

The Use of Peanut Flour as A Substitute for Almond Flour in Making Macarons

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ABSTRACT

Macaron is a type of pastry that is popular in the community. The basic ingredient for making macarons cake is almond flour. Almond as a basic ingredient of flour, has a fairly expensive price, so macarons cake is categorized as an expensive pastry and has not been fully reached by the public. Another type of nut that can replace almonds is peanuts. Peanuts are easy to find in Indonesia and are spread in several provinces. The relatively cheap price of peanuts and high nutritional content can be an alternative to almond flour. The object of this study is the quality of the macarons using groundnut peanut flour. The stages of this study consist of experiments, documentation, and organoleptic tests or sensory tests. The results of this study indicate that the macarons cake made from peanut flour meets the indicators of a good macarons cake. Based on organoleptic test or test sensory, macaron peanut flour-based macarons starch peanuts have a crispy texture is very crisp, the colors are rather pale, macarons are made from peanuts have a surface that is smooth and there are no cracks, in addition pied (foot) on the peanut-based macarons are peanut-based already appear or have legs.

Keywords: Macarons Cake; Peanut Flour; Organoleptic Test

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1. Introduction

Pastries are one of the most popular types of cakes. In the process of making pastries, there are several things that need to be considered, such as understanding the ingredients, the character of the cake, and the manufacturing process (Gisslen, 2013: 483). Pastries can be found easily in cake shops, supermarkets, and even traditional markets. In Indonesia, pastries are a dish that accompanies celebrations of religious holidays, such as Eid al-Fitr and Christmas. Various types of pastries adorn the culinary industry and its audience, one of the popular pastries today is macarons.

Macarons are a type of light cake originating from Italy. This cake is categorized as a product of pastry types of meringue and has a crisp texture (crunchy) on the outside and tender on the inside. Today, macarons are pastries that have been widely known by Indonesians. Macarons consists of two shell that are glued together and filled with filling form of ganache, cream cheese, and butter cream. Almond flour is the main ingredient in making macarons.

Almond flour comes from almonds that have gone through a processing process. Almonds can be found in countries around the Mediterranean Sea, among others such as; Spain, Italy, Portugal, and Morocco, and the United States. Besides being processed into flour, almonds are also widely used as toppings and complements in cakes and breads. Almonds are widely used in food products with the aim of improving texture and taste as well as improving a healthy nutritional composition (Astawan, 2009).

To produce almonds in large quantities requires proper agricultural processes and supported by a suitable climate. In Indonesia, almond-based products still depend on the import process. Therefore, other types of beans nuts can replace the function of almonds in the process of making food such as macarons cake, although there are additions or reductions in nutritional value, texture, and taste in the process. One type of

peanut nuts that can be grown and found easily in Indonesia is peanut.

Peanuts are often consumed as a basic ingredient in cooking or just a light snack. Commodity and peanut farming are centered on the island of Java. East Java is the province with the largest peanut harvest area with a harvested area of 152.09 hectares and contributes 29.17% to the national average harvested area (Suwandi, 2015:5). However, seen from the consumption of peanuts has decreased. Peanut commodity on a large scale is found in home industries, small and medium enterprises through various processed products such as chili sauce, sweets, and other regional specialties.

In terms of nutritional value, peanuts have nutritional value that is not inferior to almonds. This will not only have a good impact on improving nutrition and public health, but also on the income of peanut farmers. Therefore, peanut flour can be used as the main ingredient for making macarons. The comparison of nutritional value between peanut flour and almond flour is as follows.

Table 1. Nutritional Content of Peanut Flour and Almond Flour Per 100 Grams

<i>Content</i>	<i>Amount</i>	
	Peanut Flour	Almon Flour
Calories (cal)	452 kcal	578 kcal
Protein	25.3 gr	22 gr
Fat	42.8 gr	51 gr
Carbohydrate	21.1 gr	20 gr
Calcium	58 gr	248 mg
Phosphorus	335 mg	378 mg
Iron	1.3 mg	3 mg
Vitamin B-1	0.30 mg	0.24 mg
Vitamin C	3 mg	0.0 mg
Vitamin A	1 IU	-
Magnesium	168 mg	275 mg

Source: Directorate of Nutrition Ministry of Health Republic of Indonesia (2001)

The nutritional comparison table above shows that the nutritional content of peanut flour is of high value and is not inferior to almond flour. Replacing almond flour with

peanut flour has great potential if it is developed. It can also contribute to an increase in peanut consumption, peanut farming, and food businesses in Indonesia. The taste of macarons cakes that are varied and can be reached by various groups is the purpose of using peanut flour as a substitute for almond flour in the process of making macarons.

2. Literature Review

This study examines the use of peanut flour as a substitute for almond flour in the manufacture of macarons. This study concerns the texture of peanut flour which is made to resemble almond flour which has the potential to be used as a substitute for almond flour and the final results obtained. The theory described in this study is peanuts, peanut flour, peanut flour-making process, pastry macarons, manufacture and standard cake recipe of macarons.

