PALM OIL POURABLE MARGARINE

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ABSTRACT

Palm oil products blended with liquid oils were successfully used to produce a pourable margarine. The formulated blend was processed in a Schroeder Kombinator pilot plant using the holding method (Melmick,1969). Performance test on the products was based on their pourability, viscosity, spreadability and emulsion stability at various storage temperatures. This pourable margarine had performance characteristics at 23°C that were comparable to those of a commercial product. However, at lower storage temperature, it was desirable to reduce the content of palm oil products used in the formulation.

Palm Oil Pourable Margarine

INTRODUCTION

Margarine and butter are conventionally used in cakes, icings and fried products. They are also consumed with bread. Margarine is normally packed in cartons, cans, tubs or packets. Such packaging may sometimes prove inconvenient to the end user. A convenient way of using margarine in these products is therefore sought, that is, by squeezing or pouring directly into the product.

Just like conventional margarine, a pourable margarine contains 80% fat and 20% other ingredients. The oils and fats contained in the product are responsible for the behaviour of the entire product. They influence the polymorphic behaviour of the product. Thus, a pourable margarine formulation differs from the conventional ones, by having a higher amount of liquid oil (Haumann, 1990).

Palm oil and its fractions have long been successfully used in conventional margarine especially in industrial and household table margarine. Research has shown that it is also a good oil for pourable margarine. Palm olein, the liquid fraction of palm oil has been proven to be a good ingredient for the formulation of pourable margarine. The favourable physico-chemical characteristics of palm olein will produce the desired consistency required for a pourable margarine when processed in the correct manner.

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INGREDIENTS

A pourable margarine is a margarine in a fluid form . It has a higher amount of liquid oil and the solid fat content is below a defined level in order to maintain fluidity and to prevent emulsion break. An example of a formulation which produces such a desired product may use the following ingredients: palm oil, palm olein, soybean oil, sunflower oil, palm kernel olein, palm kernel oil, emulsifiers, water, salt, skim milk, stabilizers, vitamins, antioxidants, antimould agent, colouring agent and flavouring agents.

THE PROCESS

Fat blend and fat soluble ingredients were mixed thoroughly (A). The oil/fat phase was fed into the scrape surface heat exchanger for rapid chilling (B). The aqueous phase was added and mixed thoroughly into the oil/fat phase (C).The emulsion was then fed into the pin worker units (D), packed (E), tempered and packaged for shipment (Miskandar *et al.,* 1996).

THE PRODUCT

Pourable margarine of samples L and 364 showed short pourability time (*Figure 2*). Sample B however had longer pourability time that was comparable to the control sample. This pourable margarine (sample B) and the control were stable to mechanical activities such as pouring. They did not separate easily or form an oiling off. In comparison, samples L and 364 separated easily and increased the flow rate.

Sample B showed a stable and moderate viscosity comparable to the control sample (*Figure 3*). Samples L and 364 were slightly loose as indicated by their lower viscosity readings.

Emulsion test showed that sample L stored at 23°C broke into two phases on the seventh day of storage (*Figure 4*).The two phases returned to the original form when inverted a few times. This enabled the product to be poured cleanly out of the container. Thus, it becomes a convenient margarine for frying when filled in a proper packaging.

ECONOMIC FEASIBILITY

Pourable margarine can be produced by using the basic margarine production unit. A 1500kg/hour capacity plant requires an additional investment of RM 400,000.00 to be made compatible for producing pourable margarine. However, the same plant will be able to increase its production capacity to 1800 to 2000kg product.

