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Physicochemical Characteristics of Cottage Cheese from Coconut Products and Carabao's Milk

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Abstract

Objective: To formulate a cottage cheese from coconut products and carabao's milk. **Methods/Statistical Analysis:** The study was carried out with different blends of coconut milk and carabao's milk. The product was evaluated for its sensory characteristics (taste, aroma, texture and general acceptability) by 60 raters group into four using a 9 point Hedonic Scale. Proximate analysis (moisture content, crude protein content, fiber content, and ash content) and microbial analysis (total coliform count, aerobic plate count and yeast, and molds) of the product with highest general acceptability was also analyzed. Cost of production was computed and shelf life was directly observed. **Findings:** Significant difference was observed on the taste, texture and general acceptability due to the added coconut milk. No variation was found on the aroma and the preference of the raters across groups. The blend with 1 part coconut milk gained the highest general acceptability. Laboratory analysis revealed that the product is packed with nutrients. Cost analysis showed a much cheaper cottage cheese can be produced as compared to the commercialized one with a shelf life that extends from two days at room temperature to four days when refrigerated. **Application:** The finding of this study trim down the dependence of sole use of carabao's milk in cottage cheese production.

Keywords: Cottage Cheese, Coconut Products, Carabao's Milk, Natural, Processing

1. Introduction

Spreadable cheese, sliced cheese, string cheese, individually wrapped cheese, and spray cheese - these are just some of the weird and wonderful modern prepared cheese foods people have access to these days. These are real cheese that has emulsifiers to keep water and oil stick together to exhibit more consistency. Salt, food coloring and whey are also introduced in the product[1].

Many manufacturers claim that their product is made from or with real cheese, but the cheese base is considerably transformed by the time the processed product is complete. Processed cheese is essentially engineered and mass produced that is designed to taste good and perform well in the mass food market at a very low cost. However, this food contains dairy by-products, emulsifiers, saturated vegetable oils, excess sodium, food coloring agents, preservatives and sugar.

All types of processed cheese have the advantages of longer shelf life and product uniformity. These features make such products convenient for the consumer but the presence of artificial ingredients introduces certain health risks[2]. Sodium phosphate is a common ingredient in processed cheese but doctors warn that it can damage the kidneys. This is usually determined from careful study[3]. Yellow 6 and Yellow Tartrazine is a food coloring applied to cheese but is banned in certain European countries due to its threat to tumor growth in the adrenal glands and kidneys[4].

The argument of some consumers that processed food is made to be cheaper can be consumed easily, and with acceptable taste, is definitely true. With low nutritional value, processed foods are being sold at low prices, which are making these foods affordable for the people. These foods were made with preservatives making it last longer also; make it convenient to people when it comes to

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cooking. The existing problem is the result of companies' heavy reliance on additives, synthetic nutrients, and other unhealthy ingredients to sustain and sell their products[5].

Too much intake of this processed food contributes to the declining ability of the body to absorb potential antioxidants, which the body needs in order to self – heal sufficiently[6]. Antioxidants play a vital role in the maintenance of the different body systems to run smoothly. The natural defense mechanism would abruptly go down with higher risks of accelerated aging in a short amount of time. The entire waterfall effect among hormones, inflammatory chemicals, and free radicals sets the stage for accelerated aging. It also spells a recipe for energy disaster.

Cottage cheese from the blend of coconut milk and carabao milk is made from natural sources not to forget that most of its ingredients come from coconut products. Thus, it is safer to say that the product is much safer and it can provide nutrients and vitamins beneficial to the body.

Generally, the study formulated a cottage cheese from coconut products and carabao's milk. Specifically, the study aimed to determine the physical characteristics of the cottage cheese, conduct proximate Analysis of the product, conduct Microbial Analysis of the product, conduct preliminary product costing, and establish the shelf life of the product

2. Materials and Methods

2.1 Research Design

This study employed the Randomized Complete Block Design with a control treatment and three other treatments. This design was suited for the study since the treatments and the groups of raters were the only considered factors that may cause variability.

2.2 Materials of the Study

The materials and tools that were used in the study are grater, blender, clean pot, small basin, colander, molder, plastic wrap, and electric stove, cheesecloth, measuring cups, graduated cylinder and thermometer.

2.3 Treatments of the Study

The treatments of the study are as follows: treatment 1 is a Commercialized cottage cheese, treatment 2 contains 1 ½ part coconut milk, and treatment 3 contains 1 part coconut milk, treatment 4 contains ½ part coconut milk.