2.1 Peanuts

Peanut (*Arachis hypogaea* L.) is a legume plant that is well known and cultivated in Indonesia. Peanuts have high economic value because of their nutritional content, especially high in protein and fat (Yuliana and Ratna, 2012). Peanut seeds are rich in nutrients with fat content ranging from 44.2–56.0%; protein 17.2–28.8%; and 21% carbohydrates. Peanut seeds also contain vitamin E (tocopherol) which also has antioxidant activity (Rahmi et al, 2013).

2.2 Peanut Flour and Process of Making Peanut Flour

Flour is a form of processing peanuts. In the form of flour, peanuts will last longer when stored because of the reduced fat content during the flour manufacturing process (Yulifianti, 2015:385). The process of flouring peanuts is difficult because they have a high fat content which will cause a paste to form. One way to facilitate flouring is by various treatments such as supplementation, heating, pH manipulation (Yulifianti, 2015:385). In addition, to improve the color/appearance of flour, the

skin of the peanut also needs to be removed. One way to remove the skin from the peanuts is to first soak the peanuts in boiling water for 45 seconds, then dry them at 120 o C in an oven with air flow until the water content reaches 5.9–6.4 %. In simple terms, the process of making peanut flour is explained as follows.

- 1) Sort the peanuts to use, do not use damaged or moldy peanuts. Then wash the peanuts with clean running water and remove all dirt attached to the peanuts until clean.
- 2) Soak the well-sorted peanuts in boiling water for 45 seconds, making sure they are completely submerged.
- 3) After soaking in boiling water for 45 seconds, knead the peanuts with your hands to remove the peanuts from the skin.
- 4) Then drain on a dry cloth.
- 5) Then to get rid of the rancid smell or characteristic and raw smell of peanuts, steam the peanuts with hot steam for 10 minutes and then dry on a damp cloth.
- 6) After cool and dry, dry the peanut seeds in the sun to dry for about 3-4 days or drying can be done in an oven at a temperature of 120 o C for 20-30 minutes to reduce the moisture content in the peanut seeds to reach 5.9 – 6.4%.
- 7) After that, sieve the milling results using a 60-mesh sieve (flour sieve). The filtering result is peanut flour which is ready to be used for other foods.
- 8) For storage of peanut flour, it can be stored in a tightly closed or airtight place such as a jar.

2.3 Macarons Cake and Macarons Cake Their Making Process

Macarons cake is a snack that comes from Italy. This cake was first brought to France by Queen Catherine De Medici and her personal chef. Texture of the macaron itself is usually chewy (chewy) and solid at the top (Setyarini, 2017: 34). Macarons, which are known in France and which are circulating in the Indonesian market, are different from those in other countries. This type of macaron is called French Macaron,

shaped like 2 two rounded pieces which are spread with a filling such as a sandwich, usually in the form of ganache, cream, and fruit jam. Almond flour is used because of its distinctive taste, crunchy after roasting and fragrant aroma (Mahfiroh, 2015). Here is how to make macarons from Kathryn Gordon & Anne E. Mc.Bride in the book *Les Petits Macarons* (2011:47) using the Italian meringue method as follows.

- 1) Mix the dry ingredients (almond flour, salt, and icing sugar), once mixed, use a strainer to filter the dry ingredients.
- 2) Whisk eggs and cream of tartar for two minutes on medium speed, while whisking the eggs, heat the sugar in a small pan until it reaches 113 o C.
- 3) Mix the sugar into the eggs that have been whisked and then whisk again for four minutes until shiny, then mix into the dry ingredients and fold the dough like the letter "j".
- 4) Then pipe the dough into small balls. Before putting it in the oven, rest the macarons for 45 minutes.
- 5) Put in the oven at 145 o C for 25 minutes, then let the macarons come to room temperature so that they can be easily removed perfectly.

3. Materials and Methods ← 12pt, Times New Roman bold

The object of this study is the quality of macarons cake using peanut flour. The stages of this study consist of experiments, documentation, and organoleptic tests or sensory tests. The application of the experimental method is to make macarons cake with groundnut flour and then document the manufacturing process by making notes about the process itself. After the two methods were completed, the macarons were tested sensory or it was called an organoleptic test. The organoleptic or sensory panel test is a test with the five senses which requires a panelist in the test. The indicators measured in the sensory panel test are texture, appearance, aroma,

and taste. These indicators are adjusted to the research instrument, namely the characteristics of good macarons as follows.

- 1) Glossy smooth surface does not crack or break
- 2) The exit extrusion of pied, or foot with its width does not exceed the surface of the macaron’s neck macarons
- 3) The shell were crispy on the outside but chewy (chewy) on the inside and not hard loud
- 4) The color is not pale.

