HI-OLEIC SOFT SPREAD

MISKANDAR MAT SAHRI

480

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Diets rich in oleic acid (*e.g.* olive oil, which contains up to 80% oleic acid) are found to be able to reduce blood pressure. Researchers suggested that the reduction of blood pressure is due to the oleic acid's physical properties, namely, the *cis* configuration in the 18-carbon fatty acid that leads to significant differences in the fluidity of the membrane (Petkewich, 2008) (*Figure 1*).

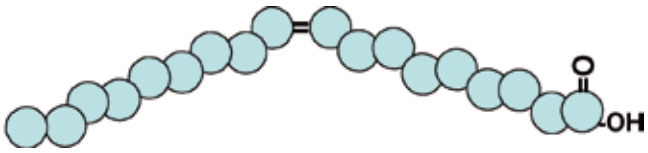

Figure 1. Oleic acid: monounsaturated fat molecule with 18 carbon, cis, *1 double bond.*

Hi-Oleic soft spread is a soft spread high in oleic fatty acid (C18:1) content and low in saturated fats (*Figure 2*). It is formulated from palm oil and a soft vegetable oil which is high in oleic fatty acid. There is no hydrogenation process involved in formulating the product.

Figure 2. Hi-Oleic soft spread.

The saturated fat content of this spread is as low as 10%-17%, or a maximum of 0.7 g per 5 g serving of the spread. The oleic acid contributes 70% of the total fat content. The saturated fat content is 50% lower than that of the American Heart Association (AHA) recommended formulations while the monounsaturated fatty acid content is 100% higher than the recommendations of AHA. Such a product is achieved by formulating selected oils and fats as well as having the appropriate processing condition to obtain the desired consistency (Miskandar, 2002a, b).

The processing condition is unique in that it is able to produce a spread with the desired spreadability on bread, without significant oiling out or presenting a greasy feeling on the tongue, despite the low saturated fat content and low solid fat profile (*Figure 3*). As the formulation has a very low saturated fatty acid content, Hi-Oleic soft spread should be kept refrigerated at 5°C-10°C so that the product will remain at a suitable consistency (< 500 g cm^{-2}). At this temperature, it will be stable for more than four months with no separation or hardening (Faur, 1996; Haighton, 1965). As the product is very similar to other high-end bread spreads in the market, in terms of consistency, taste and appearance, it is suitable to be marketed under high-end fat spread with healthier properties.

Consistency is a criterion used to determine the product stability during storage, performance and consumer preference. Of the two Hi-Oleic soft spread formulations, 1089 demonstrates a very consistent yield value during storage as shown in *Figure 4*. The texture graph in *Figure 5* shows a smooth line curve during cylinder penetration and retrieval, indicating that the spread is smooth through the entire range of the test (red region) with good spreadability. The consistency of the product is also demonstrated by its stability even after the 25th day of storage as shown in *Figure 6*. There is no significant oiling problem as shown by the homogeneous distribution of water droplets during storage at 5°C-20°C. Finally, it is the

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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

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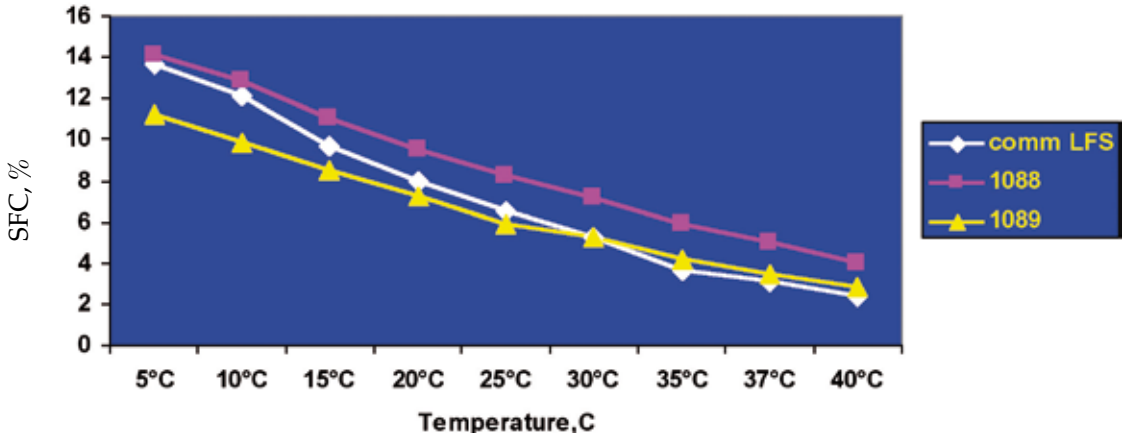

Figure 3. Solid fat content profile of commercial and Hi-Oleic soft spreads.