2.4 Ingredients

The ingredients used in the study include coconut milk,coconut vinegar, coconut sugar,carabao milk, salt

2.5 Securing of Commercialized Cottage Cheese

The commercialized cottage cheese which served as the control of the study was bought at the supermarket in SM North Edsa.

2.6 Collection of Coconut Fruit

Brown coconuts (12-14 months old) were collected in Callungan, Sanchez Mira, and Cagayan.

2.7 Securing of Carabao's Milk

Fresh carabao's milk was bought in Alcala, Cagayan.

2.8 Securing of Coconut Vinegar

The coconut vinegar that triggered coagulation in the study was bought from the Business Office of Cagayan State University-Sanchez Mira.

2.9 Extraction of Coconut Milk

The extracted coconut milk from five-kilogram grated coconut meat was transferred to a blender, thus, increasing the yield of pure coconut milk. Cheesecloth was used to squeeze out coconut milk. The extract was placed in a clean basin.

2.10 Preparation of Coconut Sugar

The study adopted a defined method of acquiring coconut sugar[7].

Step 1: Selection of tree and collection of coconut sap

Healthy bearing trees with unopened inflorescence were selected for tapping. The mature unopened inflorescence was bent down to allow the flow of the sap after tapping. A plastic twine was tied to the inflorescence until it was pulled downward. A slice was made to tap the inflorescence at 6 mm using a sharp knife. The sap that oozes out was collected with the use of a plastic vessel. The coconut sap should be cooked before 5 hours after it was gathered to prevent it from turning into a tuba.

Step 2: Heat evaporation

The collected sap was boiled up to 115 degrees Celcius on a pot. When the liquid was already boiling, the scum

was removed to avoid the formation of dark residues. The boiling of the sap took about 3 – 4 hours to remove the water content, leaving the sugar content of the coconut sap.

Step 3: Conversion of Sap Syrup to Coconut Sugar

The syrup was heated and was stirred continuously to avoid burning and to ensure granulation. The pot was removed in the fire and a follow up stir continued until sugar granules were formed.

Step 4: Sieving and Drying the Coconut Sap Sugar

The sugar was cooled out and it was pressed to break the lump. The sugar was sieved to obtain uniform particle size.

2.11 Milk Formulation

There were three setups in the study. The portion of the fresh coconut milk and carabao's milk was measured according to the needed ratio, T2 (1 ½ parts coconut milk: 3 parts carabao's milk), T3 (1 part coconut milk: 3 parts carabao's milk), T4 (½ part coconut milk : 3 parts carabao's milk).

2.12 Standardization of Cheese Formulation

Pretrial experiments were conducted to establish the cheese formulation used in the study. First, when one part carabao's milk was added, a cottage cheese with sauce like appearance was produced. Second, adding two parts carabao's milk to form the blends yielded a better appearance and consistency but the characteristic cannot still suffice the needed outcome. Lastly, adding three parts carabao's milk resulted in the desired effect. No further increase in the proportion of carabaos was made to cut down the expenses to be incurred.

The inclusion of vinegar was noted at one tablespoon per preparation. When the solution was mixed with less vinegar a poor coagulation was observed. On the other hand, a greater amount of vinegar makes the product very acidic, thus making the taste unacceptable.

The proportion for coconut sugar and salt was set at one tablespoon per preparation. Lesser, as well as a greater proportion in relation to the established standard, created a deviation from the natural taste of the cheese.

2.13 Cheese Making

The milk blend was heated to a clean pot at 85 degrees Celcius using a digital thermometer. The mixture was constantly stirred to avoid burning. When the mixture started to boil, the fire was turned off and 10 mL of coconut vinegar was added to hasten coagulation. The mixture was stirred for three minutes to evenly distribute the vinegar. A follow-up stir was done on the milk blend to enable coagulation into white curds and whey.

To separate the curd from the whey, the mixture was poured into a colander with a fine cheesecloth placed in it. After which, the cheesecloth was squeezed and hung for an hour to allow the excess whey to drain by gravity. Solid curds were left from the cheesecloth.

To add flavor to the collected curd, one tablespoon of salt and one tablespoon of coconut sugar were mixed with while stirring the solution.

The cheese curd was collected in the cloth and it was immediately placed in a molder that was covered with a clear plastic. It was stored in the refrigerator right away.

The same steps were undertaken to the remaining treatments.

