



## Research Article

# Comparative study on the chemical composition and acceptability of a creamy dessert (pudding) prepared with coconut milk and dairy milk

Md Suzauddula<sup>1\*</sup>, Effat Ara Jahan<sup>2</sup>, Masum Billah<sup>3</sup> and Md Bellal Hossain<sup>4</sup>

<sup>1</sup>Research Associate, Department of Nutrition and Food Engineering, Daffodil International University, Bangladesh

<sup>2</sup>Senior Lecturer, Department of Nutrition and Food Engineering, Daffodil International University, Bangladesh

<sup>3</sup>Student, Department of Nutrition and Food Engineering, Daffodil International University, Bangladesh

<sup>4</sup>Professor, Department of Nutrition and Food Engineering, Daffodil International University, Bangladesh

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**\*Corresponding author:** Md Suzauddula, Research Associate, Department of Nutrition and Food Engineering, Daffodil International University, Bangladesh, E-mail: suzauddula34-506@diu.edu.bd

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## Abstract

Coconut milk is that the liquid obtained by manual or mechanical squeeze of grated coconut lying in moneyed white liquids. During this study, coconut milk and coconut milk pudding were pared, and it's microbiological, chemistry and sensory quality were studied. The dairy farm milk pudding was very little sweeter than coconut milk pudding. The dairy farm milk pudding was higher super molecule content than coconut milk pudding on the other hand coconut milk pudding found higher fat content than dairy farm milk pudding. The percentage of moisture, fat, minerals and total soluble solid were higher in CMP than DMP but percentage of protein CHO was showed opposite trends. No colony formation unit of yeast or bacteria was formed up to 14days but after 21 days only 02 cfu/g and 04 cfu/g of CMP and DMP accordingly. Sensory evaluation was conducted by 21 skill panelist on appearance, flavor, color and firmness. In quality parameter to take a look at it absolutely was shown that coconut milk pudding have high acceptable than dairy farm milk pudding but more research and development are required for commercialization.

## Introduction

The coconut tree (*Cocos nucifera*) is a member of the family Arecaceae (palm family) and the only species of the genus cocos. Coconut milk is the liquid that comes from the grated meat of a mature coconut. The opacity and rich taste of coconut milk are due to its high oil content, most of which is saturated fat. Coconut milk is a popular food ingredient used in Southeast Asia, South Asia, the Caribbean, and northern South America [1,2]. Coconut milk is the liquid obtained by manual or mechanical extraction of grated coconut meat. Coconut

milk is an important ingredient of many foods of Asian and Pacific regions including curry, deserts and sweets. In general, thermal treatment is given to food fluid to kill pathogenic micro-organisms and degrading enzyme in order to increase shelf life, product quality and product safety [3]. Heating process normally takes place in a system of indirect plate heat exchangers, which consists of preheating, heating, and cooling sections. After passing through heat treatment process, the coconut milk is filled in cans, boxes, soft plastic bags or processed powder forms. Pasteurization process has been found to be a short-term preservation process in which the



coconut milk is heated to pasteurization temperature of 72–75°C for 20 min [4]. Coconut milk is a complex biological fluid, typically composed of fat, protein, carbohydrates, and minerals as a milky white oil-in-water emulsion, a percentage of fat is adjusted depending upon local requirement in between 15–40% [5]. At high temperature (more than room temperature). Pudding is a type of food that can be either a dessert or a savory dish [6]. Pudding: Coconut milk pudding is a great choice for people allergic to or avoiding pudding made from cow’s milk or soy [7]. Coconut milk pudding is a type of food that can be either a dessert or a savory dish. The Study on chemical composition and sensory analysis of pudding prepared with coconut milk and cow’s milk. More specially the study have done quality parameters, the sensory parameters and identify microbiological load in coconut milk and dairy milk pudding.

### Materials & methods (coconut milk)

The study was conducted in the laboratories of the Department of Nutrition and Food Engineering, Daffodil International University, Dhaka. As raw material fresh coconuts were collected from local markets and used chemicals are given in table 1. For processing many tools and apparatus were being used knife, chopping board, bowl, and filter cloth, blender machine, measuring cylinder, beaker, conical flasks, burette, and pipette from University laboratory.

Table 1: Prepared recipe of coconut milk.

