# TRANS-FREE SOFT SPREAD (TF Soft Spread)

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trans-free Soft Spread (TF Soft Spread) has been formulated (Figure 1). The margarine is consistent, yet soft and readily spreadable on bread from the refrigerator at 5°C-10°C. It also maintains its consistency even when left at room temperature (23°C-25°C) for up to 4 hr.



Figure 1. TF Soft Spread.

There has been increasing demand for margarines with low saturates and trans by health conscious consumers. The saturated fatty acid (SAFA) content recommended is < 33% and trans fatty acids <1%.

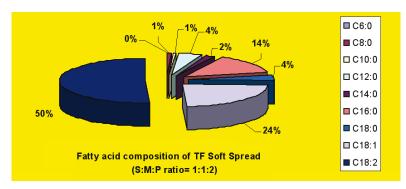
Reducing SAFA to <33% will normally compromise the physical product as SAFA contributes

to the structure or body of the margarine by affecting its solid fat content (SFC) which can be measured by nuclear magnetic resonance. Reducing SAFA will weaken the structure. Soft margarines with low SFC packed in tubs would also suffer from oil separation, graininess and greasiness. When a margarine is produced, it should be allowed sufficient crystal formation for the desired consistency during filling. This can be achieved by setting the crystallization temperature at 30% SFC. The storage temperature is another important parameter to manage for stability and spreada-bility of the margarine over time.

MPOB has, however, managed to produce a *trans*-free soft spread with low SAFA and high linoleic acid using a novel processing method.

## PRODUCT NOVELTY

Like any other normal soft margarine and butter, TF Soft Spread is for spreading on bread. Its reduced fat content (65%) gives it a lower calorific value. It is also carefully formulated as a healthy product free from *trans* fatty acids and containing <30% saturates and >50% linoleic (C18:2,  $\omega$ 6) (*Figure* 2). It is readily spreadable from the refrigerator, and maintains its spreadability and consistency for over 4 hr at room temperature (*Figure* 3).



*Figure 2. Fatty acid composition of TF Soft Spread* 996. Note: The blue portion of the pie chart indicates the linoleic acid part of the formulation.



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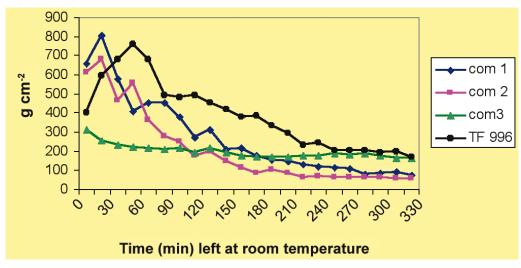


Figure 3. Spreadability of TF Soft Spread 996 and three commercial samples. Note: Spreadability was measured as soon as the product was taken out of the refrigerator (time = 0 min), measurement was taken every 15 min to 330 min at room temperature of 23°C.

## **PRODUCT CHARACTERISTICS**

As per the normal crystallization behaviour of margarines during storage (Faur, 1996; Miskandar *et al.*, 2002a, b), the product was unstable in the first week at 5°C to 15°C. However, it then stabilized with no significant (P<0.05) post-crystallization from the second week onwards. Storage at 5°C, 10°C, 15°C and 20°C did not cause any significant changes in the product hardness as measured by its yield value after the second week of storage (*Figure 4*). According to Haighton (1965), the yield

value of a good margarine with good spreadability should be 200 - 1000 g cm<sup>-2</sup>. *Figure 5* shows that the product has a stable and smooth texture without significant melting even after deformation. This is supported by the stable crystal development as shown in the photomicrograph in *Figure 6*. Crystals of the product were homogeneous in size and distribution, indicating that our novel processing method, MN996, had promoted effective nucleation that contained the crystal size to  $< 4 \, \mu m$  even after 25 days of storage.

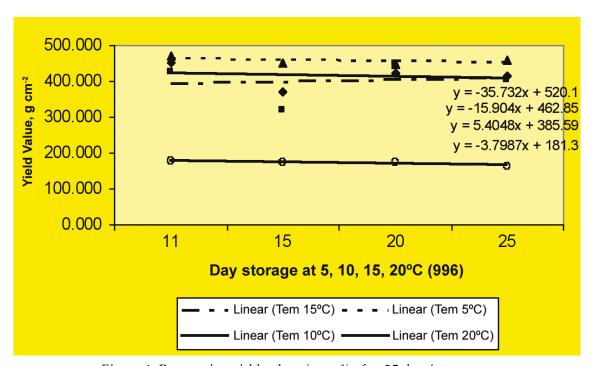


Figure 4. Penetration yield values (g cm<sup>-2</sup>) after 25 days' storage at 5°C, 10°C, 15°C and 20°C.

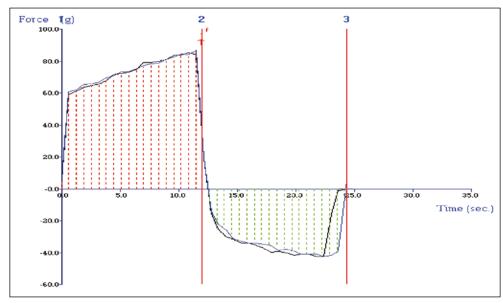


Figure 5. Texture of TF Soft Spread 996.



Figure 6. Photomicrograph of TF Soft Spread 996 after storage for 25 days at 15°C (magnification 10x10).

The product is usable straight from the refrigerator (5°C-10°C), spreads with a smooth texture and no oiling-off, making it highly acceptable by the 18 sensory panellists it was tested on (*Figure 7*). The sensory results show TF Soft Spread MN996 to be better than most of the well-known local commercial margarines.

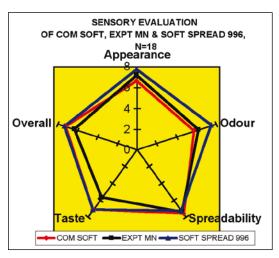


Figure 7. Sensory evaluation results for TF Soft Spread 996 and a commercial spread.

## **INVESTMENT RETURN**

Yearly	production
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Production volume (t)	2 496
Sales @ RM 2.80 per 250 g tub	RM 27 955 200
Production cost	RM 17 980 319
Profit a year	RM 9 974 880

### Investment

Fixed investment	RM	6 150 000
Operating cost	RM	8 990 160
Total investment	RM	15 140 160

NPV RM 19 207 507 Break-even 3 years IRR 23%

### **REFERENCES**

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