

PALM OIL-BASED FLUID SHORTENING AS AN ALTERNATIVE FOR TEMPURA OIL

by: **RAZALI I, MISKANDAR M S & BURHANUDDIN A S**

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Tempura oils are usually made of a soft oil such as soyabean oil or a blend of soyabean oil with other oils such as corn and sesame. In the temperate climate their appearance are clear, homogenous and can easily be poured or pumped. However they possess low oxidative and flavour stabilities and cannot endure repeated or prolonged heating. For example during frying of popular Japanese dishes such as Tempura and Kakiage, their utilization is limited to between two to three times before being discarded for other purposes.

Palm oil products such as palm olein because of its high oxidative and flavour stabilities can repeatedly be used at least five times for frying of Tempura and Kakiage. However its market niche in the temperate countries for household and institutional uses are limited because of cloudiness and solidification problems which make it less attractive and/or difficult to pour or pump.

FORMULATION OF PALM OIL BASED FLUID SHORTENING

The criteria in finding the suitable materials make-up were that as far as possible only palm oil products are utilized and the shortening(s) must remain homogenous, fluid and pourable at low temperatures for a reasonable time of storage. The characteristics of such a product (successfully produced recently) in comparison to a Tempura oil is as shown in *Table 1*.



PROCESSING CONDITIONS

Production was made using a pilot plant-scale "Perceptor" ammonia-chilled scraped surface heat exchanger made by Gerstenberg and Agger, Denmark. Hydrogenation, normally required for production of fluid shortenings from soft oils was found to be unnecessary.

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Malaysian Palm Oil Board, Ministry of Primary Industries, Malaysia
P. O. Box 10620, 50720 Kuala Lumpur, Malaysia. Tel: 03-89259155, 89259775. Homepage: <http://mpob.gov.my> Telefax: 03-89259446



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TABLE 1.

Parameter	Palm oil based Fluid shortening	Tempura oil
Colour (Lovibond, 5 ¼ in cell)	1.6R 18Y	0.8R 6.2Y
FFA (%)	0.04	0.05
PV (meq/kg)	0.89	1.13
Anisidine Value	1.76	2.14
Totox Value(2PV+AV)	3.54	4.4
Iodine Value(Wij's)	64.5	119
Total Tocopherol (ppm)	728	730
Oxidative Stability, 110°C	18	6.3
Smoke Point (°C)	232	238
Appearance	Opaque, Fluid	Clear, Liquid
Flavour (smell)	Bland	Bland
Homogeneity & Pourability, 20°C	Good	Good



ECONOMIC FEASIBILITY

It is economically viable to venture into production of these shortenings based on our comparable product prices and of those available in the respective niche markets. For the same outfit the production capacity of shortening is at least 33% higher than that for margarine.



ADVANTAGES

- Good oxidative & flavour stabilities
- Frying of Tempura & Kakiage can be repeated at least five times
- Imparts better taste to Tempura & Kakiage
- Convenience to handle & competitive price

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For more information kindly contact:

Director-General
MPOB

P. O. Box 10620

50720 Kuala Lumpur, Malaysia.

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Telefax: 03-89259446