# SHORTSTIR (PALM-BASED CHICKEN FAT SUBSTITUTE)

MISKANDAR MAT SAHRI

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MPOB INFORMATION SERIES • ISSN 1511-7871 • JUNE 2010 MPOB TT No. 469

*Shortstir* is a palm-based chicken fat substitute formulated from palm fractions and other commercial fats. The ratio of its saturated, monounsaturated and polyunsaturated fatty acids is 4.8: 3.8: 1. This ratio is similar to natural chicken fat. As an improvement, the oleic acid content of *Shortstir* is higher while the lauric acid content is lower than chicken fat. The melting profile of the fat substitute is also very similar to that of natural chicken fat, thus ensuring similar physical properties (Haighton, 1976).

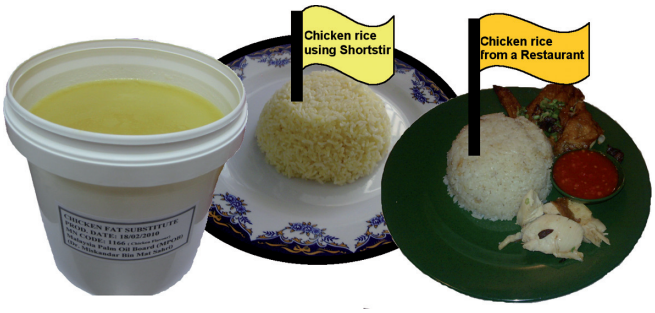


*Figure 1. Chicken rice using* Shortstir *and one from a restaurant.*

The processing condition is simple and cost-effective and therefore affordable to SME entrepreneurs (Lee and Singh, 1993; Miskandar *et al.*, 2002). The product will fluidize at tropical temperatures of more than 25°C. It maintains its consistency and homogeneity at a room temperature of 25°C - 30°C without significant hardening or separation for more than four months. The product has a pleasant chicken flavour, making it a suitable medium for cooking and frying (Kheiri, 1985). Just like chicken fat, it contains some solids at serving temperature (*Figure 2*) that provides the feeling of satiety on consumption. Application of *Shortstir* requires mere stirring into hot rice to produce the perfect chicken rice. Stir-frying with *Shortstir* would be the ideal cooking method for mixed vegetables whilst imparting a pleasant aroma to the dish.

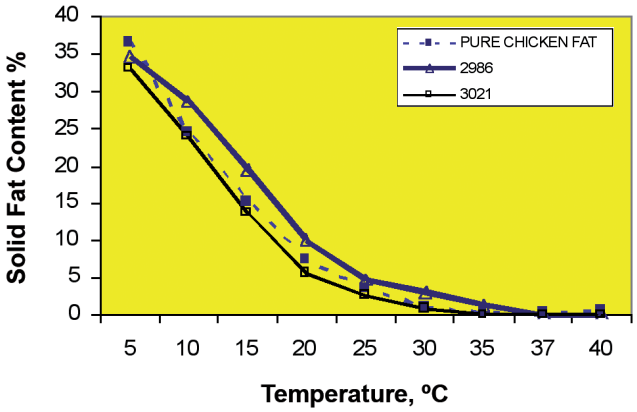


*Figure 2. Solid fat content profile of pure chicken fat and palm-based chicken fat substitutes.*

## PRODUCT PROPERTIES

The selected formulations for the production of *Shortstir* have solid fat content (SFC) profiles and melting properties similar to those of natural chicken fat. As shown in *Figure 2*, natural chicken fat and the selected formulations for *Shortstir* demonstrate steep slopes from 5°C - 25°C. Thereafter the slopes become gradual, and finally horizontal from 25°C - 40°C. The shape of the slopes indicates that the products have sharp melting properties from 5°C - 25°C. They start to melt at 25°C - 40°C, indicating the ability of the products to fluidize at this temperature range (Weiss, 1983).

