

Substituting Wheat Flour to Soybean Flour in Making Pukis Cakes: An Experiment Study

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Abstract. Pukis cake is a traditional cake that has a distinctive color, namely the top of the pukis cake is yellow and the bottom is brownish. Excessive use of wheat flour can be a threat if consumed in the long term. Wheat flour can cause intestinal disorders and can also occur in anyone if consumed excessively. The results of this study, the resulting pukis cake has an appropriate level of sweetness, a softer texture although still slightly dense due to the use of soy flour, has a golden yellow color, and the aroma of the pukis cake in this study does not smell of soy so that the soy flour pukis cake can be accepted by experts.

Keywords: experiment, pukis cake, organoleptic test, soybean flour

RESEARCH BACKGROUND

Pukis cake is a traditional snack from Banyumas, Central Java, made from coconut milk, wheat flour, sugar, and yeast. This cake has a semicircular shape and a distinctive color, namely yellow on top and brownish below. Its delicious taste and distinctive aroma make this cake still popular and worthy of being developed through innovation, especially with healthier ingredients.

Wheat flour as the main ingredient of pukis cake comes from wheat and has high flexibility in food processing. However, the gluten content in wheat flour can cause health problems for some people, especially celiac sufferers and children with autism who are sensitive to gluten. Therefore, it is important to find alternative ingredients that are gluten-free.

One alternative to wheat flour is soy flour. Soybeans are known to be rich in vegetable protein, fiber, vitamins, and minerals. Processing soybeans into flour makes it easier to use in various foods and extends its shelf life. The healthy fat content in soybeans is also good for heart health.

In addition, soy flour contains isoflavones which function as antioxidants, anticancer, and are beneficial for skin health. With its high nutritional content, soybeans have great potential to be used as a basic ingredient for healthy foods that support improving community nutrition and food security.

Based on this, researchers are interested in developing healthier pukis cake preparations by replacing some of the wheat flour with soy flour. This research is presented in a thesis entitled "Experiment on Making Pukis Cakes Substituted for Soy Flour".

REVIEW OF RELATED LITERATURE

General Knowledge about Soybeans

Soybeans are a type of legume that contains high vegetable protein, a source of fat, vitamins, and minerals (Krisnawati, 2017:59). Soybeans contain 35% protein, even in superior varieties the protein content can reach 40–43%, compared to rice, corn, cassava flour, green beans, meat, fish and fresh. In addition to antioxidants, fiber also plays an important role in maintaining body health by maintaining body weight, preventing obesity and constipation, maintaining blood sugar levels, maintaining blood pressure and body cholesterol, preventing colon cancer (Suryana, 2022:30).

Soy flour is a flour made from pure soybeans. The manufacturing process begins with soaking and peeling the seed coat, drying the seeds, and grinding (Okky Pronika, 2017:8). Soy flour is a soybean derivative product, one of the binding materials that can increase the water binding capacity of food ingredients because soy flour contains starch and protein that can bind water. The process of making soy flour is 600 grams of soybeans are weighed and washed thoroughly with running water then drained. Furthermore, there are 4 treatments for drying, namely drying in the sun, drying in an oven at a temperature of 50°C, 70°C, 100°C. After being dried in the sun or oven, the soybeans are then roasted over low heat for 2 minutes, then the soybeans are ground with a blender and then sieved with an 80-mesh sieve. The finished soy flour is stored in a dry and airtight place (Suryana, 2022:31).

Food Quality Criteria

According to (Melda, 2020:15), taste is one way to choose food and drinks that are distinguished by shape, smell, texture, and temperature, and are influenced by the texture of the material because they can create smells and tastes that stimulate olfactory receptor cells or salivary glands. Meanwhile, according to (Darmi Lamusu, 2018:13), aroma is an important parameter in sensory testing which is assessed through the sense of smell and is accepted if it has a specific aroma that causes a subjective sensation. According to (Purwiyatno Hariyadi, 2022:24), texture is a combination of the properties of food ingredients that can be felt through the eyes and the senses of the skin and muscles in the mouth, such as hardness, smoothness, and elasticity of the ingredients.

RESEARCH METHOD

This research is a descriptive experiment that aims to test soy flour in processed pukis cake. Data were collected through interviews with five experts as research subjects, namely sources who provide relevant information. Meanwhile, the object of research is soy flour substitute pukis cake which is the focus of the experiment and analysis in this study. This research was conducted at STP AMPTA Yogyakarta located at Laksada Adisucipto KM 6, Caturtunggal, 55281 Yogyakarta, because the place has a kitchen with complete equipment, a special room for observation, and adequate lighting. The research implementation time is scheduled from January 20, 2025 to February 20, 2025 in order to maximize the research process and data collection.

