

DEVELOPMENT OF CAVENDISH BANANA CAKE FROM JASMINE RICE FLOUR REPLACING WHEAT FLOUR

Nunyong Fuengkajornfung

Faculty of Science and Technology, Suan Sunandha Rajabhat University, Bangkok, Thailand

E-Mail: nunyong.fu@ssru.ac.th

ABSTRACT

The research: Development of Cavendish banana cake from jasmine rice flour, replacing wheat flour has objectives as follows: 1) to study the standard recipe of Cavendish banana cake; 2) to study the amount of jasmine rice flour substituting with wheat flour in the ratio of 50, 60 and 70 percent.; 3) to study chemical qualities of Cavendish banana cakes. From study of three standard formulations of Cavendish banana cake, the researcher found that consumers accepted 2nd Cavendish banana cake recipe consisting of margarine 108 grams, fresh butter 108 grams, multi-purpose wheat flour 390 grams, baking powder 2 grams, baking soda 2 grams, mashed salt 2 grams, fine sugar 157 grams, chicken egg 110 grams, refrigerated yoghurt, natural flavor 64 grams, mashed ripe Cavendish banana 320 grams. Then standard recipe is brought to replacing of jasmine rice flour in the ratio of 50, 60, 70 percent; the researcher found that replacing of jasmine rice flour of 50 percent, has the highest acceptance in terms of overall preference. Replacing jasmine rice flour in ratio of 50 percent to study the chemical quality, it was found that it had components of carbohydrate for 48.28 grams, ash for 1.15 grams, total fat for 15.45 grams, protein for 5.03 grams and dietary fiber for 1.21 grams.

Keywords: Cavendish banana, Cake and Jasmine rice flour

INTRODUCTION

Jasmine rice is a major economic crop of the country; it is aroma, sweet and good taste rice; it is popular both inside and outside the country. The output of jasmine rice will be used for domestic consumption. Most jasmine rice is sold in the form of rice that has been polished, as a result of this causes a large amount of broken jasmine rice and cannot be used widely, because jasmine rice is soft with low amylose content; most of them are processed into porridge, baby food as well as animal feed. Therefore, it should find ways to use jasmine rice more widely used (Pornwenus Panyha, 2001) [1].

During the year 2559, Thailand suffer from the problem of rice prices due to the fact that the yields of Jasmine rice is growing more than ever, on the other hand, the demand for rice has decreased. As a result, the price of rice is lower and the farmers' income has decreased. And finding solutions to help farmers in the country, jasmine rice is used to produce flour, which will have nutritious flour. The production of flour; bringing raw material is grinded into a small size, but significant nutrients still remains in all raw materials such as carbohydrates, protein, fat, fiber, minerals, which jasmine rice flour have low protein that is suitable for making cake.

At present, pastry products play an increasingly important role in Thai daily life, as the way of life of Thais changed. Especially, the city has a rush to do activities; people want something fast. This has a direct impact on the behavior of the population, especially breakfast. This is the growth channel of the bakery market. (Tidarat Sanphom, 2016) [2]

The banana cake products are unique, because of the aroma of banana. The taste is soft and sweet, the cake production is easy to make. Manufacturers do not need to have the basics for making desserts but they can produce them including banana cake as a cake which can be adapted to many forms such as banana cake etc.. In general, banana cake is used as a main ingredient, which Thailand cannot grow wheat flour. Thailand has to import wheat flour from abroad; this lost millions of dollars a year. Therefore, the researcher wants to use jasmine rice flour instead of wheat flour to make banana cake, this helps to increase channel the use of jasmine rice and reduce the import of wheat from abroad (Chalida Yod-kansri, 2007) [3].

METHODOLOGY

1. Study the standard recipes of Cavendish banana cakes.

Selection of standard recipes and methods for making banana cake ; there were 3 recipes, sensory quality assessment by acceptance test method, used 9 – Point Hedonic scale to assess the appearance, color, odor, taste, texture and overall preference; the experimental study used testers who were not trained 50

peoples, the experimental design was Randomized Complete Block Design: RCBD, analysis of variance, and compared the difference between the average by Duncan's New Multiple Range Test method at the 95% confidence level

2. Study the amount of jasmine rice flour substituting with wheat flour in the ratio of 50, 60 and 70 percent.

This study used banana cake, which was the most acceptable product in the experiment. The experiment was carried out with 3 different quantities of jasmine rice flour substituted for wheat flour in banana cake at 50, 60 and 70 percent. Used 9 – Point Hedonic scale to assess the appearance, color, odor, taste, texture and overall preference; the experimental study used testers who were not trained 50 peoples, the experimental design was Randomized Complete Block Design: RCBD, analysis of variance, and compared the difference between the average by Duncan's New Multiple Range Test method at the 95% confidence level

3. Study the chemical qualities of Cavendish banana cakes

Bring the Cavendish banana cakes in 0 (control) and the Cavendish banana cakes accepted by consumers, to study the chemical composition including dietary fiber based on a method of AOAC (2012) [4].

RESULTS

The results of Study the standard recipes of Cavendish banana cakes.

