

Preparation and Effectiveness of Toddy Palm Paste in Food

Khin Si Win¹

Abstract

In this research, toddy palm paste was prepared from mature and ripe toddy palm fruit. High quality processed toddy palm chiffon cake was prepared with processed toddy palm paste. The most favourable baking temperature, 180 °C and baking time, 25 min was employed to obtain the processed toddy palm chiffon cake. Furthermore, high quality raw materials such as cake flour, butter, baking powder, sugar, salt, egg, vegetable oil, water, vanilla extract, cream of tartar, and toddy palm paste were employed to produce the most attractive processed toddy palm chiffon cake. By the addition of toddy palm paste in baking the cake, the quality of processed toddy palm chiffon cake have a brighter colour, emollient texture and pleasant flavour than that of processed chiffon cake without toddy paste. The nutritional values of the processed toddy palm chiffon cake were analyzed and compared with that of the commercial chiffon cake (Brand name - Season) from local market.

Keywords: toddy palm paste; toddy palm fruit; chiffon cake

Introduction

Cake is a food of sweet dessert that is typically baked. Cakes were modifications of breads, but cakes now cover a wide range of formulations that can be simple or complex. Main ingredients for the preparation of cakes are flour, eggs, sugar, butter or oil or margarine and leavening agents, such as baking soda or baking powder. Common additional ingredients and flavourings, include dried or candied fruit, nuts, cocoa, and extracts such as vanilla, with numerous substitutions for the primary ingredients. Cakes can also be modified with fruit preserves, nuts or dessert sauces, iced with butter cream or other icings and decorated with marzipan or fresh fruits.

Many different types of cake recipes and numerous ways of classification are found. The general classification used is whether or not they contain fat such as shortening. Therefore, they are called shortened cakes or unshortened cakes. Chiffon cakes are indicated in the third category, but they are often included with unshortened cakes (<http://www.craftybaking.com/learn/cakes> Introduction).

A chiffon cake is a type of very light cake made with vegetable oil, eggs, sugar, flour, baking powder, and flavouring. Instead of butter or shortening, vegetable oil is also used; but this is a difficult to beat enough air into the batter. Therefore, chiffon cakes give a fluffy texture by having egg whites beaten until stiff and folded into the cake batter before baking. The batter, based with the oil, is initially kneaded before folding into the meringue.

The aim of this research is to study the effectiveness of toddy palm paste in the processing of chiffon cake.

The objectives are

- to search the most favourable amount of raw materials for baking of the processed toddy palm chiffon cake
- to understand the processing methods and the processing conditions of toddy palm chiffon cake

¹ Professor, Dr, Department of Industrial Chemistry, University of Mandalay

Materials and Methods

Raw Materials for Cake

Chemical raw materials for the processing of cake were purchased from 555 Store at No. 134, 27th St., Pabedan Township, Yangon Region. Other raw materials were purchased from the Market Place by City Mart at Junction City, Pabedan Township, Yangon Region. The Toddy palm fruits were collected from Ngarr Gyi Win Village, Thanatpin Township, Bago Region.

Preparation of Toddy Palm Paste

Mature, sound and ripen toddy palm fruit was washed and removed the peel of the fruit. Then, the fiber of the toddy palm fruit was rinsed with cold water to extract toddy palm paste. The slurry of toddy palm paste was filtered with the filter cloth, shown in Figure (1), to remove the filtrate toddy juice. After filtering, the toddy palm paste was collected from the filter cloth. Then the paste was stored in a refrigerator and ready to use in baking.



Figure (1) Filtration of Toddy Palm Paste

Preparation of Processed Toddy Palm Chiffon Cake

Processed toddy palm chiffon cake was prepared by three portions – portion A, B and C. In portion A, 100 g of cake flour, 60 g of superfine/icing sugar, 6 g of baking powder, 15 g of toddy palm paste and 2 g of salt were thoroughly mixed by hand mixer. In portion B, 130 g of egg yolk, 50 g of vegetable oil and 80 g of cold water were agitated by hand mixer until to get homogeneous mixture was obtained. Then, portion A and B were well mixed and 10 g of vanilla extract was added into this mixture. The resultant mixture was called the batter. In portion C, 250 g of egg white was beaten with electric hand mixer for 5 minutes. While beating, 4 g of cream of tartar was added and the mixture was vigorously beaten until to obtain stiff peaks form of cream. One fourth of the batter was partially added into the portion C, stiffly beaten egg white, and gently folded them by rubber spatula. The rest yolk mixture was gently poured and folded into egg white cream. Then, the mixture of soft cream and batter was poured into the 9 inch tube pan to bake it.