Ingredients	Function	Used (%)
Coconut extract	Raw Material	82.00%
Guar gum xanthan gum	stabilizer	00.02%
Polyoxyethylene (20) sorbitantristearate	emulsifiers	00.05
Potassium metabisulphite	bleaching agent	00.002%
Sodium benzoate	preservatives	00.01%
Citric acid	acidulant	00.10%
Tri-sodium citrate		00.03%
NaCl		00.05%
Water		17.56%

### Sample preparation

Collect coconut from market remove outer husk remove endocarp (hard bony shell), collect white coconut pulp (endosperm), cutting white coconut pulp, blending them by used blander machine, extract coconut milk by filtrate with a cloth [8]. As principle ingredient coconut milk (prepared by previous recipe at DIU lab) and dairy milk (from nearby dairy farm) and egg (from nearby shop) were managed (the amounts are in Table 2) (Figure 1).

### Chemical analysis

- Moisture, ash, protein, total soluble solids (TSS), Fat%, carbohydrate and pH of pudding samples were determined by following methods (Figure 2).
- Moisture content by digital moisture analyzing method at 105°C for 1 hours

Table 2: Prepared recipe for CMP and DMP.

Ingredients	Amount
<b>Coconut milk pudding</b>	
Coconut milk	300 ml
Egg	3 pcs
Sugar	1/3 cup
<b>Dairy milk pudding</b>	
Dairy milk	300 ml
Egg	3 pcs
Sugar	1/3 cup

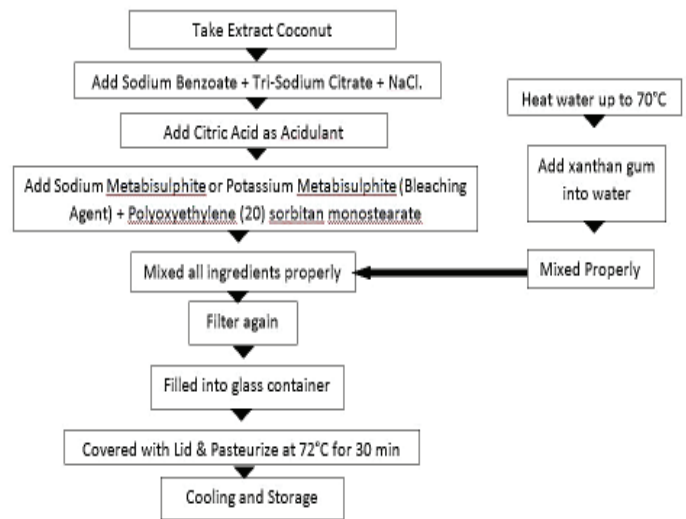


Figure 1: Flow chart of coconut milk extraction.

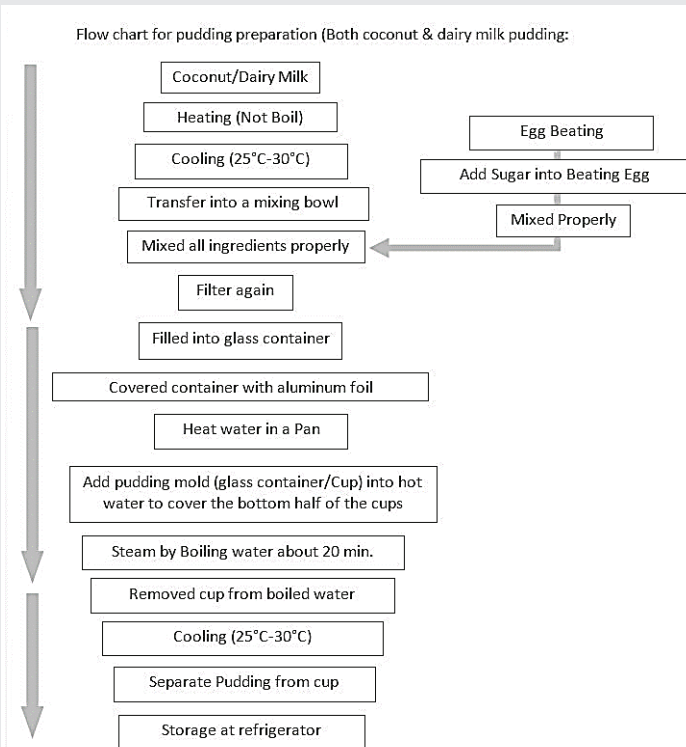


Figure 2: Flow chart of CMP and DMP.



- Ash content by muffle furnace ignition method at 550°C
- Protein content by protein analyzer
- TSS by Refracto-meter as degree brix (CB) and
- pH by pH meter
- Fat content was determined by garber method;
- Solid not fat and carbohydrate were determined by standard mathematical procedure.