2.14 Evaluators of the Study

Four groups of raters with 15 raters in each group evaluated the finished product. They were grouped as CHIM and Chemistry teachers, T.L.E. teachers, cooks and bakers, and students. The raters do not have an issue involving the product.

2.15 Selection of Raters

Purposive Sampling Technique was used in selecting the raters. They were purposely selected in accordance with the nature and objectives of the study.

2.16 Data Gathering Procedure

The raters evaluated the product in terms of the quality (taste, aroma, texture, general acceptability) using a 9-point Hedonic Scale[8].

2.17 Statistical Analysis of the Data

The data gathered were analyzed and interpreted using Analysis of Variance. Least Significant Difference (LSD) was used to determine which treatments mean differ at 0.05 and 0.01 level of significance.

2.18 Proximate Analysis

The treatment with the best formulation based on the result of LSD was subjected for analysis. The sample was analyzed at the Department of Agriculture Regional Field Office at Carig, Tuguegarao City. Moisture content was analyzed by Moisture Analyzer, ash content by

Gravimetric, crude protein by Foss Tecator, crude fiber by Filter Bag Technique (ANKOM)), and crude fat by Filter Bag Technique (ANKOM)).

2.19 Microbial Analysis

The treatment which obtained the highest mean in the general acceptability was analyzed at the Department of Science and Technology Region 02. Food and Drug Administration (FDA) Bacteriological Analytical Manual (BAM) test parameter was used to investigate the total coliform count, aerobic plate count and yeast and mold count of the sample.

2.20 Cost Analysis

The cost of the finished product was based on the expenses incurred by the researcher in preparing the homemade cottage cheese.

2.21 Shelf Life

The shelf life of the product was determined by the researcher by means of direct method (real-time observation) taking into consideration the changes in taste, aroma, and the presence of spots in the cheese. The sample was observed both at room temperature and when placed inside the refrigerator at 8 degrees Celcius on a day to day basis.

3. Results and Discussions

3.1 Physical Characteristics of the Cottage Cheese

3.1.1 Taste of the Cottage Cheese

As gleaned in Table 1, the treatment with 1 part coconut milk obtained the highest mean of 7.45 or "very palatable". The other three treatments had means ranging from 6.2 to 7.08, all of which were rated as "moderately palatable". Moreover, multiple comparisons between treatmentsmean disclose that there is a significant difference in the taste of the different treatments as assessed by the raters. This is proven by the F – computed value of 6.93 which is higher than the F- critical value of 3.86 at 0.05 level of significance.

When the control, the commercialized cottage cheese, and the cheese with 1½ part coconut milk were matched up, they were statistically comparable. When, however, the three treatments were compared to the cheese with 1½ part coconut milk, a significant difference exists. The higher mean obtained by the three treatments means that they taste better than the cheese with 1 and ½ parts coconut milk. This implies that the amount of coconut milk in the treatments affects the taste of the cottage cheese produced. The higher the amount of coconut milk, the blander it becomes.

A significant difference in the taste was observed from the samples as influenced by varying proportions of added coconut milk.

Analysis of variance further shows that there is no significant variability on the acceptability of the four groups of raters. Regardless of the status of the raters, they have the same preference as regards the taste of the cottage cheese.

3.1.2 Aroma of the Cottage Cheese

In relation to the data presented in Table 2, the aroma of the cheese with 1 part coconut milk was "very pleasant" with a mean of 7.23. The other treatments (control, 1½ part coconut milk, and ½ part coconut milk) were all rated "moderately pleasant" with the corresponding means of 7.07, 6.50 and 7.12. This means that the aroma of the products developed is equally alike. This can be

Table 1. Taste of cottage cheese from coconut products and carabao's milk as perceived by the raters

Treatments / Groups	G1	G2	G3	G4	Total	Mean	DV
T1 (control, commercialized cottage cheese)	7.2	6.7	7.7	6.3	27.9	6.98[a]	MP
T2 (1 1/2 parts coconut milk)	6.4	6.2	6.3	5.9	24.8	6.2[b]	MP
T3 (1 part coconut milk)	7.6	7.5	7	7.7	29.8	7.45[a]	VP
T4 (1/2 part coconut milk)	7.4	6.9	6.8	7.2	28.3	7.08[a]	MP
Total	28.6	27.3	27.8	27.1	110.8	27.7	
Mean	7.15	6.83	6.95	6.78	27.7	6.93	MP
DV	MP	MP	MP	MP			

$LSD_{.05}$ = **0.6376**

Table 2. Aroma of the cottage cheese from coconut products and carabao's milk as perceived by the raters