The results of the sensory quality assessment of Cavendish banana cakes found that the 2nd Cavendish banana cake recipe was the most accepted one, the appearance, color, odor, taste, texture and overall preference. The second recipe had the highest amount of mature banana. As a result, the cake was brown. The aroma of the 2nd recipe of Cavendish banana cake was very fragrant. Brown is caused by browning reaction, and the 2nd recipe contains yogurt, yogurt is a dairy product made from microbial fermentation. Acidic properties contributes to the soft texture of the cake, which helps keep the product moist, while the acidity of the yogurt causes a chemical reaction. And it would produce carbon dioxide during the product waiting to be baked. (Pradit Cumknongpai. 2012) [5]. From Table 1

Table 1
Sensory characteristics of standard recipe of Cavendish banana cakes

Sensory Characteristics	Recipe 1	Recipe 2	Recipe 3
Appearance	6.78 ± 1.55 ^b	7.58 ± 1.01 ^a	7.10 ± 1.19 ^{ab}
Color	6.92 ± 1.45 ^b	7.86 ± 0.07 ^a	6.80 ± 1.45 ^b
Odor	6.94 ± 1.51 ^b	7.58 ± 0.88 ^a	7.04 ± 1.47 ^b
Taste	6.90 ± 1.72 ^b	7.78 ± 1.28 ^a	7.54 ± 1.58 ^a
Texture	6.82 ± 1.78 ^b	7.60 ± 1.19 ^a	7.18 ± 1.27 ^{ab}
Overall preference	6.92 ± 1.41 ^b	7.66 ± 1.28 ^a	7.44 ± 1.21 ^a

Remark : Mean ± Standard Deviation

^{a,b,c...} Means with the different letters are significantly different ($p \leq 0.05$).

^{ns} Means are not significantly different ($p > 0.05$).

The results of study the amount of jasmine rice flour substituting with wheat flour in the ratio of 50, 60 and 70 percent and Control.

The sensory quality assessment of the Cavendish banana cake recipe substituted with jasmine rice flour at 0 (controlled recipe), 50, 60 and 70 percentage showed that the score of overall preference was statistically significant difference at 95% confidence level, which the Cavendish banana cake recipe substituted with 50 percentage of jasmine rice flour had the highest score of overall preference, and the score of overall preference was nearly the score of the controlled recipe. This is because of the fact that the values of amylose content in the rice flours were 18.30–33.80% (Kraithong, S., Lee, S., & Rawdkuen, S, 2018) [6]. High amylose rice can provide firmness and crispness to products due to a three-dimensional network formation (Wang, L., 2016) [7]. So, the increased amount of jasmine rice flour and ripe banana effect to cavendish banana cakes have have harder texture (Arisara Rodmui., 2007) [8]. From Table 2.

Table 2
Sensory characteristics of the amount of jasmine rice flour substituting with wheat flour in the ratio of 50, 60 and 70 percent and Control.

Sensory Characteristics	Controlled Recipe	The recipe substituted with jasmine rice flour in percentage		
		50	60	70
Appearance ^{ns}	7.80 ± 1.06	7.66 ± 1.15	7.48 ± 1.12	7.54 ± 1.01
Color ^{ns}	7.78 ± 0.95	7.74 ± 1.19	7.74 ± 1.12	7.64 ± 1.08
Odor ^{ns}	7.66 ± 1.09	7.54 ± 1.18	7.46 ± 1.16	7.40 ± 1.12
Taste ^{ns}	7.84 ± 1.09	7.72 ± 1.29	7.38 ± 1.38	7.32 ± 1.57
Texture ^{ns} (Softness)	7.60 ± 1.32	7.48 ± 1.38	7.22 ± 1.44	7.28 ± 1.57
Overall preference	8.08 ± 0.87 ^a	7.84 ± 0.99 ^{ab}	7.54 ± 1.28 ^b	7.42 ± 1.42 ^b

Remark : Mean ± Standard Deviation

^{a,b,c...} Means with the different letters are significantly different (p≤0.05).

^{ns} Means are not significantly different (p>0.05).

The results of Study the chemical qualities of Cavendish banana cakes.

The analysis of chemical quality of Cavendish banana cakes; banana cake recipe substituted with 50 percentage jasmine rice flour, the study results found that the chemical properties, in aspect of carbohydrate, ash, protein and fiber. The Cavendish banana cake recipe substituted with 50 percentage Jasmine rice flour has the increasing humid content and the decreasing fat content. Therefore, it can be concluded that Cavendish banana cake substituted with 50 percentage jasmine rice flour has more benefits. From Table 3

Table 3
The chemical qualities of the controlled recipe compared to the Cavendish banana cakes recipe substituted with jasmine rice flour at 50 percentage.

Chemical Properties (Percent)	Controlled Recipe	The recipe of 50 percentage substituted with jasmine rice flour	Unit
Carbohydrate	47.55	48.28	gram
Moisture	31.44	30.09	gram
Ash	1.08	1.15	gram
Total fat	15.55	15.45	gram
Protein	4.38	5.03	gram
Fiber	1.12	1.21	gram

Note: Analysis value by company "Central Laboratory (Thailand) and Institute of Nutrition".

CONCLUSION AND FUTURE WORK

The results of the sensory quality assessment of Cavendish banana cakes found that the 2nd Cavendish banana cake recipe was the most accepted one, the appearance, color, odor, taste, texture and overall preference.,

The sensory quality assessment of the Cavendish banana cake recipe substituted with jasmine rice flour at 0 (controlled recipe), 50, 60 and 70 percentage showed that the score of overall preference was statistically significant difference at 95% confidence level, which the Cavendish banana cake recipe substituted with 50 percentage of jasmine rice flour had the highest score of overall preference, and the score of overall preference was nearly the score of the controlled recipe.,

Study the chemical quality the jasmine rice flour in ratio of 50 percent had components of carbohydrate for 48.28 grams, ash for 1.15 grams, total fat for 15.45 grams, protein for 5.03 grams and dietary fiber for 1.21 grams.

ACKNOWLEDGEMENTS

I would like to express my sincere thanks to Suan Sunandha Rajabhat University for invaluable help throughout this research.

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