PALM OIL BASED SHORTENINGS

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INTRODUCTION

Shortenings are used for frying and baking. Commercial frying operations require that the fried products have a good shelf life. Since the fat in fried products has a large surface area that is exposed to air, it is susceptible to oxidation and this will cause the products to become rancid. For this reason, the use of polyunsaturated oil which is not hydrogenated is discouraged. However, unhydrogenated palm oil is very beneficial to be used as a frying shortening because it is very stable. Palm oil owes its good oxidative stability to its composition: it contains only a trace of the unstable linolenic acid but a moderate amount of the more stable linoleic acid. The tocopherol (380–890 ppm) in palm oil acts as a powerful antioxidant.

Bakery shortening can be tailor-made for different applications. These are cake shortenings, shortenings for cookies, short pastry, puff pastry, breads, cream fillings and icing. All purpose shortenings are used for several applications; for example, the same shortening may be used for making cakes, cookies, short pastries, icing and for frying.

APPLICATIONS OF PALM OIL IN SHORTENING FORMULATIONS

In formulating shortenings, oils and fats may be derived from vegetable, animal or marine sources. *Table 1* shows some of the possible ingredients for shortenings. The ingredients can be divided into three categories. One or more ingredients(s) can be combined from each group to make a shortening.

TABLE 1. OILS AND FATS FOR SHORTENINGS

Liquid Oils	Semi Solid Fat	Hard Stock
Palm olein oil	Palm oil	Hard fraction from palm
Palm kernel olein	Butter oil	Hard fraction from butter oil
Sunflower	Marine oil, hydrogenated	Hard fraction from beef fat
Soya bean	Lard	Any hydrogenated oil or fat of melting point 40°C upwards.
Low erucic acid rapeseed	Any vegetable oil hydrogenated to 32-34°C	
Cottonseed		
Corn		
Ground nut		

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TABLE 2. PALM BASED SHORTENINGS FORMULATIONS

Formulation	1	2	3	4	5	6	7
	Percentage						
Palm oil	40						
Anhydrous milk fat	60						
Hardened palm oil (m.pt. 42°C)		18					
Palm stearin		42	50	60	60	60	
Low erucic rapeseed oil		40	50	40			
Soybean oil					40		
Cottonseed oil						40	
Interesterified palm olein							100
Baking test (cake volume as percent of standard)	99	101	101	97	96	95	99

Many palm based formulations have been extensively examined in the experimental bakery in PORIM. *Table 2* gives some of the formulations that have been tested. The standard shortening used in the baking test was an imported product, and was selected based on its superiority to other available brands. The results obtained for the palm based shortening are comparable to the high quality standard shortening.

Shortening is used as an ingredient in cake-making (*Figure 1*). It is also used to make the icing for cake decoration (*Figure 2*).

< *Figure 1. Palm based shortening used as an ingredient in cake.*

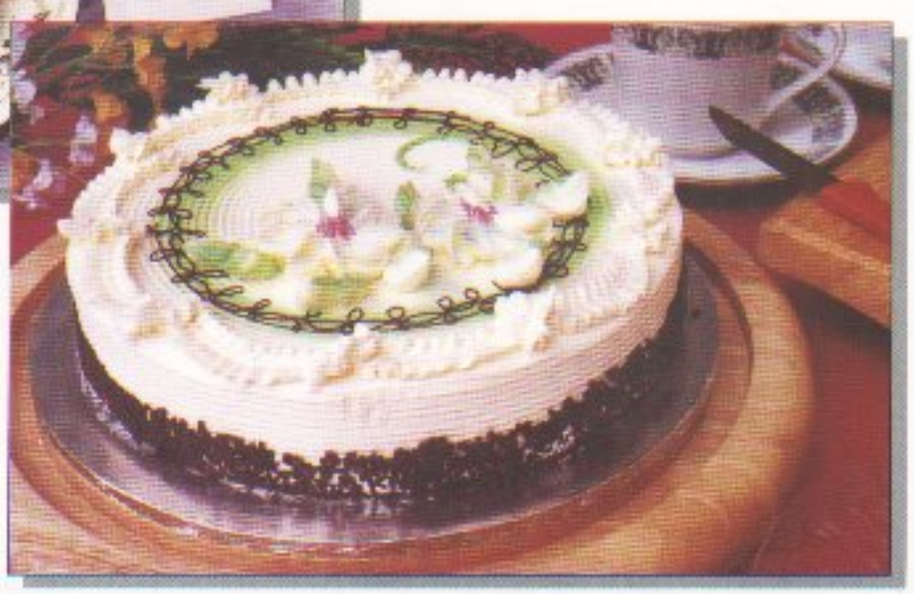

Figure 2. Shortening used in icing for cake decoration. >

Besides cakes and icing, shortening is also widely used in the manufacture of various types of cookies such as dropped cookies, pressed cookies, and moulded cookies (*Figure 3*). Shortening is the third largest component after flour and sugar. Addition of shortening to cookie dough contributes to lubricating function and gives the dough its required consistency. It contributes to the 'short' texture of the baked product, making it nice and fun to eat.