Treatments / Groups	G1	G2	G3	G4	Total	Mean	DV
T1 (control, commercialized cottage cheese)	7.20	7.00	7.53	6.53	28.26	7.07	MP
T2 (1 1/2 part coconut milk)	6.67	6.53	6.67	6.13	26	6.50	MP
T3 (1 part coconut milk)	7.40	7.13	6.87	7.53	28.93	7.23	VP
T4 (1/2 part coconut milk)	7.67	7.00	6.40	7.40	28.47	7.12	MP
Total	28.94	27.66	27.47	27.59	111.66	27.92	
Mean	7.24	6.92	6.87	6.90	27.915	6.98	MP
DV	VP	MP	MP	MP			

verified by the observed F – computed value of which is lesser than the F- critical value.

With reference to the groupings made, no significant variability can be perceived, since the F- computed value falls in the rejection region at 0 .05 and 0.01 level of significance. Their groupings do not influence their decision to rate the aroma of the cheese.

3.1.3 Texture of the Cottage Cheese

It is evident in Table 3 that the control, the cheese with 1and ½ parts coconut milk and the cheese with ½ part coconut milk were rated "moderately smooth" as revealed in their respective means of 7.1, 6.62 and 7.13. The texture of the cheese with 1 part coconut milk was "very smooth" with a mean of 7.32.

A disparity in texture can be observed among the treatments as assessed by the raters. This is proven by the F- computed value of 4.667 that is relatively higher than the F- a critical value of 3.86 which makes the claim justifiable at 0.05 level of significance. High-fat content and liquid content of coconut milk can be inferred as the cause of variation. Since oil is immiscible to water there will be a tendency that water will be removed easier from the finished product.

Certain associations were made in relation to treatment means. The control and the cheese with ½ part coconut milk, when compared with each other, do not vary. In short, a similar texture can be sensed for the three treatments. On the contrary, a variation can be identified when the control, the cheese with 1 part coconut milk and the cheese with ½ part coconut milk are matched up to the cheese with 1½ part coconut milk. This observation explains that the cheese with 1/2 part coconut milk possesses a different texture as compared with the other cheeses.

Further, Analysis of Variance proved that there is no significant difference in the preferences of the groups of raters as regards texture of the cheese. The F- computed value which is lesser than the F- critical value at 0.05 and 0.01 level of significance proves this claim.

3.1.4 General Acceptability of Cottage Cheese

With reference to Table 4, the cheese with one part coconut milk obtained a higher mean of 7.49 as compared from the mean of 7.34 acquired by the cheese with ½ part

Table 3. The texture of the cottage cheese from coconut products and carabao's milk as perceived by the raters

Treatments / Groups	G1	G2	G3	G4	Total	Mean	DV
T1 (control, commercialized cottage cheese)	7.13	7.00	7.27	7.00	28.4	7.10^{a}	MS
T2 (1 1/2 part coconut milk)	6.93	6.40	6.20	6.93	26.46	6.62^{b}	MS
T3 (1 part coconut milk)	7.33	7.53	6.93	7.47	29.26	7.32^{a}	VS
T4 (1/2 part coconut milk)	7.53	6.80	6.67	7.53	28.53	7.13^{a}	MS
Total	28.92	27.73	27.07	28.93	112.65	28.16	
Mean	7.23	6.93	6.77	7.23	28.1625	7.04	MS
DV	MS	MS	MS	MS			

$LSD_{.05}$ = 0.4429

Table 4. General acceptability of the cottage cheese from coconut products and carabao's milk as perceived by the raters

Treatments / Groups	G1	G2	G3	G4	Total	Mean	DV
T1 (control, commercialized cottage cheese)	7.40	7.07	7.40	6.87	28.74	7.19[ab]	LM
T2 (1 1/2 part coconut milk)	6.47	6.73	6.13	6.20	25.53	6.38[b]	LM
T3 (1 part coconut milk)	7.47	7.60	7.07	7.80	29.94	7.49[a]	LVM
T4 (1/2 part coconut milk)	7.47	7.27	6.60	8.00	29.34	7.34[a]	LVM
Total	28.81	28.67	27.2	28.87	113.55	28.39	
Mean	7.20	7.17	6.80	7.22	28.3875	7.10	LM
DV	LM	LM	LM	LM			

$LSD_{.01}$ = 0.8547

coconut milk. However, both were rated "like very much". The two other treatments (control and 1 ½ part coconut milk) were "like moderately" with a mean of 7.19 and 6.38, respectively.

