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Research paper

Consumer Preferences Onthe Sponge Cake Made of Warm Wateras A Substitute For Fat

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Abstract
This study examined the level of consumers' preference for the sponge cake made up of warm water. In the process of making sponge cake, besides flour, egg, and sugar, fat usually functions as the major component. The flavor of a cake is generally affected by the quantity of the used fat and eggs. However, fat is commonly shunned because of its negative impacts on the human body. Hence, this paper analizes the level of consumer preferences for sponge cake when fat as its main ingredient is replaced with warm water. This study employed an experimental method by which the collected data were analyzed with ANOVA. In the future, such a production of sponge cake made of warm water is expected to become an innovative and creative formulation of sponge cake desired by the consumers.

Keywords: fat and water, consumer preference, sponge cake

1. Introduction

Today, the public mindset and interest in choosing foods are undergoing many changes. In addition to good, tasty and attractive foods, they tend to choose healthy foods. Healthy and tasty food have been already sold in the market but they are quite expensive. In the case of cake products, a sponge cake is a base or basic element to create a wide variety of other cakes, such as black forest, Surabaya layered cake, and so forth. A tasty cake is highly influenced by the type of fat used.

When being made of animal fat or butter, a cake usually will have a softer texture and smell more delicious, but when being made of vegetable fat or margarine, a cake' texture will be less soft and have a yellowish color.

There are abundant recipes, methods, and techniques used in making cakes. Each has advantages and disadvantages, depending on the chef's discretion. In relation to the substitution of fat with warm water, the formulation of sponge cake production with warm water needs the right ratio between the number of eggs, sugar, flour and warm water. Furthermore, the shaking and burning require special skills to produce delicious cake products preferred by the consumers.

2. Literature Review

Cake
A cake, in a general sense, is a baked dough with the basic ingredients of flour, sugar, eggs, and fat. Furthermore, a cake can be made of additional ingredients, including salt, leavening agent, shortening, milk, and aroma enhancer. These ingredients are combined to produce a smooth crust, soft texture, attractive color, and good aroma (Faridah, 2008).
In the production of a cake, there are three factors that determine the bad or good quality of the produced cake. They are the suitability of the ingredients used, the balance of the ingredients used, and the stages of the production process in both mixing and baking. According to Faridah (2008), there are two types of the formulation of a cake, including high-fat cake and low-fat cake. Meanwhile, there are five methods of the cake production, including sponge method, two-stage method, creaming method, chiffon method, and angel food method. In this case, a cake is served in the forms of chunks or slices. It is often presented as a whole like in a party or as a garnish. A cake is made of wheat flour (main raw ingredient) with or without the addition of fat; eggs are to give the impression of soft and tasty; and sugar is to give a sweet taste which is the hallmark of this product (Herudiyanto and Hudaya, 2009).
To make a cake, the first thing to be considered is the selection of basic ingredients; all of which should have a good quality. Each ingredient has its own function that is essential for the success of a cake product (Suhardjito, 2006). The main ingredients used to craft a cake, according to (Suhardjito, 2006), include flour, sugar, fat, eggs, milk, water, and salt.
Preference Level Test (Hedonic Test)
A preference test is also called the hedonic test. The panelists were assigned to give feedback on their personal like or dislike. They also expressed the level of their preferences. The preference levels are called the hedonic scale. For example, in the case of "like", it can have hedonic scales of strongly like, like, and somewhat like. Conversely, if the response is "dislike", the hedonic scales can be like, somewhat like and neutral (neither like nor dislike).

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The hedonic scale can be stretched based on the need. It can also be converted into a numerical scale with quality scores according to the level of preference. A statistical analysis can be performed using the numerical data. In practice, a hedonic scale can be used to tell differences so that the hedonic test is often used to organoleptically assess similar commodities or developed products.

3. Methodology

The object of this study was the formulation of warm water as the fat substitution in the production of sponge cake, while the subject of this study was consumers' acceptability. This study employed 15 trained panelists, consisting of pastry and bakery chefs, a pastry and bakery lecturers, bakery entrepreneurs, and students taking concentration on the pastry. They were assigned to choose the best final products by using the comparison of control (original) products. The best products were subsequently given to 50 respondents to see their acceptability and preferences.

