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## JACK FRUIT SEEDS AS A SUBSTITUTE FOR GREEN NUTS IN BAKPIA CONTENT

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### ABSTRACT

#### Article History

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The experiment in the study titled "The Utilization of Jackfruit Seeds to Replace Green Beans in Bakpia Filling" takes a quantitative approach. Even though jackfruit seeds contain a variety of health benefits, they are often misused or even ignored by the general public. Jackfruit seeds were used by researchers to fill bakpia. The purpose of this study is to compare the fat, perotein, and carbohydrate contents of jackfruit seed bakpia and green bean bakpia using laboratory tests, as well as to identify differences between the two types of bakpia products in terms of aroma, taste, texture, color, and production cost. The hedonic test, which is based on the respondents' evaluations of aroma, taste, texture, color, and production cost, is used in the data collection process. The

researcher asked 30 participants from Sanggrahan Pathuk, a company that makes bakpia, to complete two experiments. The independent sample t-test and Excel t-test two-sample assuming equal variances are the analytical techniques used to distinguish respondents' ratings from each aspect. There are no significant differences for taste, color, aroma, or texture; the t-values are 0,39, 0,39, 0,93, and 0,00, respectively, which are smaller than the t-table value of 2,05; however, there are significant differences for production costs; the t-value is 4,48, which is higher than the t-table value of 2,05. These results can be explained by using the independent sample t-test and the Excel t-test two-sample assuming equal. With the exception of production costs, it can be said that there is no discernible difference between bakpia filled with jackfruit seed and bakpia filled with green beans.

**Keyword:** bakpia; green beans; jackfruit seeds

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### INTRODUCTION

Bakpia Pathuk is one of Yogyakarta's well-known culinary specialties, claims (Latifa & Farhan, 2013). The term "bakpia" actually originates from China and was first made in Yogyakarta's Pathuk village in 1948 under the name "Tau Luk Pia," which means pia cake or green bean cake. Back then, unbranded besek-packaged bakpia was still sold in retail settings. There are still few Bakpia fans, but the process continues until it progresses. The emergence of bakpia-bakpia with a variety of



flavors and trademarks started in 1980, along with a new appearance with a trademark based on the house number. Since 1992, due to the quick development, this memento cake has gained immense fame (Widyanto et al., 2022).

Because jackfruit seeds are still rarely used, the author tries to experiment with making bakpia with jackfruit seeds instead of green beans because he believes this will give the bakpia a distinctive flavor.

### **Nangka (Jackfruit)**

As stated by (Sindumarta, 2012) both the fruit and the tree type are referred to as jackfruit. The *Artocarpus heterophyllus* jackfruit tree is a member of the Moraceae family. Nangka is referred to as jackfruit in English. The wild species of jackfruit are found growing sporadically in the region of the western Ghats in India, which is where it is thought that the fruit first appeared. Jackfruit has now become widely distributed throughout many tropical areas, particularly in Southeast Asia. Jackfruit trees typically grow to a height of 20 meters, though some can reach 30 meters. The cylindrical stem has a diameter of up to one meter. When exposed, the crown is broad, rounded, and dense. When harmed, the entire plant secretes a thick, white sap. uses and yields the fruit of the jackfruit is the main crop harvested. Ripe "flesh" is frequently consumed fresh, combined with ice, mashed to make a juice drink, or processed into a variety of local foods like jackfruit dodol, compote, jam, fried flour made from jackfruit, chips, and so forth. As honey-jackfruit, concentrate, or flour, jackfruit is also utilized as an aroma for ice cream and other drinks.

Jackfruit (*Artocarpus heterophyllus*), which originated in southern India, is cultivated all over the world, including Indonesia. The distribution and development of this fruit plant are more frequently found in tropical climates because it is a member of the tropical plant genus. This fruit's existence is year-round. Jackfruit is relatively common and can be found almost everywhere in Indonesia. Although it is also known to be able to bear fruit at latitudes as high as 30, jackfruit grows in tropical climates up to latitudes of 25° north and south. This plant prefers regions with more than 1500 mm of annual rainfall where the dry season is not too severe. Jackfruit cannot tolerate cold temperatures, droughts, or flooding well enough (Rukmana, 2002).