Analysis of variance proved that there is a significant difference between the four treatments as to general acceptability based on the evaluation made by the raters. This is proven by the F- computed value of 6.99 which is higher than the F- a critical value of 3.86 at 0.01 level of significance. This can be associated with the latter findings on the taste and texture of the product that affects its general acceptability.

Comparison among treatment means shows that T1 (control) and T2 (1 1/2 part coconut milk) are the same as to general acceptability among the raters. In like manner, T1 (control), T3 (1 part coconut milk) and T4 (1/2 part coconut milk) demonstrate the same trend. This can be linked to the treatment means that are relatively close. However, T1 (control), T3 (1 part coconut milk) and T4 (1/2 part coconut milk) (control) having been compared to T2 (1 and 1/2 part coconut milk) yield a significant variation.

There is no significant difference in the way the group of raters views the overall acceptability of the cottage cheese. This is proven by the F- computed value which is lesser than the F- critical value at 0.05 and 0.01 level of significance. This means that a similar evaluation can be achieved from the different groups regardless of achieved status.

3.2 Proximate Analysis of the Cottage Cheese

The results of the proximate analysis of the cottage cheese with 30 percent of coconut milk are shown in Table 5.

Approximately 22.1 percent moisture content was examined from the cheese sample. Therefore, elevated water content is present in the product. This can be explained by the fact that coconut milk and carabao's milk hold a substantial quantity of water. Based on the 80 percent moisture content of commercial cottage cheese[9], a gross difference of 57.9 percent was computed which connotes a lower percentage on the part of the cottage cheese produced.

Ash content occupies a fraction equal to 1.32 percent of the sample. It denotes the presence of inorganic components such as calcium, sodium, and potassium. These percentage compositions were influenced by the mineral content of coconut vinegar (0.45 percent), coconut sugar (2.1 g/100 g sample), salt, coconut milk (0.9 percent) and carabao's milk. (0.4 percent)[2,10-12]. In comparison to the ash composition of cottage cheese[9], the ash content of the cottage cheese produced is 0.82 percent higher. It is then safe to say that the cottage cheese produced is rich in minerals.

As regards protein content, the cheese sample consists of 10.85 percent. This result can be linked to the presence of protein in the ingredients used. A 0.16 percent protein in coconut vinegar[10], 3.5 percent protein in coconut milk[11]

Table 5. Proximate analysis of cottage cheese with 30 percent coconut milk

Sample Description	Moisture, %	Ash, %	Crude Protein, %	Crude Fat, %	Crude Fiber, %
Cottage Cheese with 30 parts coconut milk	22.1	1.32	10.85	31.1	1.63

and 3.87 percent protein in carabao's milk[12]. A practical implication of the finding suggests that the finished product is a potential source of protein. The documented 17 percent protein in a typical cottage cheese[9]. This signifies a seven percent difference in favor of the commercialized cottage cheese.

Analysis revealed that fat covers the highest proportion (31.1 percent) in the sample. It has been noted in the literature review that fat exists in coconut vinegar, coconut sugar, coconut milk and carabao's milk with 0.14 percent, 0.1 g/ 100 g sample, 38 percent, and 5.25 percent[2,10-12]. This coincides with the fact that coconut meat contains considerable amount of fats[13].

The outcome of the study is extremely high in comparison with the 0.5 percent fat in the cottage cheese[9]. A difference of 30.6 percent was calculated.

Fiber which is not present in cottage cheese was detected in the product. The 1.63 percent fiber recorded came from the coconut vinegar (0.035 percent)[10].

3.3 Microbial Analysis of Cottage Cheese

Laboratory test results are shown in Table 6 signify a considerable amount of microorganisms present in the cheese sample.

Aerobic plate count accounts to 9.0 x 10^4 CFU/g. This viable number can be linked to microorganisms that were included during and after the production process[8].

A total coliform count is greater than 1100 MPN/g. This result in relation to the prescribed maximum number equal to100 MPN/g higher[3]. This means that large a number of bacterial populationsare present in the cheese sample.

An estimated 1500 CFU/g was analyzed from the cheese sample. The presence of this number can be associated with the moisture content of the cheese sample since molds grow in a damp environment as mentioned by the U.S. Environmental Protection Agency.

There were no defined limits for aerobic plate count and yeast and mold count in order to make comparison[1].

