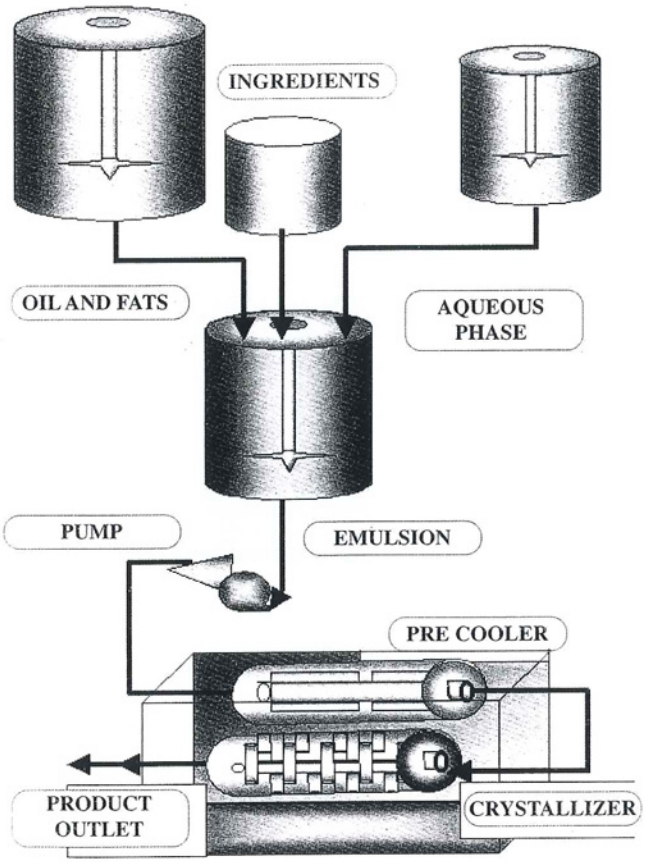

Figure 3. Process flow diagram of mengkudu spread.

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