

# FROZEN CREAM PUFF

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**F**rozen cream puff has been widely commercialised especially in the USA, European countries and Japan. It is one of the popular ready-to-eat food products in these countries. However, frozen cream puff is almost non-existing in Malaysian market. Cream puff (Figure 1) is usually baked and consumed on the same day. On the shelf, it is stored in the chiller or refrigerator for up to 24 hr. Shelf-life of the cream puff shells can be extended by freezing. Baked cream puff shells can be frozen for 6 to 12 months in a plastic freezer bag.

Currently, commercial frozen cream puffs use butter as the fat source in the shell recipe and the whipping cream filling is commonly made of heavy cream. However, in this project, the cream puff shell is made of palm-based margarine and filled with palm-based whipped cream. Besides whipped cream, various filling creams can be used to suit the demand by consumers.



Figure 1. Cream puffs.

## METHODOLOGY

Cream puff shells and palm-based whipping cream were formulated to suit the application, where it should be stable during freezing and thawing (Calories in Costo Mini Cream Puffs, 2016; Cream Puffs and Eclairs, 2016; Long *et al.*, 2016; Moens, *et al.*, 2016; Nguyen *et al.*, 2015; Phan *et al.*, 2014; Zhao *et al.*, 2009). Texture of product was evaluated upon storage and sensory evaluations by 40 screened panellists were carried out.

## RESULTS AND DISCUSSION

Sensory evaluation was carried out using nine point hedonic scale for product attributes such as

colour, taste, texture and smell/aroma. Results of the sensory evaluation of the product showed that acceptance of the cream puff (with and without filling) were significantly influenced by the taste and texture of both the shell and fillings. Performance of the newly developed frozen cream puff shell for taste and texture was comparable to fresh and control samples (Figure 2). Chilled sample (stored at 5°C) was not acceptable by panellists after one week of storage. The newly formulated frozen cream puff with palm-based whipped cream (palm WC) was highly accepted by panellists compared to commercial and fresh cream puff samples (Figure 3). Texture of the product was maintained throughout the storage period in frozen state (Figure 4). Firmness after 30 min thawing at room temperature was found to be consistent.

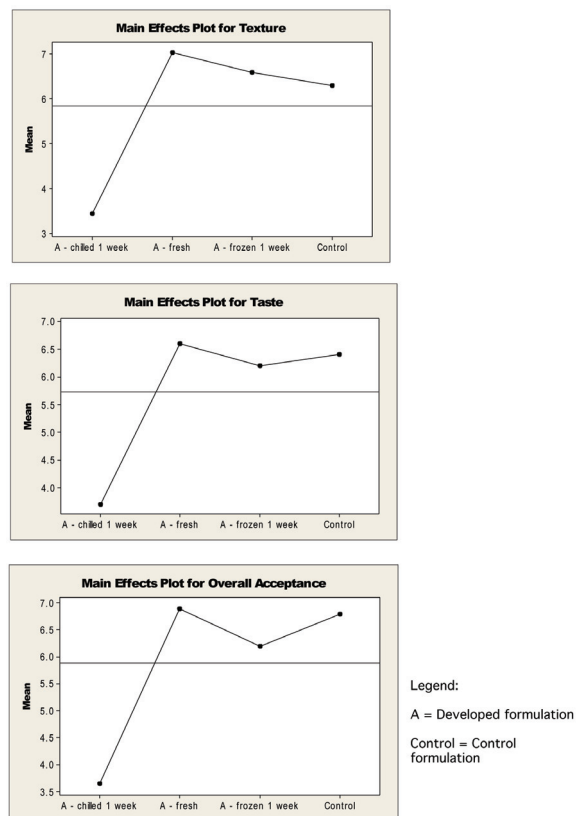


Figure 2. Performance of fresh, chilled and frozen cream puff shells: a) texture; b) taste; and c) overall acceptance.

## NOVELTY OF PRODUCT

The frozen cream puff is a ready-to-eat product that uses palm-based margarine and filled with



palm-based whipped cream. It can be further enriched with palm phytonutrients such as tocotrienol or carotene for value addition. It can sustain freezing storage temperature (below  $-18^{\circ}\text{C}$ ) for up to 6 to 12 months without preservatives. The cream puff shells can also be used for various fillings such as ice cream, custard and whipped cream.

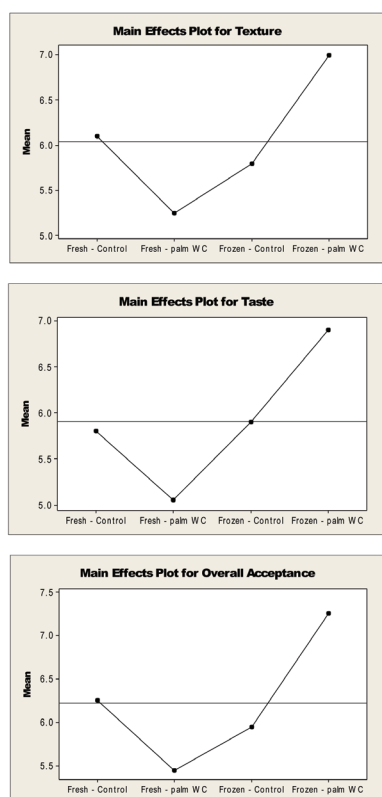


Figure 3. Performance of fresh and frozen cream puff with fillings: a) texture; b) taste; and c) overall acceptance.

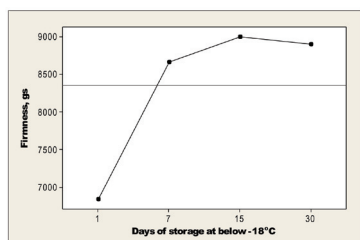


Figure 4. Firmness of the frozen cream puff during 30 days storage.

## ECONOMIC EVALUATION

The economic evaluation for this technology is shown in Table 1.

TABLE 1. ECONOMIC EVALUATION OF FROZEN CREAM PUFF PRODUCTION

Capital expenditure, RM	288 000
Cost (materials), RM per piece	0.40
Benefit to cost ratio	1:1.19
Payback period	Year 2
Internal rate of return (IRR), %	62
Net present value (NPV), RM	491 489
Return on investment (ROI), %	152

The economic evaluation is based on the assumptions that the frozen cream puff is sold at RM 0.60 per piece and the production capacity is 600 pack per day (one pack contains 12 pieces) for the first year with a gradual increment in sales over five years (Table 1). Current prices of frozen cream puff are RM 0.60-RM 6.15/piece depending on size and type of fillings. Fresh cream puffs are selling at RM 0.60-RM 2 per pieces.

## TARGET MARKET

Frozen food manufacturer, food caterer, cake house and bakeries are the potential target groups of the technology. The product has market potentials for both domestic and international markets.

## CONCLUSION

This product is an alternative to imported ready-to-eat frozen cream puff with a great market potential.

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