Table 6. Microbial analysis of the cottage cheese with 1 part coconut milk

Test Method	Result
Aerobic Plate Count	9.0 x 10^4 CFU/g
Total Coliform Count	> 1100 MPN/g
Yeast and Mold Count	1500* CFU/g

*estimated

3.4 Cost Analysis

On the basis of the expenses incurred in the production of cottage cheese, this cost analysis was made.

Table 7 shows the cost of production of cottage cheese that yields 200 grams. The cost difference between Treatment 2 and treatment 3 is Php 7.50 which is 4.24 percent lower than the price of the Treatment 2 at Php 176.87.00. In contrast, a 15 peso cost difference was calculated between Treatment 2 and Treatment 4 which is 9.27 percent lower than the price of the Treatment 2.

The comparison shows that Treatment 3 is Php 120.63 or 41.60 percent cheaper than the commercialized cottage cheese valued at Php 290.00. This implies that a much cheaper cottage cheese can be produced with comparable sensory characteristics with that of the commercialized one.

3.5 Shelf Life

As reflected in Table 8 treatment's taste and aroma are still acceptable for two days at room temperature. There are no spots detected that may signal the formation of molds. On the third day, the taste of the sample was no longer acceptable in like manner with the aroma which was rancid. Spot formation started on the fourth day which became evident until the seventh day. This result is lower compared to the shelf life of which is three to five days[9].

On the contrary, when the treatment was placed inside the refrigerator, it is still consumable after four days. This means that the taste is acceptable, the aroma is pleasant and no spot formation was observed. On the fifth day, changes were recorded in terms of taste and aroma. It became spoiled and rancid correspondingly but with no spot formation of molds. The product is no longer safe to consume, moreover spot formations were noted on the seventh day as a result of multiplying microorganisms.

Table 7. Cost of cottage cheese at 200 grams

Materials	Treatment 2	Treatment 3	Treatment 4
Coconut milk	Php 22.5	Php 15.00	Php 7.50
Coconut sugar	Php 2.00	Php 2.00	Php 2.00
Coconut vinegar	Php 3.00	Php 3.00	Php 3.00
Carabao's milk	Php 108.00	Php 108.00	Php 108.00
Salt	Php 1.00	Php 1.00	Php 1.00
Electricity	Php 2.87	Php 2.87	Php 2.87
Labor	Php 37.5	Php 37.5	Php 37.5
Total	Php 176.87	Php 169.37	Php 161.87

Table 8. The shelf life of the cottage cheese with 1 part coconut milk at room temperature

Treatment	1st Day	2nd Day	3rd Day	4th Day	5th Day	6th Day	7th Day
Kept at room temperature	a.1, b.1, c.1	a.1, b.1, c.1	a.2, b.2, c.1	a.2, b.2, c.2	a.2, b.2, c.2	a.2, b.2, c.2	a.2, b.2, c.2
Kept inside the refrigerator	a.1, b.1, c.1	a.1, b.1, c.1	a.1, b.1, c.1	a.1, b.1, c.1	a.2, b.2, c.1	a.2, b.2, c.1	a.2, b.2, c.2

4. Conclusion

The advent of chemicals in processed foods posts a potential threat to its consumer. An organic cottage cheese is made from natural sources since most of its ingredients are made from coconut products and carabao's milk. An experimental study was conducted to test the feasibility of producing cottage cheese from blends of coconut products and carabao's milk.

The formulated cottage cheese was found to contain protein, minerals, and fats. Moreover, an assured percentage of fiber which is not usually present in the commercialized cottage was detected. Aerobic plate count for microorganisms from the cottage cheese sample was 9.0 x 104 CFU/g with a total coliform count greater than 1100 CFU/g and an estimated yeast and mold count equal to 1500 CFU/g. A cheaper cottage cheese was produced with a shelf life of two days at room temperature and four days when refrigerated.

The results of the study lead to the conclusion that the cheese samples produced vary in term of taste, texture and general acceptability but the aroma is equal from each other as evaluated by the raters. The preference of the raters in groups is the same with reference to the physical characteristics of the cheese samples. Thus, a blend of coconut products and carabao's milk yields a product with good sensory properties. It can be said that the cottage cheese with one part coconut milk (acquired the highest mean on general acceptability) exhibits the low amount of moisture, is packed with essential minerals, protein, saturated fat and fiber which helps the body compensate required nutrients. A considerable amount of microorganisms were present in the cheese (one part coconut milk) which affects the quality of the product. The cottage cheese (one part coconut milk) produced cost-effectively. A shelf life of the cottage cheese (one part coconut milk) last longer when placed in a refrigerator.

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