Finally, the oven was preheated to 180° C for about 10 minutes and then baked at that temperature for 25 minutes as shown in Figure (2). When the oven temperature was low, the cake would not be raised to its optimum stage. Bamboo stick was used to pook the cake. If it came out clean, the baking process was complete and high quality processed toddy palm chiffon cake was obtained as shown in Figure (3).



Figure (2) Baking of Toddy Palm Chiffon Cake



Figure (3) Processed Toddy Palm Chiffon Cake

Preparation of Processed Chiffon Cake without Toddy Palm Paste

In the processing of Chiffon Cake without toddy palm paste was prepared with the same procedure mentioned above. Instead of toddy palm paste, baking powder was applied in the processing of Chiffon Cake without toddy palm paste, illustrated in Figure (4).



Figure (4) Processed Chiffon Cake without Toddy Palm Paste

Results and Discussion

Table (1) shows the specific composition percentage of raw materials for the processing of chiffon cake.

Effect of weight of egg yolk is shown Table (2). The various weights of egg yolk were used to produce chiffon cake at the same baking condition. The sensory properties of processed chiffon cake containing 130 g of egg yolk were found to be precise texture and yellow colour of all other processed chiffon cakes.

From the results of Table (3), various amount of toddy palm paste were applied at the same process condition. 15 g of toddy palm paste content was found to be more attractive colour, taste and flavour of all other products.

Table (4) gives the effect of baking temperature on the quality of toddy palm chiffon cake, various baking temperatures and baking time 25 min were used. From these results, baking temperature 180°C was the most suitable temperature to give colour consistent, nice flavor and smooth texture. At lower baking temperature, insufficient baking time, wobbly texture and soft colour cake was obtained. At higher temperature, unfavorable colour and slightly caramel taste was formed. The processed chiffon cake was obtained average score of 7.2 (like very much) in sensory evaluation.

Effect of baking time is shown in Table (5), at the most favourable temperature 180 °C, various baking times were used. The most suitable baking time, 25 min was selected. At lower baking time, soft and poor conditions of chiffon cakes were produced. At higher baking times, hard and caramel taste was obtained.

Nutritional values of processed toddy palm chiffon cake with commercial chiffon cake were compared and are shown in Table (6). In occurrence with the results, the high quality product was obtained.

Table (1) Composition of Raw Materials for the Processing of Chiffon Cake
 Baking Temperature and Time = 180 °C and 25 min
 Weight of Chiffon Cake = 250 g
 Weight of Batter = 600 g/2 Chiffon Cakes
 Shelf life = up to 10 days

Sr. No.	Raw Materials	Amount (% w/w)
1	Cake Flour, CF	14.14
2	Sugar, SG	8.49
3	Baking Powder, BP	0.85
4	Salt, ST	0.28
5	Vegetable Oil, VO	7.07
6	Water, WT	11.32
7	Egg York, EY	18.39
8	Vanilla Extract, VE	1.41
9	Egg White, EW	35.36
10	Cream of Tartar, TT	0.57
11	Toddy Palm Paste, TPP	2.12

Table (2) Effect of Weight of Egg Yolk on the Properties of Processed Chiffon Cake

Baking Temperature and Time = 170 °C and 25 min
 Weight of Chiffon Cake = 250 g
 Weight of Batter = 600 g/2 Chiffon Cakes
 Shelf life = up to 10 days

Sr. No.	Egg Yolk (g)	Properties
1	110	Uneven crumb and light taste
2	120	Good texture and pale yellow colour
3	130*	Precise texture, attractive yellow colour and good taste
4	140	Slimy texture, unstable and wobbly texture
5	150	Tunnel texture and more dense

*The most suitable amount

Table (3) Effect of Weight of Toddy Palm Paste on the Quality of Processed Chiffon Cake

Baking Temperature and Time = 170 °C and 25 min
 Weight of Chiffon Cake = 250 g
 Weight of Batter = 600 g/2 Chiffon Cakes
 Shelf life = up to 10 days

Sr. No.	Toddy Palm Paste (g)	Characteristics
1	5	Cream colour and very light taste
2	10	Bright cream colour and slightly light taste
3	15*	More attractive yellow colour, excellent taste and flavour
4	20	Soft texture and soapy taste
5	25	Risen unevenly and more bitter taste

