



## Sensory Preference of Vegan Taco with Young Jackfruit as a Substitute for Beef

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### Abstract

**Purpose of the study:** This study is designed to intricate realm of sensory preferences related to beef tacos infused with young jackfruit as a viable substitute for traditional beef. By scrutinizing these preferences, the research seeks to illuminate consumer inclinations, offering nuanced insights into the acceptance of alternative meat options, particularly within the context of this widely favored dish.

**Design/methodology:** Employing a comprehensive approach, this research seamlessly integrates qualitative and quantitative methods. The study meticulously evaluates the organoleptic qualities and acceptability of beef tacos infused with jackfruit. Through a nuanced exploration, the research aims to provide a holistic understanding, blending the subjective and objective dimensions, to capture the diverse facets of consumer response to this innovative culinary adaptation.

**Findings:** The study uncovered a favorable sensory preference for beef tacos incorporating young jackfruit, emphasizing its potential as a delectable substitute for traditional beef. Notably, it also highlighted the practical advantage of a shorter cooking time compared to beef, adding a dimension of efficiency to the culinary appeal of using young jackfruit in this context.

**Research limitations/Implications:** This study provides valuable insights into the potential of young jackfruit as a meat substitute in culinary applications, particularly in taco preparation. The findings may be beneficial for researchers, chefs, and those interested in sustainable and plant-based culinary innovations. The study's limitations include a focus on specific taste preferences and the need for broader culinary applications.

**Novelty/Originality of the study:** This research contributes to culinary innovation by showcasing a novel application of young jackfruit as a sustainable and plant-based alternative to beef. The study advances existing knowledge by demonstrating the versatility of jackfruit in recreating the sensory experience of traditional meat-based dishes, offering a promising avenue for those exploring eco-friendly and healthier dietary choices.

## INTRODUCTION

Healthy eating patterns are increasingly popular in Indonesia, especially with increasing awareness of the health benefits. Veganism, as a form of healthy eating, receives special attention. Veganism, which does not consume animal meat and its derivative products, is increasingly recognized as a lifestyle that supports health and sustainability. The World Vegan Organization (WVO) and Vegan Society of Indonesia (VSI), reported a significant increase in the number of vegetarian and vegan people worldwide, reaching around 700 million people. The trend of healthy eating, especially veganism, is increasingly popular in Indonesia. This phenomenon is reflected in the surge in vegan eating places in Indonesia, which has increased up to 40 times (Tiofani & Aisyah, 2021).

In the shift towards healthy lifestyles, beef alternatives are taking center stage, with young jackfruit becoming an attractive option. Young jackfruit is rich in fiber, vitamins, and minerals, supporting overall health. Research shows that young jackfruit is effective in fighting disease and improving health (Nisa, 2013). The fiber, vitamins and minerals in young jackfruit support overall health. Young jackfruit has a balanced nutritional composition, high in carbohydrates and fiber, and low in fat and protein. Its unique physicochemical properties make jackfruit effective against diseases such as cardiovascular disease and some types of cancer, as well as improving oral and skin health (USDA, 2016). The availability of young jackfruit is increasingly widespread in various places, from food

stores to traditional markets. Research shows that young jackfruit, used in vegan diets, provides a healthy alternative with exceptional phytochemical content, including ascorbic acid, phenolics and flavonoids (Keerthana et al., 2022). In the culinary field, young jackfruit has been proven to be a successful substitute in several studies, such as those conducted by Abdullah 2017, Ghangale et al., 2022, and Uruakpa et al., 2021 prove that young jackfruit has been a successful substitute for beef and is well-received by consumers.

Tacos, a popular global dish, have great potential by using young jackfruit as a base ingredient. Indonesia, with its wealth of natural resources, can utilize local jackfruit production to support the farmer's economy. With unique tastes and the increasing vegan trend in Indonesia, tacos made from young jackfruit can be a delicious and sustainable choice. The potential for success is influenced by smart marketing, an emphasis on cleanliness, and sustainability, making this innovation an attractive and successful alternative in Indonesia's growing culinary market (Safkaur, 2021). Tacos, a simple yet delicious global dish, provide a great opportunity to utilize young jackfruit as a base. Indonesia, with its wealth of natural resources, can support local farmers by taking advantage of its abundant jackfruit production. In the context of the increasing vegan and vegetarian trends in Indonesia, tacos prepared with young jackfruit are an appealing option. Consumers who are concerned about the environment and their own well-being are drawn in by thoughtful promotions, a focus on cleanliness, and sustainability (Handojo & Andreas, 2015). The soft and naturally sweet taste of young jackfruit provides an interesting variation for culinary lovers in Indonesia. Tacos prepared with immature jackfruit have a lot of promise to be successful in Indonesian markets because of the fruit's distinct flavor, the utilization of local supplies, and responsiveness to global trends.

