# PALM-BASED GHEE-LIKE COOKING FAT

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his low in trans fat ghee-like cooking fat is formulated from palm fractions and other commercial fats (Figure 1). The ratio of its saturated, monounsaturated and polyunsaturated fatty acids is 4.4:3.7:1.0, an improvement to the ratio of natural ghee which is 25:8:1. The processing condition is unique and the product is spoonable in a tropical climate with temperature of >25°C. It retains its consistency of < 500 g cm<sup>-2</sup> at a room temperature of 25°C-28°C without significant hardening or separating for more than six months. The product is very similar to natural ghee, both in consistency and appearance, and has a pleasant flavour, making it a very suitable medium for cooking and frying, particularly in countries in the tropics and in West Asia.



Figure 1. Palm-based ghee-like cooking fats.

## **PRODUCT PROPERTIES**

The selected formulations for the production of ghee-like cooking fat have solid fat content profiles and melting properties similar to those of natural ghee. As shown in *Figure 2*, natural ghee and the selected formulations for ghee-like cooking fat show steeper slopes from 5°C–20°C, and more

gradual to horizontal slopes from 25°C-40°C. The shape of the slope indicates that the products have sharp melting properties from 5°C–20°C but retain their consistency from 25°C–40°C for spoonable property.

Figure 3 indicates that the palm-based gheelike product is consistently soft and spoonable throughout the storage period of 25 days, and it is predicted that there will be no significant increase in hardness during storage for the subsequent six months at 25°C. Fat crystals that make up the overall texture of the product are homogeneous in shape and size as shown in Figure 4.

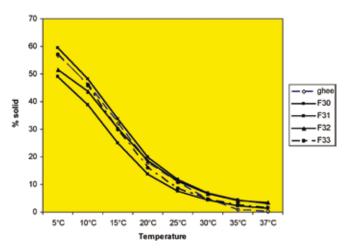


Figure 2. Solid fat content profile of natural ghee and ghee-like cooking fats.

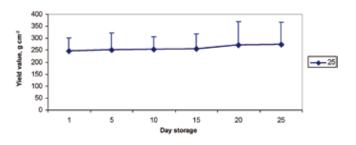


Figure 3. Consistency of the ghee-like cooking fats during storage at 25°C for four weeks.





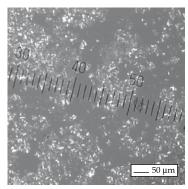


Figure 4. Crystal size and distribution of ghee-like cooking fat at 28 days storage at 25°C (magnification 10x10).

### **CONSUMERS ACCEPTABILITY**

The ghee-like cooking fat was tested for cooking *briyani* rice. The 20 sensory panellists who tested the cooked rice could not differentiate between the ghee-like cooking fat and natural ghee.

### **NOVELTY**

The formulation has succeeded in improving the fatty acid ratio of the cooking fat over that of natural ghee. The ghee-like cooking fat contains more monounsaturated fatty acid (40% oleic acid) compared to natural ghee that contains 72.8% saturated and 23.2% monounsaturated fats. The product also contains very little *trans* fatty acid (0.04 g/100 g) compared to the normal commercial vegetable ghee ( $\sim$ 17 g/100 g) and natural ghee (4.8 g/100 g). However it should be noted that the *trans* fatty acid present in the natural ghee is neutral.

#### **COMMERCIAL VALUES**

The expected capital investment of this technology for the basic production as shown in the process

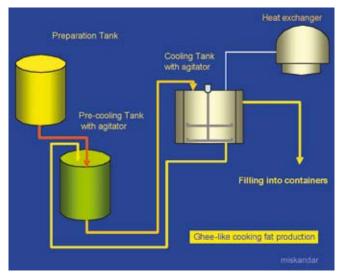


Figure 5. Process flow chart of ghee-like cooking fat.

flow chart in *Figure 5* is <RM 600 000. However, no capital investment will be needed for an existing margarine, shortening, vanaspati and ghee producer.

#### **ECONOMIC EVALUATION**

Price per kg RM 2.78 (RM 50 in 18 kg HDPE container)\*.

Cost of production per kg RM 2.62 (RM 47.12 in 18 kg).

Net present value = RM 100 742.

Internal rate of return = 26%. Payback = 3 years.

\*When price of RBD palm oil = RM 2100 and RBD palm olein = RM 2400.

#### **TARGET MARKET**

Palm-based ghee-like cooking fats will be a healthier alternative for vegetable ghee and, to a certain extent, natural ghee. Local and overseas users of vegetable ghee, wishing to use a cooking fat similar to a natural ghee, can now use the palm-based ghee-like product.

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