

# PALM-BASED BAKERY FATS FOR CRUMBLE PASTRY

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**B**akery fats are used in a variety of bakery applications for specific functions to produce different products (Figure 1). The properties can be tailor-made to suit the application for which it is intended. A fat for crumble pastry should have a certain consistency to facilitate mixing of ingredients together. It should be able to coat the starch granules to make the dough tender and crumbly. The amount of fat and the method of mixing must be adapted to each kind of pastry. A crumble pastry consists of a crust or base and a fruit filling which is topped with a mixture of fat, sugar, flour and baking powder forming the crumble (Figure 2). The bakery fat is used to make both the base and the crumble.

Bakery fat for crumble pastry can be made with palm products. The fat may contain both beta and beta prime crystals. Palm stearin can



Figure 1. A bakery fat.



Figure 2. Crumble pastry made with palm-based bakery fat.

be incorporated to give beta crystals which contribute to the crumbly texture of the product. Beta prime crystals help in stabilizing some air cells formed during mixing of the base ingredients, and thus contribute to the product structure. A bit of aeration is necessary so that the base is not too compact in order to give a desirable tender and crumbly texture.

## CHARACTERISTICS OF BAKERY FATS

Figure 3 shows solid fat content profiles of selected bakery fat formulations. Between 20°C to 35°C a common range of usage temperature, the fats contain between 10% to 25% solids. The solids are necessary to provide the desired texture and structure to the end product.

Consistency of the bakery fats can be determined using a penetrometer. The results are converted to yield value which indicates how soft or how hard



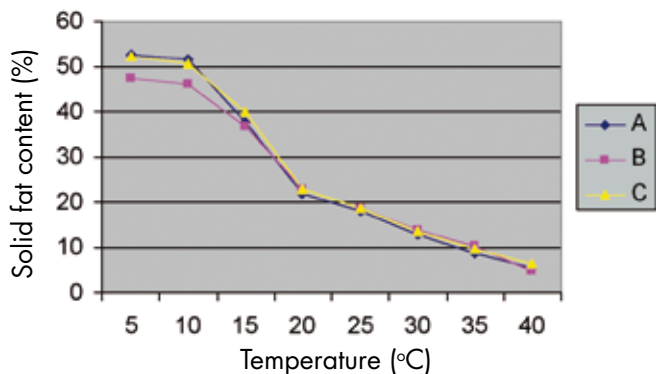


Figure 3. Solid fat content profiles of bakery fats.

a product is. The higher the yield value, the harder is the product. A recommended yield value for a fat intended for crumble pastry is between 300 to 1000 g cm<sup>-2</sup> and the selected bakery fats showed values within this recommended range (Figure 4).

### NOVELTY

The bakery fat formulated has good physico-chemical properties and it is a good alternative to butter as a bakery fat for making crumble pastry. This product meets the requirements of the health-conscious consumers who prefer cholesterol-free as well as *trans*-free food products.

### COMMERCIAL POTENTIAL

Economically feasible for industry currently in the production of margarine and shortening to add on to their range of product.

For a newcomer to this business, Table 1 shows the benefit cost analysis of three palm-based shortening formulations coded as A, B and C.

Based on the viability parameters, all palm-based shortening formulations are found to be viable at the same selling price, *i.e.* RM 3 per kg. Due to different cost of productions, the viability parameters show different outcomes. However, formulation C shows higher viability with the

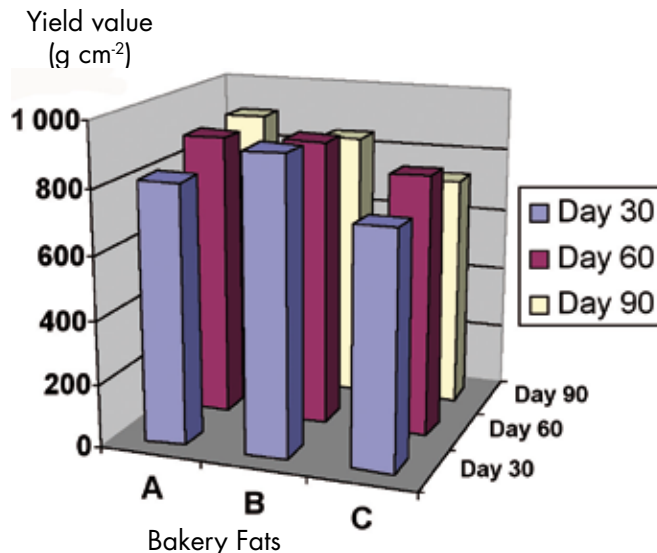


Figure 4. Yield value (g cm<sup>2</sup>) of bakery fats.

TABLE 1. VIABILITY PARAMETER

Formulations	Cost of production (RM per kg)	Discount rate at 10%	
		NPV (RM)	B:C
A	2.45	806 132	1.22
B	2.97	28 967	1.01
C	2.02	14 32 877	1.48

highest net present value (NPV) and benefit cost ratio (BCR) compared to other formulations. Its NPV and BCR are RM 1 432 877 and 1.48 respectively.

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