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THE EVALUATION OF MILK EXTENDERS IN UNRIPENED SOFT CHEESE

A thesis presented in partial fulfilment
of the requirements for the degree of
Master in Technology in Food Technology
at Massey University

Lucila L. Cruz

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ABSTRACT

Mixtures of soybean milk, coconut cream and reconstituted skimmilk were utilized in the manufacture of unripened soft-type cheese for the purpose of extending the milk supply. Different treatment combinations had been formulated replacing part of the reconstituted skimmilk used as milk base. The product formulation selected on the basis of product quality, stability and production costs analysis was that having low levels of soybean milk (10% w/w), coconut cream (20% w/w) and mixed starter culture (1% w/v) for acid development.

The sensory qualities of the resulting soft cheese were satisfactory although inferior to control cheese (fresh cow's milk). Compositional analysis showed that the experimental soft cheese is equally nutritious relative to soft cheese produced from cow's milk.

It was observed that the presence of soybean milk particularly at high level (20% w/w) resulted in high fat and protein losses, increased water-holding capacity and decreased firmness. The experimental soft cheese had the tendency to soften further and to develop an unacceptable acid taste during prolonged storage in cheese with a starter culture. Experi - mental soft cheese without starter culture had organoleptically good acceptance and good storage life at 5°C.

From the technological and nutritional standpoint, the use of milk extenders in combination for soft cheese manufacture is feasible and suitable for cottage industry. A major advantage is year-round availability regardless of fresh milk supply.

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INTRODUCTION

Soft cheeses can be made easily and profitably in small farms since less labour and capital investment is needed, besides being ripened quickly. Although this type of cheese cannot be kept longer due to its high moisture content, however, its high protein and the minerals present made it excel as a good source of nutrients for the human diet (FAO, 1970). As proteins have acquired special significance in the discipline of nutrition, they are essential food ingredients needed daily to promote growth and replace worn out tissues in the body. Fresh milk is the best source of these nutrients but it is not available to many particularly in developing, underdeveloped or non-dairy countries (Abou El-Ella, 1980).

With the increasing concern for improving protein quality and increasing protein content of many existing foods coupled with the rising prices of conventional protein-containing foods, an interest in relatively low cost, high protein products are given attention to simulate existing foods. Dairy products especially cheeses are very expensive in countries with seasonal, insufficient or non-existent local dairy industry. Fresh milk as the main raw material and considered the most complete and nutritious food is not available to many, hence

the use of milk extenders or even substitutes may be worthwhile to bridge the protein gap thereby combating the world's perennial problem - malnutrition.

In the Philippines, buffalo's milk or carabao's milk is the chief ingredient in making soft cheese locally known as "kesong puti" (white cheese). This cheese is normally eaten as fresh or within a few days of manufacture. It is one of the most saleable type of cheese as other cheeses are imported which are unaffordable by the pockets of the majority of the people. Another type of cheese dominating the local market is the processed cheese where the main raw materials used are also imported.

Buffalo's milk and/or carabao's milk has high solids content, (Alim, 1975), hence giving higher yield compared with cow's milk. The colour of the cheese produced is white due to the absence of carotene pigment which is present in cow's milk. Nevertheless, the product is still highly acceptable to cheese eaters despite the impression especially among the Westerners that cheese colour is creamy. However, the production of buffalo's milk or carabao's milk in the Philippines is very minimal relative to the demand on soft cheese production. The difficulty in supply yet the popularity of the product led to the idea of extending milk to develop similar product.

It is therefore the purpose of this study to assess the suitability of soybean milk, coconut cream and skimmilk powder

as milk extenders simulating the composition of buffalo's milk or carabao's milk in producing unripened soft-type cheese.

Specifically, the objectives of this project are:

1. To formulate a prototype product utilising the readily available raw materials such as soybean milk, coconut cream and skimmilk powder.

2. To develop and process an acceptable and nutritious product that best fits the low income consumer purchasing group.

3. To determine the acceptability for the prototype product.

4. To characterise the prototype product in terms of composition, sensory qualities and shelf life.

5. To evaluate the feasibility of production in terms of costs.

This study was conducted at the Pilot Plant, Department of Food Technology, Massey University, Palmerston North, New Zealand during the period from March 1988 to January 1989.