The author used this information as inspiration to make beef tacos, substituting young jackfruit for the beef. It is anticipated that this innovation will draw attention from consumers in the expanding Indonesian culinary sector in addition to offering a healthier substitute. This research will explain the reasons for using young jackfruit as a substitute for beef, emphasizing the health aspect. Health is one of the factors influencing this trend. Young jackfruit is rich in fibre, vitamins and minerals which are good for health. The use of young jackfruit in vegan foods provides a healthy alternative that can be enjoyed by consumers who are concerned about their health.

## LITERATURE REVIEW

### **The Trend of Healthy Food and the emergence of jackfruit in substituting Meat-based Meals**

According to Vegan Society of Indonesia (VSI) and the World Vegan Organization (WVO), veganism is becoming more and more popular every year. According to Susilo and Smith, 2023 there are about 700 million vegetarians and vegans in the globe today. Furthermore, Indonesia has experienced a rise in the popularity of vegetarian and vegan cuisine. The number of vegan restaurants in Indonesia has expanded by 40 times, reflecting the country's growing vegan population. In recent years, eating habits that promote health have gained popularity in Indonesia. People who maintain a healthy diet typically steer clear of unhealthy foods. Among them, one is vegan. In addition to being a type of healthy eating habit, the term "vegan" generally refers to those who only eat plant- or vegetable-based meals instead of animal meat and its by-products.

### **The emergence of jackfruit in substituting Meat-based Meals**

Indonesia is recognised for having an abundance of natural resources, one of which is jackfruit. Amid these changes, one area of increasing interest is the trend of healthier and more sustainable alternatives to food sources, especially beef substitutes. In recent years, young jackfruit has become an attractive substitute for beef in many dishes. A research by Shafiq et al. (2017) on the phytochemical and nutritional properties of jackfruit shows that jackfruit is rich in ascorbic acid, phenolics (239.87 mg GAE/100g dry weight) and flavonoids (109.94 mg QE/100g dry weight). Jackfruit is high in carbohydrates (13.08%) and fibre (6.32%) but lower in fat (5.63%) and protein (1.48%). Additionally, various physicochemical properties make jackfruit effective against diseases such as cardiovascular diseases and, the development of certain cancers; and also improves oral and skin health (Rukmana, 2017). Apart from that, the availability of young jackfruit as a substitute for beef is increasing in food shops, supermarkets and traditional markets.

Aside from that, Indonesians have an appreciation for unique, appealing, and healthful food (Astawan, 2004). For Indonesian gourmets, young jackfruit offers an intriguing diversity with its naturally sweet taste and delicate texture. Therefore, young jackfruit, a common tropical fruit, can offer a unique and appealing flavour. Several

studies of earlier research have demonstrated that jackfruit could be used in place of beef such as from Abdullah (2017), Ghangale (2022), and Uruakpa et al. (2021). These research findings indicate that young jackfruit has succeeded in taking the place of beef and that many customers find it to be tasty. By those findings, it is easily found that jackfruit has been used as an alternative in substituting the animal-based meals. Moreover, according to Sadya, 2023, Indonesia will produce 813,756 tonnes of jackfruit in 2022. Considering the pattern, Indonesia's jackfruit output would become more erratic. In 2021, the jackfruit produced was 906,514 tonnes. With 176,077 tonnes or 21.64% of Indonesia's total jackfruit production in 2022, East Java is expected to emerge as the country's jackfruit. Having to look at those data, it is possible to develop jackfruit as an alternative to animal-based meals.

### **Tacos one of World Popular Dishes**

Throughout the world, tacos are a highly well-known and beloved food, particularly in Latin American and American nations. It is obvious how extensively consuming tacos have become due to the fact that they may be found in large cities outside of Mexico. Furthermore, local adjustments, which take into consideration the tastes and materials available in various nations, are reflected in filling variances. Tacos are a simplistic but delightful delicacy made of a tortilla shell stuffed with a variety of fillings, most commonly meat. This established dish has had its origins in Mexican culture and has spread throughout the world's culinary traditions. Tacos are considered as unique cuisine due to the variety of fillings available. While beef is the most often used main ingredient, other ingredients that can be used in taco varieties include chicken, pork, fish, and vegetables. The effects of eating certain foods, especially beef, on the environment, human health, and sustainability have come to mind more and more in recent years. For those who live such a lifestyle, tacos prepared with young jackfruit can be an appealing and nutritious choice. Consumers who are concerned about their health and the environment may be attracted to young jackfruit tacos if sufficient promotion is done and sustainability as cleanliness are emphasised. Finding more sustainable and healthier alternatives for the main ingredient in dishes like tacos has grown increasingly common as a result. Young jackfruit will therefore be used as a taco basis, leveraging local resources and boosting the income of local farmers. Promoting tacos that utilise young jackfruit in Indonesia has the potential to be successful and draw attention from the nation's expanding culinary market by combining the unique flavour of young jackfruit, the abundance of local natural resources, and a response to global cuisine trends.

