NON-LAURIC FATS FOR CREAM FILLING

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andwich cookies occupy a significant place in the world market for biscuits. Soft filling creams are widely used for filling sandwich cookies. The cream is either sandwiched between the cookies or between the wafer sheets. Multiple layers of cream can also be sandwiched between wafers. Cream biscuits may also be enrobed with chocolate or other coatings. Cream fillings will enhance the palatability of biscuits and wafers. Some applications of cream fillings are shown in Figure 1. Amongst the popular product brands are Oreo which is produced by Nabisco Biscuit Company and Tim Tam produced by Arnott's Biscuits Holdings.



Figure 1. Commercial applications of cream fillings.

The creams principally contain sugar, fat and flavouring. The fat content in the filling cream usually falls in the range of 25%-40%. The fat is carefully selected to give the cream some specific characteristics such as quick setting, firm at usage temperature and no leakages out from the sandwich. The cream should also have good melting properties in the mouth to avoid waxiness. The flavour can vary from indulgent flavours

such as vanilla, chocolate and hazelnut to fruity flavours.

DESCRIPTION OF THE PRODUCT

Filling fat was formulated through a blending and interesterification process using different fractions of palm oil to obtain the required characteristics. The cream filling was produced using 40% fats, sugar, emulsifier and flavour. The MPOB fats for cream fillings have several advantages:

- they have reduced saturated fatty acids;
- being non-lauric-based, they are not susceptible to hydrolytic rancidity;
- non-hydrogenated fats are used;
- they do not contain trans fatty acids;
- they have a fast rate of solidification (*Figure 2*); and
- they are bland in flavour, facilitating the addition of any flavouring agent.

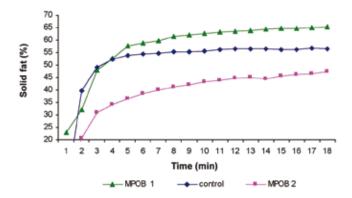


Figure 2. Rate of solidification of MPOB and control fats at 20°C.

CHARACTERISTICS OF CREAM FILLING MADE FROM MPOB FATS

As the MPOB fats have enough solid fat, they will solidify at a faster rate to give good characteristics for cream fillings. Good quality cream fillings can be produced using MPOB fats as they are able to

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satisfy the following criteria:

- the cream is smooth and creamy (*Figure 3* and *Table 1*);
- the cream solidifies sufficiently rapidly after spreading, and the two biscuit shells are held together firmly to prevent possible damage during transportation and packaging (Figure 4);



Figure 3. Smooth and creamy cream filling.



Figure 4. The cream is stable when sandwiched in between biscuit shells.

• the cream is firm enough (*Figure 5*) at ambient temperatures to hold the two biscuit shells together and yet avoid being squeezed out of the sandwich;



Figure 5. The peak of the cream does not collapse showing that the cream is stable at 30°C and at room temperatures.

- the cream gives a firm bite yet melts quickly in the mouth to give a cool sensation to the palate and release the sugar and added flavouring (*Table 1*); and
- the cream melts readily leaving no waxy aftertaste.

The creaming power of the product was 1.1-1.2 g cm⁻³ as compared to the control which was 1.1-1.5 g cm⁻³. The required creaming power is 0.75-1.15 g cm⁻³. The graphs for hardness during storage at 20°C and 30°C are shown in *Figure 6*. There was no significant increase in hardness during storage, indicating that the occurrence of post-hardening was minimal.

TABLE 1. SENSORY SCORES FOR MPOB AND COMMERCIAL CREAM FILLINGS

Sample	Smoothness	Melting property	Creaminess
MPOB 1	5.4ª	5.5 ^b	6.7 ^a
MPOB 2	5.2 ^a	5.3 ^b	5.6 ^{ab}
Comm 1	5.9 ^a	5.1 ^b	5.9 ^{ab}
Comm 2	5.1 ^a	7.1 ^a	4.9 ^b

Notes: Comm = commercial sample.

Means within a column with the sample which are not significantly different from one another (p. < 0.05).

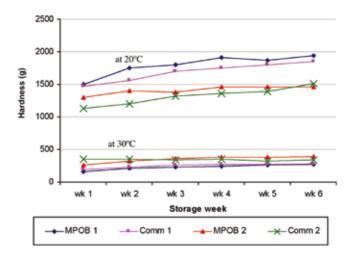


Figure 6. Hardness of cream filling made with MPOB fats and commercial samples during storage at 20°C and 30°C.

SENSORY PROFILE OF CREAM FILLING

Sensory scores for cream fillings made with MPOB fats were not significantly different (p<0.05) from commercial cream fillings in terms of smoothness,

melting property and creaminess (*Table 1*). The scores also showed that the non-lauric-based filling fats (MPOB 1, MPOB 2 and Comm. 2) were as well received as the lauric-based filling fat (Comm.1).

MARKET POTENTIAL

Biscuits are one of the main high-end processed foods. In USA, the total value of shipments of cookies and the cracker manufacturing industry amounted to USD 10.3 billion in 2000. The leader in the industry is Nabisco Biscuit Company which sold the top 10 cookies worldwide with the sales amounting to USD 1.8 billion for the first half of 1999. Its products include *Oreo* chocolate sandwich cookies, which is the world's largest selling cookie brand.

China is the third largest market for biscuits after USA and India. The highest product share was held by sandwich biscuits at 20% share in 2005. The popular types of biscuits include butter cookies and sandwich type cookies with chocolate, vanilla or strawberry fillings.

In Malaysia, biscuit production was 107 017 t valued at USD 109.3 million in 1997. The industry continues to grow in line with upgrading the

product image in order to compete in local and overseas markets. Local biscuit production includes cream crackers, oatmeal and digestive chocolate-coated cream sandwich biscuits and other assorted biscuits. The industry is dominated by four major brand-driven companies, namely Britannia Brands, Hwa Tai Food Industries, Perfect Food Industries and Khong Guan Biscuit Factory. Besides catering for local consumption, they also export their biscuits to West Asia, Australia, Canada, UK, Southeast Asian countries, Russia and Japan. The biscuit industry continues to grow with many local producers producing unbranded biscuits targeted at the low-end market while the high quality branded products are exported. This indirectly reflects the increased use of ingredients for making biscuits, including the cream fillings which are widely used for sandwich biscuits and wafers.

In line with the increased health awareness of the risk of using *trans* fatty acid fats and high saturated fats, the MPOB fats for cream fillings can be the best choice for our discerning consumers. MPOB fats offer *trans* fatty acid-free and lower saturated fats for cream fillings unlike the lauric acid-based fats.

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