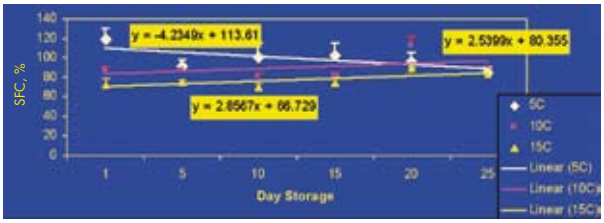

Figure 4. Penetration yield value of 1089, g cm^{-2} at 5, 10 and 15°C for 25 days storage.

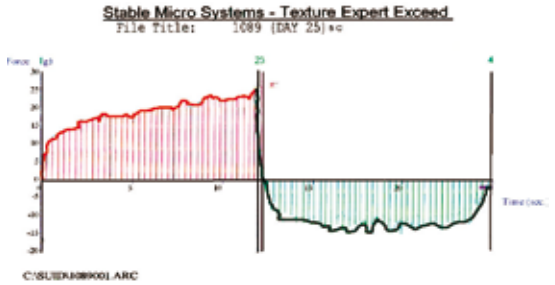

Figure 5. Texture of Hi-Oleic soft spread.

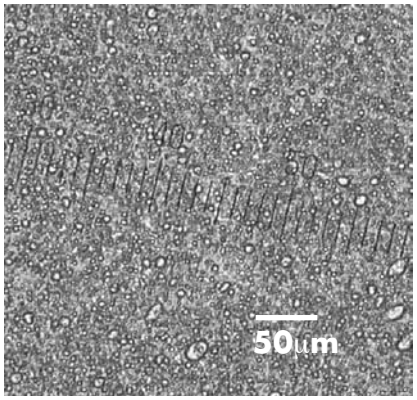

Figure 6. Water droplets distribution after 25 days at 10°C (1089). Magnification 10x10.

consumer who judges our product as shown in *Figure 7*. Twenty-five untrained sensory panellists chose Hi-Oleic soft spread formulation 1089 over a control soft spread sample from a popular brand.

NOVELTY

The formulation is low in *trans* fat (0.02 g per serving) and saturated fatty acid (0.61 g per serving), but high in oleic acid content (2.6 g per serving) (*Table 1*).

COMMERCIAL VALUES

The product is comparable to other high-end bread spread in the market in terms of consistency, taste and appearance. For a new processor, the expected capital investment of this technology is RM 6.5 million as shown in *Table 2*. However, no capital investment will be needed for an existing margarine and shortening producer.

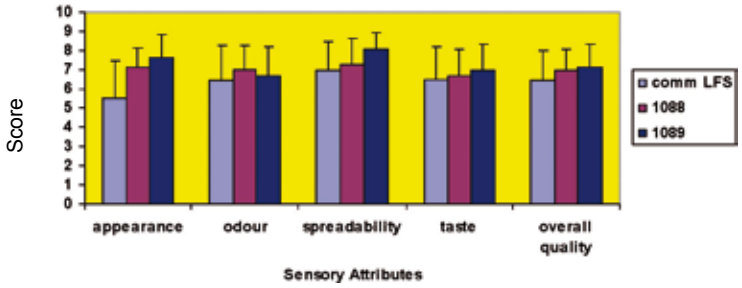

Figure 7. Sensory evaluation score data of commercial and Hi-Oleic spreads.

TABLE 1. FAT COMPOSITION OF COMMERCIAL AND HI-OLEIC SPREADS

	Commercial		Hi-Oleic spread	
	100 g	***Per serving**	**100 g**	***Per serving**
Total fat	54	-	72	-
Saturated fatty acid	10.6	0.53	12.4	0.61
Poly unsaturated fatty acid	13	0.65	6.5	0.32
Oleic acid	30	1.5	52.7	2.6
Trans	0.4	0.02	0.4	0.02

Note: *Per serving = 5 g.

TABLE 2. INVESTMENT OPPORTUNITIES

Item	Yearly
Production value @RM 2.80 per 250 g tub	RM 27 955 200
Production cost	RM 17 980 319.83
Profit per year	RM 9 974 880.17
Investment	
Capital investment	RM 6 150 000
NPV	**RM 19 207 507**
Breakeven	**3 years**
IRR	**23%**

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For more information kindly contact:

Director-General
MPOB
P. O. Box 10620
50720 Kuala Lumpur, Malaysia.
Tel: 03-87694400
Website: www.mpob.gov.my
Telefax: 03-89259446