*The most suitable amount

Table (4) Effect of Baking Temperature on the Sensory Properties of Processed Chiffon Cake

Baking Time = 25 min
 Weight of Chiffon Cake = 250 g
 Weight of Batter = 600 g/2 Chiffon Cakes
 Shelf life = up to 10 days

Panelist	Baking Temperature (170 °C)	Baking Temperature (180 °C)*	Baking Temperature (190 °C)
1	6	7	6
2	8	7	6
3	7	8	7
4	6	7	8
5	7	8	7
6	7	8	7
7	6	7	8
8	7	8	7
9	7	8	8
10	8	7	8
Total Score	69	75	72
Average	6.9	7.5	7.2

Overall Acceptability = $(6.9 + 7.5 + 7.2) / 3 = 7.2$

* The most favourable condition

Table (5) Effect of Baking Time on the Organoleptic Properties of Processed Chiffon Cake

Baking Temperature = 180 °C
 Weight of Chiffon Cake = 250 g
 Weight of Batter = 600 g/2 Chiffon Cakes
 Shelf life = up to 10 days

Sr. No.	Baking Time (min)	Organoleptic Properties
1	20	Soft texture, pale yellow colour and light flavour
2	25*	Good texture, attractive yellow colour, good taste and attractive flavour
3	30	Slightly hard texture and dark yellow colour
4	35	Hard texture, light brown colour and a little bitter taste
5	40	Hard texture, brown colour and bitter taste

* The most favourable condition

Table (6) Comparison of Nutritional Values of Processed Toddy Palm Chiffon Cake with Commercial Chiffon Cake
Shelf life = up to 10 days

Sr. No.	Characteristics (% w/w)	Processed Toddy Palm Chiffon Cake	Commercial Chiffon Cake (Season)
1	Moisture	30.53	29.04
2	Ash	1.41	1.32
3	Carbohydrate	41.42	43.94
4	Protein	5.73	7.48
5	Fat	15.97	16.63
6	Fiber	0.71	0.88
7	Energy value (kcal/100 g)	332.33	355.35

Conclusion

In toddy palm chiffon cake processing, the extraction of toddy palm paste from ripen and sound toddy palm fruits was very simple. The paste was applied together in place of baking powder to leaven the batter of toddy palm chiffon cake. Furthermore, this cake has the quality of more attractive colour, flavor and good taste, especially the precise texture.

The nutritional values of processed toddy palm chiffon cake were found to be well comparable with the commercial chiffon cake (Season). So, the quality of processed chiffon cake was suitable to eat as it was mainly processed with toddy palm paste, pure grains, fresh dairy products and healthy nutrients.

Acknowledgements

We would like to mention our sincere gratitude to Dr. Thein Win, Rector (Acting), University of Mandalay, Dr. Kathy Thin, Dr. Myin Zu Minn and Dr. Mi Mi Gyi, Pro-rectors, University of Mandalay, for their permission to submit this research paper.

I would like to thank to Dr. Nilar, Professor and Head, Department of Industrial Chemistry, University of Mandalay for her permission to submit this article. I would like to express my deepest gratitude to Dr. Khin Hla Mon, Professor and Head, Department of Industrial Chemistry, Dagon University for her permission to do this research work.

References

Sultan, W. J. (1990), "Practical Baking", Fifth Edition, Van Nostrand Reinhold, VNR, New York.
European Scientific Journal January 2013 edition.vol.9, No.3 ISSN: 1857-7881 (Print) e-ISSN 1857-7431.

Websites

<http://www.craftybaking.com/learn/cakes/Introduction>
<https://www.linkedin.com/pulse/toddy-palm-fruits-seeds-products>
<https://bakerbettie.com/function-of-butter-in-baking/>
<https://www.livestrong.com/article/547557-what-does-milk-do-in-baking/>
<https://www.bakeinfo.co.nz/School-Zone/Baking-Basics/Ingredients-and-their-uses>
<https://www.livestrong.com/article/459116-can-you-replace-vegetable-oil-with-canola-oil-in-cakes>
[https://www.International Journal of Food Sciences and Nutrition June 2008; 59\(4\): 299_326.com](https://www.International Journal of Food Sciences and Nutrition June 2008; 59(4): 299_326.com)