Table 2. Organoleptic Test Assessment Instruments

No	Observed Variables	Definition	Indicator
1	Crispness	The shell has a crunchy, chewy texture	When divided by two the shells are will be easily separated. There is a chewy taste to the shell (but not hard).
2	Surface	Has a smooth surface	Has a smooth surface. The surface of the macarons is not cracked or cracked.
3	Pied (legs on macarons)	Have feet on macarons	The appearance of the feet on the undersurface of the macarons. The bottom is not perforated.
4	Color	Color is not pale	Not Pale. Compatible with food coloring.

Source: Setyarini (2014)

4. Results and Discussion

The process of making macarons cake using peanut flour as a substitute for almond flour was carried out three times, both pre-experimental and pre-experimental stages. The following is an explanation of the results of macarons cake using peanut flour as a substitute for almond flour.

The third From the three times of

true-experiment or real experiments that have been conducted, producing a result of consistent results of 100% peanut flour-based macarons are produced. are made from peanuts that were consistent in every macarons are using 100% of peanut flour as a substitute for peanut flour almond . Therefore, that the results of the third true-experiment assessment will be described in a panel or sensory test:

1) Color.

From the true-experiment results, macarons using a mixture of 100% peanut flour as a substitute for almond flour have produced a pink color (tends to be bright) and not pale.

2) Crispness.

From the results of true-experimental, macarons using with a mixture of 100% peanut flour as a substitute for almond flour it already have crunchy and chewy textures on the inside of the macarons which are made from peanut flour.

3) Pied (legs on macarons)

From the true-experimental results of macarons using a mixture of 100% peanut flour as a substitute for almond flour, the macarons are judged to have pied on the underside of the macarons that which means the macarons meet one of the standards of good macarons.

4) Surface

From the results of true-experimental macarons using a mixture of 100% peanut flour, the macarons produced already have a smooth surface.

From the above assessment, it can be concluded that the results of the true-experimental stage of macarons made from peanuts as a substitute for almond flour , already meet the quality standards of macarons and already have consistent results if they are to be re-applied either in the industry or sold to generate profit or profit. Following are the results of the pre-experimental or pre-experimental stages.

4.1. Assessment Results by Panelists

After going through a series of

experimental stages, which were carried out on May 10, 2019 and May 16, 2019, the researchers then conducted a sensory test or panel test which was carried out on May 18, 2019. The panel test or sensory test was carried out to test the quality of macarons using peanut flour as the basic ingredient Soil as a substitute for almonds. To get valid data, the researchers chose to use engage one expert panelist. The researcher chose Pastry Chef Bvlgari Ketut Suyarsa as a panelist, where the panelists were selected by the researcher on the grounds that the panelists were is competent and expert in the pastry field and had a fairly good sensitivity to recognize the factors in the organoleptic test assessment or panel test. Panelists were given The panelist was given a panel or organoleptic test sheet to record the quality of the macarons using peanut flour as a substitute for almond flour in making macarons which were assessed in terms of crispness, color, surface, and pied (foot on macarons). Table 3.6 is the result of the assessment by the panelist:

Table 3. Panelist assessment results

No	Variable	Indicator	Rating/Result
			Panelist
1	Crispness	Crispy	Crispy
2	Color	Not Pale	Slightly Pale
3	Surface	Smooth	Smooth (no cracks)
4	Pied (legs on macarons)	Appearing (pied)	Appearing

Source: Processed Data (2019)

4.2. Data analysis

After conducting a panel or sensory test and getting the results obtained from the expert panelists, the authors will analyze the data by describing the quality in terms of crispness, color, surface, and pied (foot on macarons) using 100% peanut flour, as follows: This is the result of a qualitative descriptive analysis of macarons made from peanut flour.

In terms of crispness, macarons that use 100% peanut flour as a substitute for almond flour have a crunchy and chewy texture on the inside like macarons in general and are

maximized.

1) In terms of color, macarons that use 100% peanut flour instead of almond flour have the same color, which is a slightly pale pink color, this is because the macarons dough contains a little pink dye food colorant, so it is necessary to add dye food colorant so that the results of the macarons are not pale.

2) In terms of surface, macarons containing 100% peanut flour have a smooth and shiny surface, but need to be filtered and milled to get maximum results.

3) Pied (legs on macarons), in this case the macarons that use 100% peanut flour have removed the legs (pied on the bottom of the macarons) this is because the fat and water content has decreased in the peanuts due to the oven process and also during the processing drying process.

5. Conclusions

The results of the research and analysis of the data showed that the macaron-based starch peanut flour-based macarons have a very crispy texture is very crisp, the colors are rather pale, macarons are made from peanuts have a surface that is smooth surface and there are no cracks in addition pied (foot) on macarons those made from peanuts have emerged or have legs. Therefore, this means that peanut flour that uses the morphology of large-seeded peanuts has produced macarons that are in accordance with the standards or characteristics. Large-seed peanut flour also has the potential to be used as a substitute for almond flour in the manufacture of macarons.

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