### Microbiological analysis of pudding

Microbiological analysis (total viable count of probiotics): in order to claim a product to be probiotic the viability of probiotic bacteria is of primary importance [9]. The acidophilus product was evaluated at day-1 and day-6 of storage for its total viable number of lactobacillus acidophilus using MRSagar [10]. One ml of sample was taken and diluted with 9 ml of normal saline solution (v/v) and then serial dilutions were prepared using 1:9 dilution technique [11]. 1ml aliquot from different dilutions ( $10^{-3}$  and  $10^{-4}$ ) was used to check the total viable count per ml on MRS agar media.

For total yeast, mold count pour plate method (for pudding) used to determine the number of microbes/ml or microbes/gram in a specimen. Media was prepared and sterilized by autoclave at 121°C for 15 minutes, 14.5 psi. By taking specific amount of sample in Petridis cold media in 40°C about 15-20ml of media is pour in Petridis and properly homogenized by clockwise & anticlockwise and allow to solidify. After solidification incubate the plate at 37°C in inverted position for 24-48 hours. After incubation the colony were count by colony counter.

Total Coliform count of Pudding was identified through membrane Filtration method [12]. Membrane was sterilized through 70% alcohol into laminar flow. Then the membrane filter paper placed in holder & fixed with funnel. The sample was poured into funnel & switch vacuum pump on.

Sample passed through membrane due to negative pressure of vacuum pump & samples are collected in another vessel. Carefully the filter was removed from the filter holder using sterile forceps. Carefully placed the filter on the Endo agar. Inverted the plate and incubated it for 24 hours at 35-37°C. The filter membrane was examined for presence of colored (red colonies) colonies.

### Sensory analysis of pudding

Sensory Evaluation Sensory evaluation of pudding were carried out by 20 panelists on a nine-point hedonic scale [13] for different sensory parameters such as color, flavor, taste, consistency and overall acceptability. Prepared coconut milk pudding and dairy milk pudding were subjected to sensory evaluation by a trained panel of 20 judges. The panelists had previous experience in dairy products evaluation. The panel comprised of post graduate students who are employee at food and Beverage production organization. And they involved

sensory panel board for sensory evaluation of the organization. The evaluation of the product was carried out on appearance, taste, color, flavor and overall acceptability on a 9point hedonic scale (9 = like very much; 1 = dislike very much) [14]. Sensory evaluation performed along with the consent form to participate in sensory evaluation was prepared and distributed to the panelists.

### Statistical analysis

All the data obtained from three replications were analyzed as a completely randomized design procedure using the general linear model procedure of the SPSS statistical package program (SPSS, Inc., Chicago, IL). Duncan's multiple range test was used to measure the significant difference between means ( $P < 0.05$ ). Sensory evaluation was carried on hedonic scale [15]. The data collected on pH, acidity and sensory evaluation for different treatment groups of coconut and dairy milk pudding was subjected to analysis of variance (ANOVA) and comparison was made for difference of acidity among various treatments with respect to storage through Duncan's Multiple Range (DMR) test with a probability  $P < 0.05$  [16].

## Result & discussion

### Chemical composition of coconut

Table 3 and Figure 3 shows the different nutrition value of CMP and DMP. Dairy Milk pudding was little sweeter than Coconut Milk Pudding. Dairy Milk pudding was higher protein content (4.98%) than Coconut Milk Pudding (3.62%) but Coconut Milk Pudding was higher fat content (8.9%) than Dairy Milk Pudding (7.2%).

**Table 3:** Chemical Composition of Coconut Milk & Dairy Milk Pudding.

Sample Name	Moisture (%)	Protein (%)	Fat (%)	CHO (%)	Ash (%)	pH	Brix <sup>o</sup>
Coconut Milk Pudding	76.25	3.62	8.9	85.70	1.78	4.26	31.47
Dairy Milk Pudding	74.98	4.98	7.2	86.53	1.29	4.39	24.52

### Microbiological analysis of pudding

Table 4 shown that there not any microbial change both coconut milk pudding and dairy milk pudding after 7 days and after 14 days. But after 21 days total yeast & mold count of coconut milk found 2cfu/g and total yeast & mold count of dairy milk found 4cfu/g. Both coconut milk and dairy milk pudding not found any total coliform count after 21 days [17].