When the jackfruit tree is two to eight years old, it starts to bloom. While those grown in a greenhouse start to bloom between 2 and 4 years of age. Jackfruit can produce fruit all year long in the right environment. The harvest takes place between January and August in Thailand and India, but between April and August or September and December in Malaysia. Jackfruit and cempedak can naturally crossbreed. The hybrid fruit is known as jackfruit cempedak (Sindumarta, 2012).

The advantages and negative effects of eating jackfruit are as follows (Ranasinghe et al., 2019); (1) Can prevent heart disease because potassium can lower high blood pressure or hypertension, which is thought to be effective in lowering the likelihood that the body will develop heart disease; (2) Can be used as a treatment for asthma, boiled roots and jackfruit extract can actually be used as herbal asthma medications; (3) Can prevent anemia, the iron content in jackfruit can prevent anemia and can improve blood circulation in the body; (4) Is capable of caring for the thyroid gland; (5) Supports bone health Jackfruit's high magnesium content is excellent for bones; (6) Has the potential to fight cancer and delay the

onset of aging; (7) May serve as an energy source; (8) May be used as a treatment for ulcers or digestive issues; (9) Maintains eye and skin health; (10) Can reduce blood pressure (hypertension).

But excessive jackfruit consumption will have negative effects (Mas Ad, 2022); (1) Consuming jackfruit will cause chronic ulcer disease to recur in those who already have it; (2) Might result in allergic reactions; (3) Can cause people with blood disorders to coagulate or clot more readily; (4) May alter a diabetic's glucose tolerance level; (5) The high fiber content may interfere with digestion and result in abnormal stool conditions, which is reason number five; (6) May result in gas, diarrhea, and flatulence; (7) Boost fetal temperature and induce early contractions. Avoid eating too much jackfruit and stay away from it if you have certain diseases.

### **Jackfruit Seeds**

Although a small number of people process jackfruit seeds to be used as food, such as boiling them for snacks, jackfruit seeds are a component that are frequently wasted after consumption. Such processing is still too widespread and unappealing for the general populace to consume. Consequently, jackfruit seeds are frequently discarded (Wirakusumah, 2015).

The jackfruit fruit is oval in shape, small (less than 3.5 cm (3-9 grams), and comes in two pieces. The average jackfruit contains seeds that account for about one-third of the fruit's weight; the remaining portion is made up of the fruit's skin and flesh. Each jackfruit fruit can contain 150–350 seeds, each measuring between 3.5 and 4.5 cm in length. As of right now, jackfruit seeds are still a non-economic resource and a consumer waste. Jackfruit seeds have three layers of skin: the outer, slightly supple yellow skin, the white clay skin, and the brown epidermis that envelops the fruit flesh (Rukmana, 2002).

Jackfruit seeds contain a lot of nutrients, particularly in the form of carbohydrates, potassium, phosphorus, and fat. People in South Asia can choose to make jackfruit seeds as a snack to stave off hunger because the energy content (165 kcal) and carbohydrate content (36.7 kcal) of jackfruit seeds are quite high when compared to the same content of young jackfruit and ripe jackfruit. The oil content of jackfruit seeds is 11.39% (Sindumarta, 2012).

Although jackfruit seeds, also referred to as "Beton" can be boiled and eaten as an additional source of carbohydrates, they are still infrequently used and occasionally still go to waste (Wirakusumah, 2015).

Even though jackfruit seeds have a fairly high nutritional content—36.7 g of carbohydrates, 4.2 g of protein, 165 kcal of energy, and 200 mg each of phosphorus, calcium, and iron—they are one of the organic wastes that have not been used to their full potential. Due to their high carbohydrate content, jackfruit seeds have a lot of potential for use in flour production. Protein, fiber, vitamins, antioxidants, calcium, and other natural substances are abundant in jackfruit seeds. so that when jackfruit seeds are transformed into different kinds of food, the benefits can be obtained (Sindumarta, 2012).

## Mung Beans

One variety of palawija that is well-known in the tropics is mung bean (*Vigna radiata*). This plant, which is a member of the Fabaceae family of plants, is a valuable source of high-vegetable protein foods in daily life.

After soybeans and peanuts, mung bean is the third-most significant food crop grown from a legume in Indonesia. The seeds are the most valuable component of the economy. Green bean seeds are either eaten directly or boiled until soft and then added to porridge. Onde-onde, bakpau, and gandas turi are filled with ground mature seeds. Bean sprouts, also known as green bean sprouts, are a popular vegetable in East and Southeast Asia.

