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Using Native and Modified Starch in Processed Cheese Analogue Manufacture to Reduce Cost

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Short Communication

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ABSTRACT

Cheese is one of the important by products of milk that is prepared by coagulation of the milk protein (casein). It is used mostly as a food additive in many of the preparations and produced in a wide range of flavors and textures. Processed cheese is an analogue of natural cheese that has been prepared from it after addition of many more excipients to it. In the last few years the prices of processed cheese ingredients are increased. Our present study is mainly done to reduce the cost of processed cheese by using native and modified starch. So we made several trials to reduce the processed cheese cost by adding different percentages of the two types of starch, native and modified starch and reduce the protein content. The processed cheese recipes were tested for taste, texture, dry matter and fat/dry matter. The results were as followed 5-6% native starch or 2% modified starch are applied successfully (good taste and texture). These recipes reduce the cost 40% because the protein content is about 4% -5% instead of 8-10%. These ingredients are the good solution for low cost processed cheese.

INTRODUCTION

Processed cheese is one of the most valuable foods known to man. Most countries need the cheese for low price and good quality as it serves as a major nutrition source in their meals. Processed cheese is mainly prepared by using various excipients like emulsifiers, citrates, vegetable oils, extra salt, food colorings, whey powder. Based on the concentrations of these excipients, the type and cost of processed cheese is decided which varies in both flavor and texture. Protein is the most expensive component in the processed cheese which affects the texture and firmness of the same. The content of protein plays an important role in processed cheese texture ^[1].

Processed cheese is generally prepared by blending naturally obtained cheese with various concentrations of emulsifying agents and then heating is done to blend the mixture with constant agitation under vacuum until a homogenous mass is obtained.

Cheese is prepared by different methods using diverse producers. Based on the type and amount of ingredients used and the protein content considered, the cost, taste and texture of processed cheese varies.

MATERIALS AND METHODS

This study was done to reduce the cost of the processed cheese with the same quality and organoleptic properties. Manufacturing of processed cheese includes protein as the main component ^[2]. The materials that are generally used for processing can be shown in **Table 1**.

Table 1. Ingredients that are generally used for the preparation of Processed cheese.

Sl.no	Ingredients	Quantity taken (Kg)
1	Milk protein	1
2	Native Starch	1
3	Processed Starch	1

This preparation contains about 8-10% of protein and it costs around 1.25USD.

Several trials have been done for production of processed cheese using native and modified starch with low protein content of 4-5%. The ingredients we have used for the production of cost effective processed cheese is shown in **Table 2**.

Table 2. Ingredients along with their quantities that were used for our work.

Sl.no	Ingredients	Quantity taken (%)
1	Skim Milk powder	10
2	Palm Oil	24
3	Native starch	10
Or-4	Modified Starch	2-2.5
5	Milk Protein Concentrate	0.3
6	Melting Salts	2.5
7	Mature Cheese Powder Cheddar	1
8	Sorbate	1000 ppm
9	Nisin	6 ppm
10	Cooking Salt	1

This process was carried out until the water content reaches 53%-50%, fat/dry matter-salt content-1.1%, protein-5%. In this process, the PH was maintained at 5.6.

Five trails were done by using varying concentrations of native and modified starch. Native starch was used at concentrations of 1%, 3%, 5%, 7% and 10% and protein content at 10%, 9%, 8%, 6%, 5% and 4% respectively. Similarly, different concentrations were used for the modified starch which was 0.5%, 1%, 1.5%, 2% and 2.5%; and also protein content 10%, 9%, 8%, 6%, 5% and 4%.

PROCESSING PROCEDURE

All the ingredients were blended into a homogeneous mix and were processed at 98 °C for 5 min using stephan cutter. During processing water was added in two stages. The motor speed was maintained at 1500 rpm. After completion of processing, the obtained slurry can be packed in various portions based on the shape. In this study, we placed in triangle portions.

After sometime the obtained processed cheese product samples were taken and tested for PH, dry matter, fat/dry matter-protein content, organoleptic properties (taste panel) specially the stickness to the foil and spreadability against the control ^[3].

RESULTS

The results reported that the native starch is better than modified starch because the texture was better and the cheese did not stick to the foil comparing to the modified starch, which made the texture like dough and stuck to the foil when the modified starch concentration exceeded by 2%. It was found that, when native starch up to 10%, protein content 4-5% and modified starch upto 2% were used, it showed results of processed cheese with good quality and as equivalent as the control one.

CONCLUSIONS

From the technological and economic points of view one could conclude that using 10% native starch or 2% modified starch could be used successfully in the manufacturing of processed cheese to reduce the protein content and cost respectively. The processed cheese prepared costs around 0.9 USD which was a reduced amount compared to the previous one.

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