### Sensory analysis

Compare figure among coconut milk pudding and dairy milk pudding with Overall acceptance Figure 4 shown that only 1 panelist score (5) neither like or dislike about coconut milk where 3 panelist score (5) neither like or dislike about dairy milk. Number of 5 panelist score (7) like moderately about coconut milk where 4 panelist score (7) like moderately about dairy milk. Number of 8 panelist score (8) like very much about coconut milk where 6 panelist score (8) like very much



about dairy milk and 4 panelist score (9) like extremely about coconut milk where only 2 panelist score (9) like extremely about dairy milk. For that chart we found that coconut milk is more acceptable than dairy milk according to panelist feedback.

Table 5: Shows the summary of sensory scores (mean standard deviation) of coconut milk pudding and dairy milk pudding. It was revealed that mean score of coconut milk pudding is greater than dairy milk pudding in every attributes of sensory analysis.

### Conclusions

In this study, Coconut Milk and Coconut Milk Pudding was primed and its microbiological physicochemical and sensory excellence were studied and we found that coconut milk

content highly fat (8.9%) than dairy milk fat (7.2%) content. Dairy Milk pudding was higher protein (4.98%) content where Coconut Milk Pudding protein (3.62%) content. Dairy Milk pudding was tiny sweeter than Coconut Milk Pudding. There not any microbial change both coconut milk pudding and dairy milk pudding after 7 days and after 14 days. But after 21 days total yeast & mold count of coconut milk found 2cfu/g and total yeast & mold count of dairy milk found 4cfu/g. Both coconut milk and dairy milk pudding not found any total coliform count after 21 days. The study sensory results within 20 panelist indicate that for appearance, color, flavor and firmness we found that coconut milk score higher than dairy milk pudding. For that results we found that coconut milk is more acceptable than dairy milk according to panelist feedback.

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Table 4: Microbial observation of sample.

Test	Result					
	After 7 days		After 14 days		After 21 days	
	CMP	DMP	CMP	DMP	CMP	DMP
Total yeast & mold Count	Absent	Absent	Absent	Absent	2 CFU/g	4 CFU/g

Table 5: Sensory attribute scores of coconut and dairy milk pudding.

Sample	Appearance	Flavor	Color	Firmness
Coconut Milk Pudding	7.75 ±1.918	6.60 ±1.60	6.88 ±1.542	6.73 ±1.467
Dairy Milk Pudding	5.98 ±0.996	6.21 ±1.216	5.96 ±1.115	6.43 ±1.319

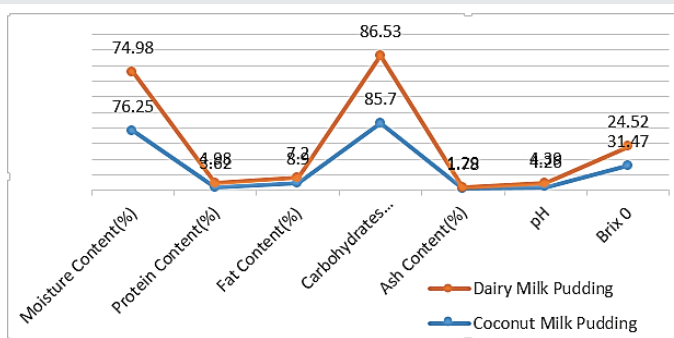


Figure 3: Chemical Composition of Coconut Milk & Dairy Milk Pudding.

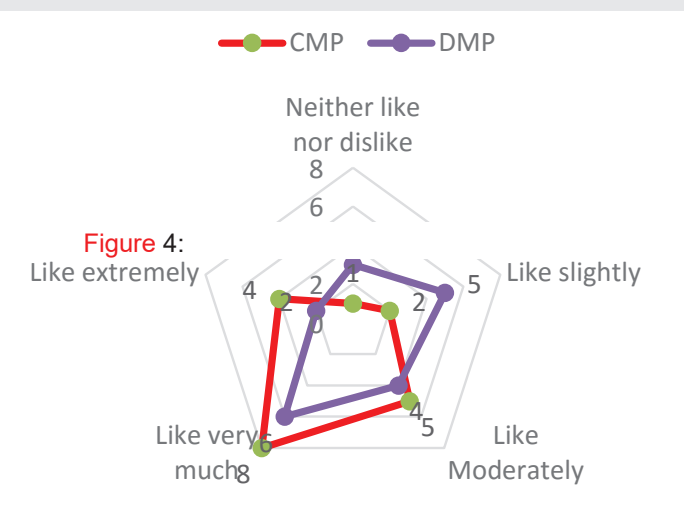


Figure 3: Chemical Composition of Coconut Milk & Dairy Milk Pudding.



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