Meanwhile, the data collection methods in this study include observation of the ingredients and process of making soy flour to determine deficiencies in making pukis cakes, interviews with experts to obtain information and suggestions regarding the experiments conducted. Documentation in the form of collecting and storing data and images as supporting evidence for the research and utilizing the internet to search for references and additional information from various sources such as articles and theses. Organoleptic testing is a testing method that uses the senses of touch, sight, smell, and

taste to assess the quality of food products in terms of texture, color, aroma, and taste. This study was conducted to evaluate the quality of broccoli flour tartlet skin based on these four factors.

RESULTS AND DISCUSSION

This study involved three stages of experiments by improving grammage and treatment of the manufacturing method, where the third experiment produced the best product and has been submitted to experts for further assessment and consideration with the composition of the recipe that has been successful.

Figure 1 Table of Tart Shell Recipe Using 100% Soy Flour

Bahan	Quantity (gr)
Soy Flour	75 gr
Instant Yeast	2 gr
Warm Water	50 ml
Granulated Sugar	45 gr
Coconut Milk	100 ml
Eggs	250 gr
Butter	30 gr
Salt	1 gr
Milk Powder	20 gr
Vanilla Essence	3 tetes
Baking Powder	1 gr

[Source: Andi Yuni Amalia, 2025]

The third experiment in this study focused on improving the formulation of soy flour pukis cake by improving the composition. In the third experiment, eggs were also added to make the texture fluffier. In addition, based on the advice of experts, the researcher also reduced the amount of salt and added milk powder and Vanilla Essence to reduce the strong aroma of soybeans. The results of the experiment showed an increase in terms of golden yellow color, soft texture, and fragrant aroma with a slight aroma of soybeans.

To evaluate the quality of the product, researchers involved 5 experts which was carried out on February 4, 2025. The assessment focused on the aspects of color, texture, taste, and aroma. The results are that soy flour pukis cakes have shown success with the right sweetness, the right aroma, and a soft texture but not as soft as using wheat flour, this shows that adjusting ingredients such as milk powder, baking powder, and vanilla essence has a positive impact on the quality of the cake. In terms of appearance, the even golden yellow color without burnt parts indicates that the temperature and baking time have been well controlled. Overall, the pukis cakes from the third experiment have met the standards expected by researchers and were accepted by experts, although monitoring is still needed so that the quality is consistent and opens up opportunities for developing flavor variants and larger-scale production.

Excerpt 1

CIn the initial experiment, the pukis cake was considered too sour and burnt due to the excessive use of yeast, while in the next experiment the taste began to

improve to sweet although slightly salty, with a texture that was still somewhat dense but better than before; suggestions were given to add powdered milk and vanilla essence so that the taste and aroma were more optimal. In the last experiment, the aroma was considered appropriate, the sweetness had been achieved, and although the texture was not as soft as pukis made from wheat flour, pukis made from soy flour was considered worthy and acceptable. **(E Interview with Chef Sulastyo as a lecturer in the pastry and bakery course at STP AMPTA Yogyakarta, February 4, 2025)**

According to Expert 1, the first experiment showed several failures such as the color of the cake being too burnt due to the use of high heat and the bitter and sour taste due to excessive yeast. In the second experiment, there was an improvement in the taste to be sweeter although still a little salty because the ratio of salt and sugar was not right, while the texture of the cake remained dense but better than before. The Expert suggested adding powdered milk to strengthen the sweet taste and vanilla essence to reduce the aroma of soybeans. In addition, the color of the cake in the third experiment was as expected, namely an even golden yellow due to the use of low heat and the right baking time.

Excerpt 2

The taste of the pukis cake was initially considered strange and unlike pukis in general, with a strong soy aroma and a texture that was too dense so that it felt draggy. It is recommended to reduce the flour or add eggs so that the texture is lighter. The sweet taste can be felt, but the salty taste is still too dominant. In the next experiment, the texture began to improve and was softer, with the right taste and fragrant aroma, and the cake could be enjoyed and was considered appropriate compared to the previous experiment. **(Interview with Chef Agus Supriyanto as Chef De Partie Hotel Aveon Yogyakarta February 04, 2025)**

CONCLUSION

Based on the results of three experiments using 100% soy flour, the best results were obtained in the third experiment according to expert assessment through organoleptic tests covering taste, texture, color, and aroma. The first experiment showed unsatisfactory results with a texture that was too dense, a strong soy aroma, and a sour to bitter taste due to the use of excessive yeast. In the second experiment, the pukis cake showed development with a sweet taste that began to match even though it was slightly salty, the texture began to expand even though it was not optimal, and the soy aroma was still dominant. The third experiment was considered successful because the pukis cake had the right sweet taste, a softer texture even though it was slightly dense, an attractive golden yellow color, and a soy aroma that was no longer dominant, so that the final product was acceptable to the expert

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