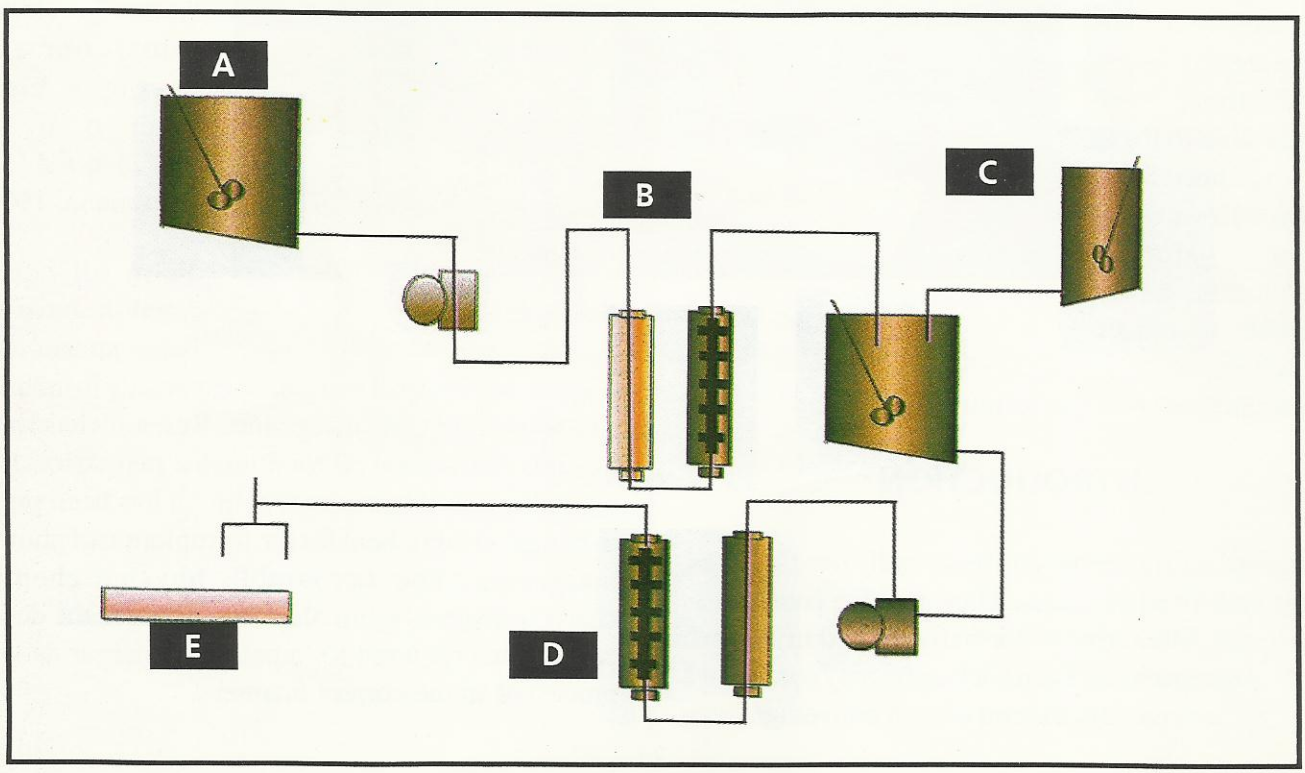

Figure 1. Flow chart of pourable margarine processing

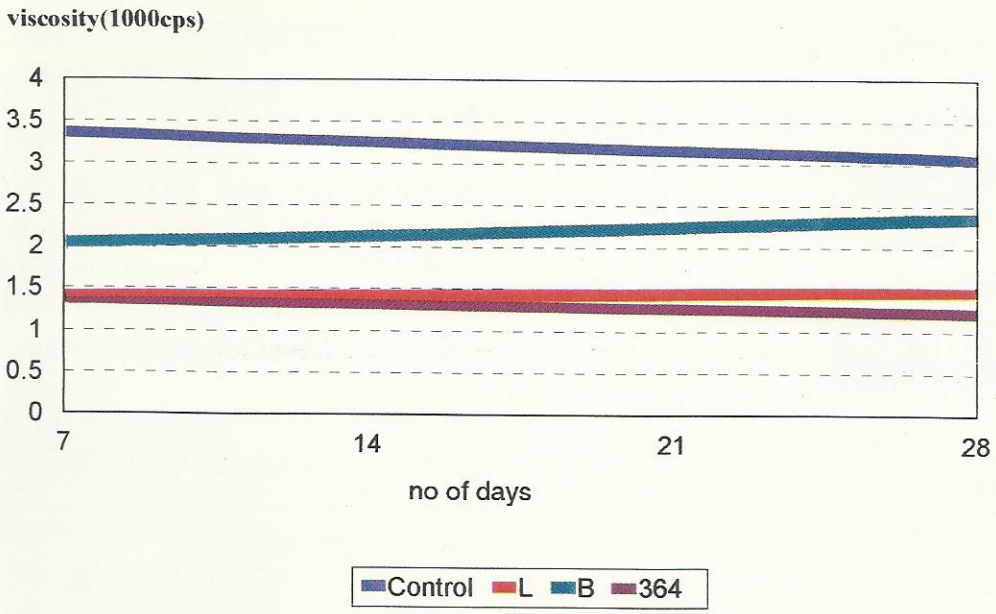

Figure 2. Viscosity (1000cps) of margarine stored at 23°C for 28 days.