The isothermal solid development trend of *Shortstir* as shown in *Figure 3* indicates that there is no significant increase in SFC during a storage period of 25 days at 25°C for various process conditions (Miskandar *et al.*, 2004). The result predicts that *Shortstir* will be consistently soft and fluid throughout the storage period of more than four months. Fat crystals that make up the overall texture of the product are homogeneous in shape and size as shown in *Figure 4*. The crystals are suspended in the liquid phase of the product, indicating the ability of the product to fluidize (Lawler and Dimick, 1998).

ISSN 1511-7871
9 771511 787001

Malaysian Palm Oil Board, Ministry of Plantation Industries and Commodities, Malaysia
P. O. Box 10620, 50720 Kuala Lumpur, Malaysia. *Tel:* 03-87694400 *Website:* www.mpob.gov.my *Telefax:* 03-89259446

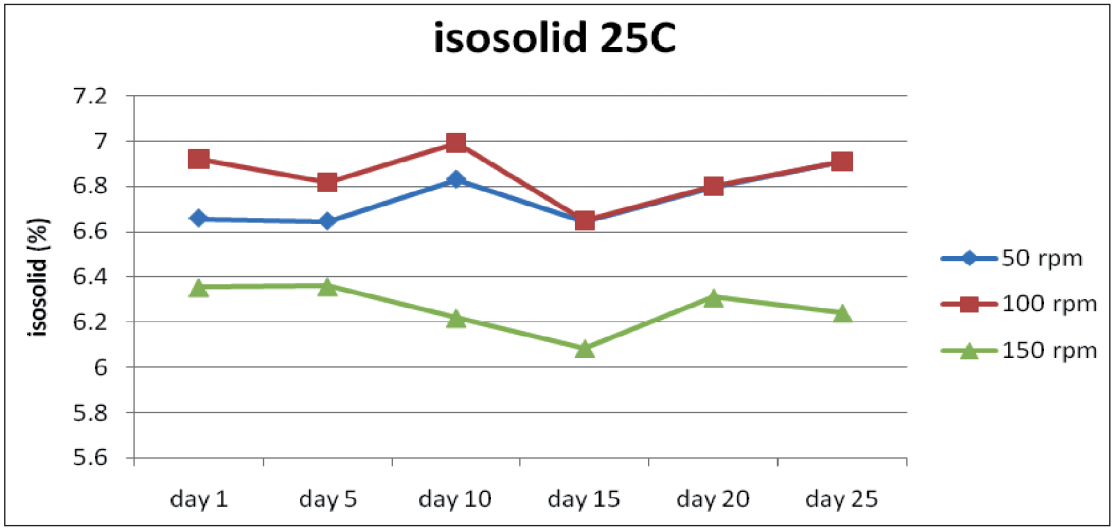


*Figure 3. Isothermal solid content of* Shortstir *during storage at 25°C for 25 days.*

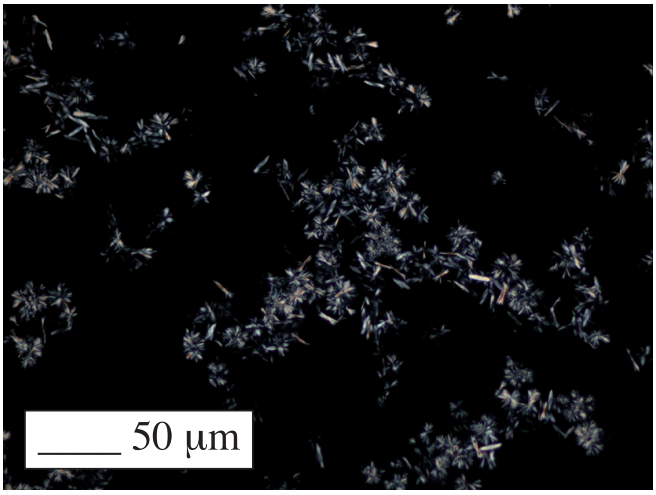


*Figure 4. Crystal size and distribution of* Shortstir *after 25 days storage at 25°C (magnification 50X).*

## CONSUMERS ACCEPTABILITY

*Shortstir* was tested for cooking chicken rice. The 20 sensory panellists who tasted cooked rice stirred with *Shortstir* preferred the test sample in comparison to the control.