4. Results and Discussion

Panelists' Characteristics
As shown in table 4.1, most of the panelists are men (nine), while women are six

Table 4.1: Panelists' Characteristics by sex

	Sex	Frequency	Percentage (%)
1	Men	9	80
2	Women	6	20
Total		15	

Based on Table 4.2, the panelists' characteristics based on age are divided into three: range of 20-29 years old (four people), range of 30-39 years old (eight people), and range of 40-49 years old (three people).

Table 4.2: Panelists' Characteristics by Age

No	Age Range	Frequency	Percentage (%)
1	20 – 29	5	33.33
2	30 – 39	6	40.00
3	40 – 49	4	26.66
Total		15	100

The panelists' characteristics based on the type of profession are divided into four, including chef (seven people), student (one person), pastry and bakery businessmen (two people) and pastry and bakery lecturer (five people). As seen in Table 4.3, the highest number of panelists comes from the chef.

Table 4.3: Panelists' Characteristics by Occupation

No	Occupation	Frequency	Percentage (%)
1	Chef	7	46.66
2	College student	1	6.66
3	Businessman	2	13.33
4	Lecturer	5	33.33
Total		15	100

Respondents' Acceptability of the Developed Product
The analyzed data on the acceptability of sponge cake that is made up of warm water to substitution the fat resulted in an overall score of 1041 point as shown in Table 4.4 below.

Table 4.4: Overall Respondents' Acceptability of the Product

Score	Remark
240-480	Strongly accept
481-721	Refuse
722-962	Neither
963-1203	Accept
1204-1444	Strongly accept

The results show that the product is accepted by the respondents. The measurement of respondents' acceptability variables is described as follows:

Table 4.5: Respondents'Acceptabilityof Color

No	Response Alternatives	Frequency	Percentage (%)
1	Strongly dislike	0	0%
2	Dislike	5	10%
3	Somewhat like	13	26%
4	Like	24	48%
5	Strongly like	8	16%
Total		50	100%

Table 4.5 indicates, in term of color, most of the respondents "prefer" the sponge cake that is made up of warm water as the fat substitution (24 respondents with a percentage of 48%). In other words, the color of the cake begins to be accepted by the consumers.

Table 4.6: Respondents'Acceptabilityof Physical Appearance

No	Response Alternatives	Frequency	Percentage (%)
1	Strongly dislike	0	0%
2	Dislike	6	12%
3	Somewhat like	16	32%
4	Like	19	38%
5	Strongly like	9	18%
Total		50	100%

Table 4.6 describes that, in term of physical appearance, most of the respondents "like" the sponge cake that is made up of warm water as the fat substitution (19 respondents with a percentage of 38%). In other words, the physical appearance of the cake begins to be accepted by the consumers.

Table 4.7: Respondents'Acceptabilityof Aroma

No	Response Alternatives	Frequency	Percentage (%)
1	Strongly dislike	0	0%
2	Dislike	10	20%
3	Somewhat like	17	34%
4	Like	20	40%
5	Strongly like	3	6%
Total		50	100%

Table 4.7 illustrates, in term of aroma, most of the respondents "like" the sponge cake that is made up of warm water as the fat substitution (20 respondents with a percentage of 40%). In other words, the aroma of the cake begins to be accepted by the consumers.

Table 4.8: Respondents'Acceptabilityof Texture

No	Response Alternatives	Frequency	Percentage (%)
1	Strongly dislike	0	0%
2	Dislike	10	20%
3	Somewhat like	21	42%
4	Like	15	30%
5	Strongly like	4	8%
Total		50	100%

Table 4.8 suggests, in term of texture, most of the respondents "somewhat like" the sponge cake that is made up of warm water as the fat substitution (21 respondents with a percentage of 42%). In other words, the texture of the cake begins to be accepted by the consumers.

Table 4.9: Respondents'Acceptabilityof Taste

No	Response Alternatives	Frequency	Percentage (%)
1	Strongly dislike	0	0%
2	Dislike	8	16%
3	Somewhat like	19	38%
4	Like	18	36%
5	Strongly like	5	10%
Total		50	100%

Table 4.9 indicates, in term of taste, most of the respondents "somewhat like" the sponge cake that is made up of warm water as the fat substitution (19 respondents with a percentage of 38%). In other words, the taste of the cake begins to be accepted by the consumers.

5. Conclusions

Based on the observation, analysis, and experiment, warm water can be used to substitution fat in the production of sponge cake and can be accepted by the public. Thus, A sponge cake made of warm water instead of fat can be accepted by consumers since the product is not much different from the control/original product in terms of color, taste, aroma, texture, and physical appearance (overall aspects).

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