When green beans are boiled for a sufficient amount of time, the beans break and the starch from the seeds emerges, thickening into a porridge-like consistency. Mung bean seed flour, also known as hunkue flour in the market, is used to make pastries and has a gel-forming tendency. Additionally, this flour can be used to make the noodles known as soun (Triwitono et al., 2017).

The advantages of green bean seeds are as follows because of their high nutritional value (Susanto & Saneto, 1994); (1) Green beans have a relatively high protein content and are a good source of important minerals like calcium and phosphorus, while their fat content is made up of unsaturated fatty acids; (2) Green beans' calcium and phosphorus content is beneficial for building stronger bones. Green beans are also low in fat, which is excellent for people who want to avoid eating foods high in fat; (3) Green bean-based foods and beverages are difficult to smell due to their low fat content; (4) The fat found in mung beans is made up of 27% saturated fatty acids and 73% unsaturated fatty acids. Nuts typically contain a lot of unsaturated fats. For the maintenance of heart health, a high unsaturated fat intake is important; (5) Vitamin B1 found in green beans is beneficial for male growth and vitality. Therefore, green beans and products derived from them are excellent choices for newlyweds to eat; (6) It is advised that children and new mothers consume green beans because they also contain multiple proteins that help the body's cells grow and replace dead ones.

Tabel 1.1 Content Comparison (/100gr)

Component	Content Jackfruit Seeds	Content Green Bean Seeds
Air (g)	57,7	10,0
Kalori (Kal)	165,0	395,0
Protein (g)	4,2	22,2
Lemak (g)	0,1	1,26
Karbohidrat (g)	36,7	62,9
Kalsium (mg)	33,0	125,0
Fosfor (mg)	1,0	320,0
Besi (mg)	200,0	6,7
Vitamin A (SI)	0,0	157,0
Vitamin B (mg)	0,2	0,64
Vitamin C (mg)	10,0	6,0

Source: (Setyawati, 2017; Susanto & Saneto, 1994)

## **Bakpia**

One of Yogyakarta's well-known culinary specialties is called bakpia, which is a dish made of flour-wrapped green beans and sugar that is then baked. The word "bakpia" originates from Hokkien, specifically from the words "bak," which means "meat," and "pia," which means cake. Bakpia is literally bread that has been filled with meat, but as it has evolved, it has been modified with other types of fillings, including green beans, purple sweet potatoes, chocolate, and cheese. Bakpia is typically round and baked (Latifa & Farhan, 2013).

The Minister of Education and Culture of the Republic of Indonesia officially recognized bakpia as an Intangible Cultural Heritage of the Special Region of Yogyakarta on October 27, 2016 (Hadi & Utama, 2017).

The people of Yogyakarta should be grateful for this honor. Because Bakpia has a compelling story of its own, it was selected as a cultural heritage. In addition to Yogyakarta, bakpia can be found in Surabaya and Bali, among other places. The three regions each put forth bakpia as a component of their regional cultural heritage. However, Yogyakarta's bakpia has been selected because of its significant meaning and history.

Because this snack was initially created by the minority and is despised by the majority, bakpia is a representation of pluralism. Over time, bakpia has gained popularity throughout Indonesia and has come to symbolize Yogyakarta.

The first form of bakpia was a substantial Tong Cu Pai moon cake, which was baked by several Chinese ancestors and contained meat. then continued to adapt to the Yogyakarta people's language. Initially made with large-shaped meat, bakpia is then made with small green beans.

At the moment, bakpia is beginning to grow and transform into an industrial field. In addition to green beans, bakpia is available with a variety of other ingredients, including cheese, chocolate, and others. Now, finding bakpia is simple (Latifa & Farhan, 2013).

## **METHOD**

The goal of a research method is to investigate a situation from a cause and the effects of a unique circumstance; the situation can be a phenomenon or a variable.

As a result, the research method can be understood as a straightforward approach to conducting research. In addition, (Sugiyono, 2014) describes the research methodology as a scientific approach to gathering data for specific goals and uses. This definition enables the formulation of four key terms: scientific method, data, purpose, and usability.

## **RESULTS AND DISCUSSION**

### **Experiment Implementation Stage**

frame of reasoning is formed by the framework of thought. The stages of the research are rationally explained using the framework of thinking. Additionally, the

framework of thought serves to ensure that the research continues to use the established research basis. The framework of thinking was developed in relation to the title that was mentioned, which was "Analysis of the use of jackfruit seeds as a substitute for green beans."