## NOVELTY

The *Shortstir* formulation has successfully improved the fatty acid composition of natural chicken fat in containing more oleic acid (40.2%) in its monounsaturated fatty acid component than in natural chicken fat (containing 33.5%). The product contains a very small amount of *trans* fatty acid (0.04 g/100 g) which is contributed mainly by the liquid oil from a non-palm oil origin. Being a palm-based product, it contains as low as 0.2% lauric acid in comparison to 13% in natural chicken fat. The physical property, which is fluidizable at Malaysian room temperature, is a plus point for convenient cooking. The process condition is able to extend the homogeneity period of the product, ensuring improved palatability of fried food products (Miskandar *et al.*, 2004).

## COMMERCIAL VALUE

The expected capital investment of this technology for basic production as shown in the process flowchart in *Figure 5* is less than RM 300 000. However, no capital investment will be needed for an existing *vanaspati* and ghee producer.

## ECONOMIC EVALUATION

- Price per 16 kg in 16-kg HDPE containers = RM 59.30*
- Cost of production per 16 kg = RM 50.20
- Net present value = RM 105 561.00
- Internal rate of return = 19%
- Payback period = 3 years

*when price of RBD palm oil = RM 2255 per tonne and RBD palm olein = RM 2493 per tonne.

## TARGET MARKET

*Shortstir* will be a convenient cooking fat for use in many dishes, and can just be stirred into hot rice for the perfect rice with chicken flavour. Household cooking will be as convenient as when using liquid cooking oil, but *Shortstir* will provide the extra plus points for taste and texture. *Shortstir* is also a stable cooking fat, suitable for industrial frying of fish crackers, sliced tapioca and sliced banana.

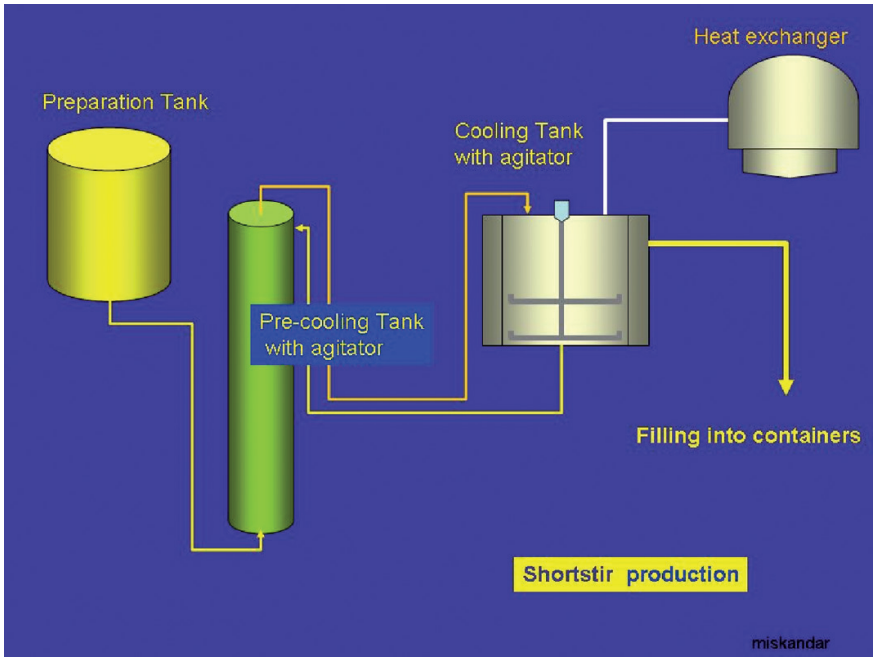


*Figure 5. Process flow chart for* Shortstir *production.*

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For more information, kindly contact:

Director-General
MPOB
P. O. Box 10620
50720 Kuala Lumpur, Malaysia.
*Tel*: 03-8769 4400
*Fax:* 03-8925 9446
www.mpob.gov.my