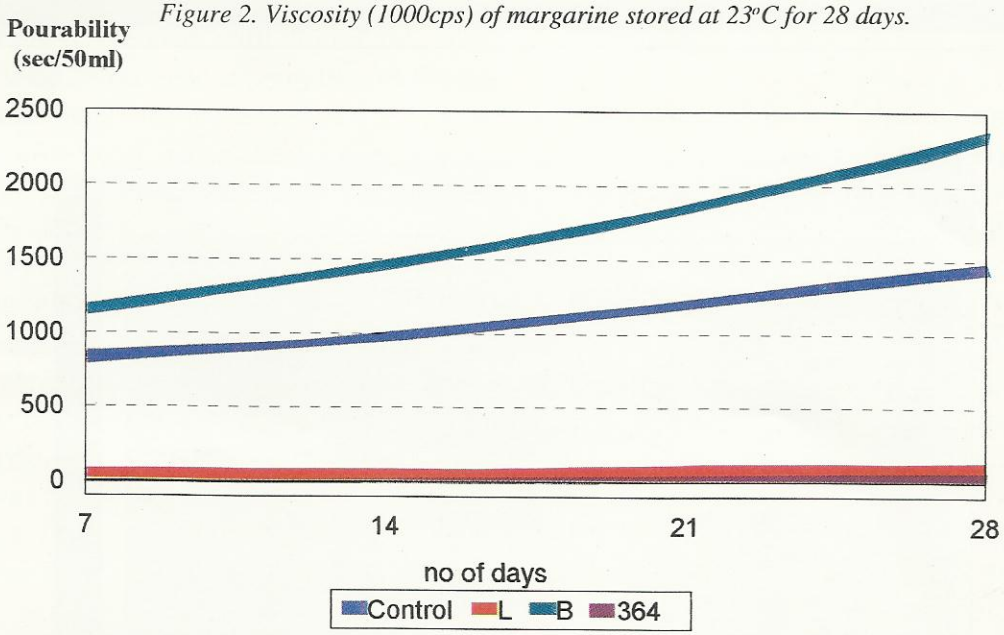

Figure 3. Pourabality (seconds/50ml) of margarine stored at 23°C for 28 days.

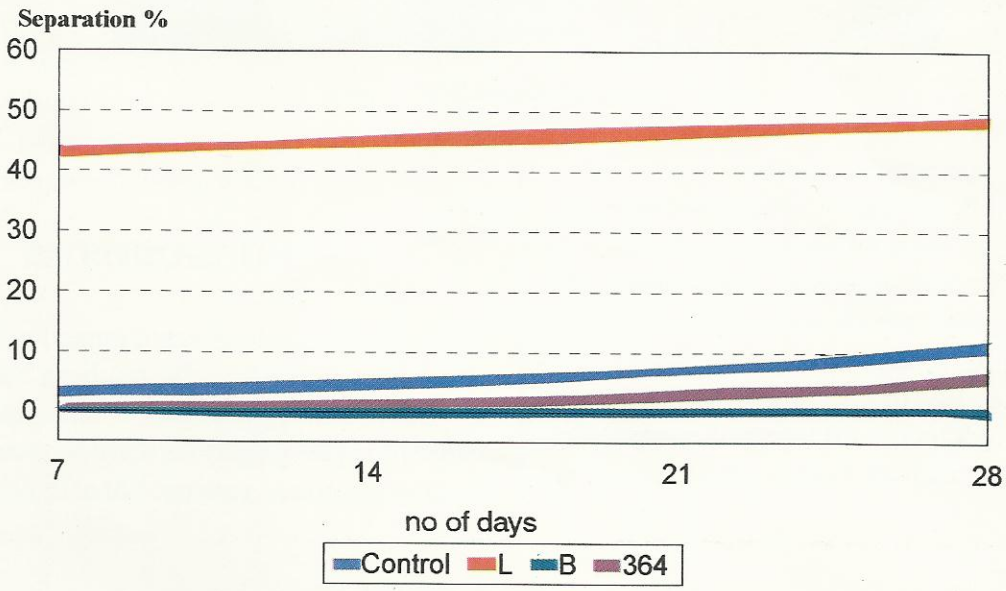

Figure 4. Emulsion separation (%) of margarine stored at 23°C for 28 days.

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