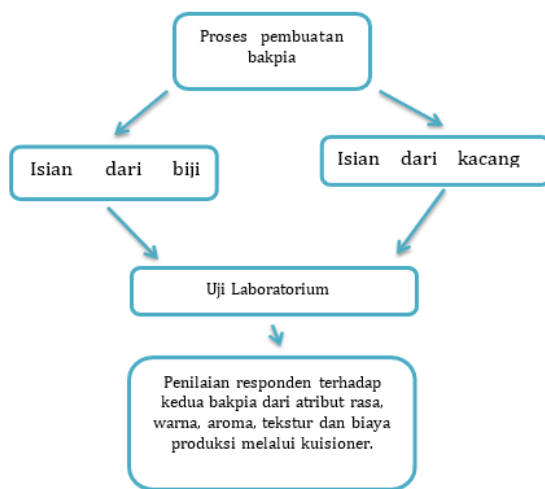


Figure 1.1 Framework of Thinking  
Source: author data processing

### Types of Research

A quasi-experimental design using a quantitative approach was used in this study. As stated by (Sugiyono, 2014). There were quasi-experiments conducted. to contrast jackfruit seed-stuffed bakpia with green bean-stuffed bakpia. A questionnaire instrument with a hedonic scale that was distributed to respondents was used in the quantitative approach, and the results of analysis and descriptive interpretation as well as analysis of the independent T-test were also analyzed. 30 respondents will be used in this study.

The steps that must be taken long before the experiment is conducted in order to collect the data that will enable an objective analysis and conclusions that are relevant to the topic under discussion are known as the experimental design (Sugiyono, 2014).

### Data Analysis Method

The data analysis method is the process of methodically searching or compiling the data obtained from the test results by organizing the data into categories, describing it into units, synthesizing, compiling into patterns, choosing which ones are important and which ones will be studied, and coming to conclusions in order to address research problems in a way that is understandable to themselves and others (Sugiyono, 2014)

Variable Feasibility Test, the author expresses his unique reaction to taste, aroma, color, and texture in this test. Likes and dislikes are one possible form of response. The way the examiners were conducted involved the use of a questionnaire and the simultaneous presentation of both bakpia to a panel of 30 individuals who were asked to provide an evaluation expressed in numerical form (hedonic scale), specifically stating that:

Table 1.1 Data Analysis Method

SE, SM, SL, dan SH	4
E, M, L, dan H	3
TE, TM, TL, dan TH	2
STE, STM, STL, dan STH	1

Analysis Method Type, (Santosa & Hermawan, 2020) asserts that in contrast to the related sample group in the t test, which receives the same treatment, the free sample t test subjects the sample group to a different treatment. Two distinct sample groups were used in the free sample t test, but they were treated equally. The t-test is the method used to test research hypotheses.

There are two ways to determine whether there is a significant difference between the jackfruit seed and green bean bakpias, namely; (1) Comparing the T-count value and the T-table value. There is a big difference if T-count exceeds T-table; (2) Directed by the probability value. A significant difference exists if the probability value is less than 0.05.

## CONCLUSIONS

The following conclusions can be made based on the analysis of the research data. According to the independent sample T-test, the results on the taste aspect have a significance value  $> 0.05$ , or  $0.430 > 0.05$ , and the Excel-based t-test returned a t-count result of 0.39 2.05 t-value tables.  $H_0$  is thus approved while  $H_a$  is denied. Therefore, it can be concluded that, in terms of taste, there is no discernible difference between the jackfruit seed and green bean bakpia

According to the independent sample T-test, the results on the color aspect have a significance value  $> 0.05$ , specifically  $0.430 > 0.05$ , and the t-test performed using Excel yields a t-count result of 0.39 2.05 t-value tables.  $H_a$  is therefore accepted while  $H_0$  is rejected. Therefore, it can be concluded that from the perspective of color, there is no discernible difference between the jackfruit seed bakpia and the green bean bakpia

The results on the aroma aspect show a significance value  $> 0.05$ , or  $0.064 > 0.05$ , according to the independent sample T-test, and the t-test conducted using Excel yields t-count values of 0.93 2.05 t-value tables.  $H_a$  is therefore accepted while  $H_0$  is rejected. Therefore, it can be concluded that, in terms of aroma, there is no discernible difference between the jackfruit seed bakpia and the green bean bakpia.

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