Figure 3. Cookies made with palm based shortenings.

Palm oil shortening is suitable to be used in making bread (*Figure 4*). The shortening improves the bread volume, improves the overall rating quality such as moistures and tenderness and extends shelf life of the finished product.

ADVANTAGES OF USING PALM OIL IN SHORTENING FORMULATIONS

1) At 20°C, it has 22%-25% solids and is a valuable ingredient for shortening formulation.

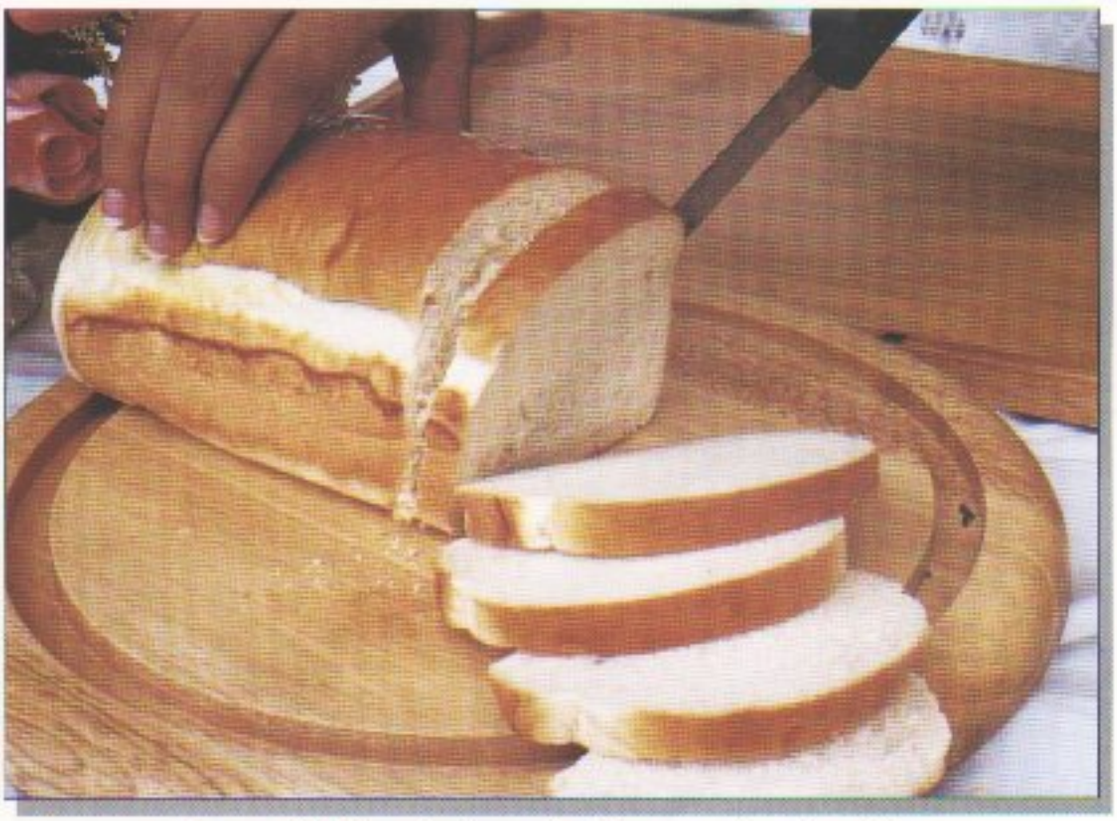

Figure 4. Palm oil shortening improves bread quality.

2) It stabilizes the shortening in beta prime' form, which is required for good performance.

3) It does not require hydrogenation, thus reducing processing cost as well as eliminating the formation of '*trans* fatty acid'. '*Trans* fatty acid' has become a nutritional concern due to its reported negative effects.

4) It is very versatile and can be tailor-made to suit a particular application.

5) It is very stable and has a long shelf life due to the presence of vitamin E which acts as a powerful natural anti-oxidant.

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