

PALM-BASED WHIPPED TOPPING

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MPOB INFORMATION SERIES • ISSN 1511-7871 • JUNE 2006

MPOB TT No. 324

Whipped topping is similar to other whippable emulsions, such as whipping cream and ice cream - they are all emulsions of oil-in-water. Creams are of three types - dairy, imitation and low fat. They are packed after either pasteurization or ultra high temperature (UHT) treatment.

Palm-based whipped topping (PT) was formulated similar to ordinary dairy cream (*Figure 1*). Its stability is satisfactory from the milk proteins and food emulsifier added. The main physical aspects of quality are the ease of whipping, amount of air incorporated (overrun) and extent of syneresis. Whipped topping is produced in liquid form, all ready for use.

INGREDIENTS AND FORMULATION

The oil used is a blend of fractionated palm-based products. The other ingredients are emulsifier, milk protein and water. A food emulsifier is added to prevent syneresis of the foam after whipping. This technology offers the oil blends for whipped topping up to product formulation.

PROCESSING AND PRODUCT CHARACTERISTICS

Dry and liquid ingredients are mixed with water and heated to 40°C in the processing vessel. The mixture is pasteurized and homogenized at 72°C for 30 min. The whipped topping is then filled into bottles. The whipped topping should be shaken well before use.



Figure 1. Palm-based whipped topping.

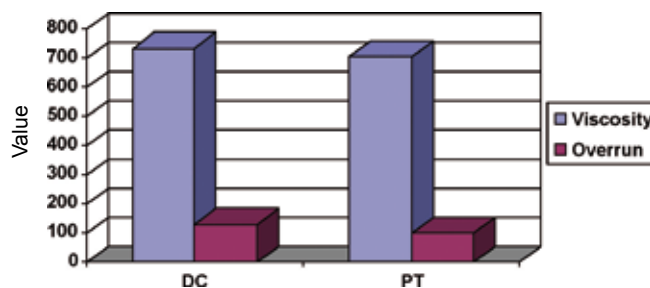


Figure 2. Viscosity and overrun of palm-based whipped topping (PT) and dairy cream (DC).

The viscosity and whipping performance (overrun) of whipped topping prepared from palm products and dairy cream (DC) are shown in *Figure 2*. Overrun was similar for all samples. Whipped topping prepared from palm products had a high viscosity compared to that of DC. The viscosity of the mixture is affected by the fatty acid chain lengths, unsaturation and solids content at 5°C.



A sensory evaluation of whipped topping prepared from palm products and DC is shown in Figure 3. Palm products received higher scores for appearance and mouth-feel than dairy cream. However, the commercial sample scored better in taste and odour.

Table 1 shows that PT is stable up to three weeks storage at 5°C, and is comparable to the commercial sample. The stability of palm products can be optimized by adding the right emulsifier and preservative and storing at low temperature.

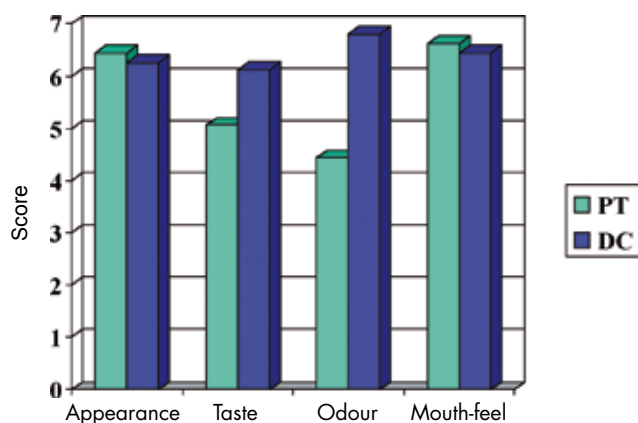


Figure 3. Sensory evaluation of palm-based whipped topping (PT) and dairy cream (DC).

TABLE 1. STABILITY OF PALM-BASED WHIPPED TOPPING

Stability at 5°C:			
	week 1	week 2	week 3
PT	Stable	Stable	Stable
DC	Stable	Stable	Stable
Stability at 20°C:			
	week 1	week 2	week 3
PT	Stable	Stable	Stable
DC	Stable	Stable	Stable

Notes: PT = palm-based whipped topping.
DC = dairy cream.

NOVELTY

The novelty of the product is the oil blend. The oil blend is *trans*-free, abundantly available, less expensive with the added advantage of being cholesterol-free. The product is to replace dairy cream and reduce the calorific content of desserts, beverages, cakes, ice cream and pastries (Figure 4).

The product has good functionality and whipping performance.



Figure 4. Cake decoration.

ECONOMIC EVALUATION AND COST OF PRODUCTION

The total investment for production of cream topping is estimated at RM 286 000. Producing 48 000 kg per annum and selling at RM 5.5 per kg, the venture will earn a pre-tax income of RM 84 955. The cost of production is estimated to be RM 4.23 per kg. Using a 10% discount factor and cream topping price of RM 5 per kg, the investment is attractive with a payback period of 5.3 years. The venture is expected to yield a benefit cost ratio (B:C) of 1.17, net present value (NPV) of RM 237 287 and internal rate of return (IRR) of 30.23%. As the B:C is greater than unity, NPV positive and IRR greater than the opportunity cost of capital, the investment is financially feasible.

MARKET POTENTIAL

The users of palm-based whipped topping are bakery specialists and catering services.

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