### **METHODOLOGY**

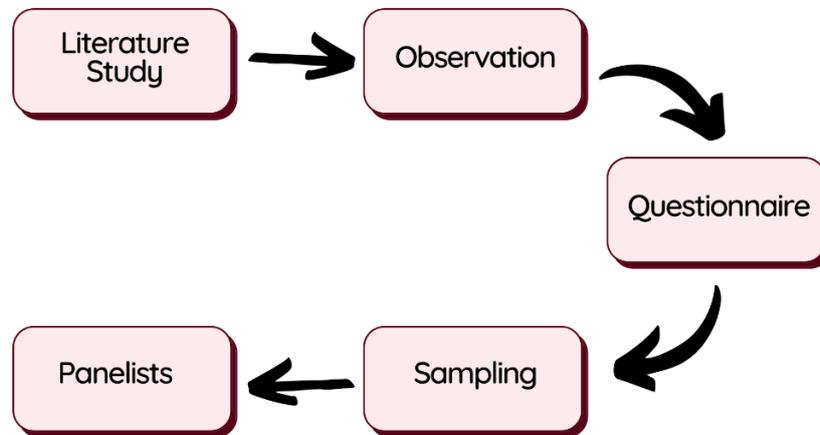
The primary research methodology used for this study was the experimental research method. According to Sugiyono, (2013), the experimental research method may be defined as a technique utilized for determining the impact of a certain treatment on other treatments within controlled parameters. We're going to aim to experiment by using jackfruit as opposed to the traditional taco filling and boiling it in three different ratios. Specifically, for thirty, forty, and sixty minutes. The initial study carried out pre-experiments from June 2023 to September 2023. Experiments, however, frequently fail to reflect the end product of research. Nonetheless, the outcomes of the conducted experiments provide identification solutions, which were earlier mentioned as a solution to the research topic (Putra, 2016).

#### **Data analysis**

The data collection methods employed in this study encompass a variety of appropriate methods (See Figure 1). A critical initial phase in collecting data, referencing sources, and establishing the theoretical basis for research is a literature review. According to Zed, (2008), this method includes techniques for collecting library data as well as reading, recording, and analyzing research resources. Another helpful method is observation, which enables authors to observe, point out, and record research-related events or phenomena. During the experiment, observation techniques will be used, and the outcomes will be documented as a starting point for enhancing the quality of the final product.

Respondents to both open-ended and closed-ended questions will be involved in the data collection process through a questionnaire. According to Sugiyono, (2019), questionnaires give respondents a chance to express their thoughts about the research issue. After the author provides samples, the respondents will provide their opinions. In order to choose a sample that is representative of the population as a whole, sampling is an essential step in the data collection process. According to Sugiyono, (2019), the sample reflects the size and makeup of the population. The panelists, who included both consumer and professional panelists, were chosen to offer an

in-depth analysis of taco products created from young jackfruit. The five expert panelists were chosen from among Bandung's Mexican culinary experts, while the consumer panelists were chosen from the wider community who evaluated the product based on fairness and honesty standards. Twenty-five consumer panelists will be chosen at random to provide a representative sample for the assessment. These data conclusions will be analyzed to present a generic representation of taco products developed from young jackfruit.



**Figure 1:** Flow of Data Analysis

## RESULTS

### Preparation of young jackfruit filling

Based on the Recipe of Taco Young Jackfruit in Table 1. Preparation took ten minutes, first by boil young jackfruit with a small amount of salt. Then drain and give it a clean wash. Three times, the young jackfruit is boiled for the same amount of time. Next, shred the juicy, young jackfruit. The young jackfruit should be shredded and seasoned with ground cumin, smoked paprika powder, oregano, Cajun powder, vegan stock powder, nutritional yeast, salt, sugar, pepper, and water after the garlic and onions have been sautéed. For the young jackfruit, adjust the cooking time according to the given time ratio. Afterwards, chop the coriander leaves, cut the tomatoes and red onions into medium dice, season with sugar and salt, and stir until well combined to make the tomato salsa. subsequently, toast the taco shell until it begins to turn a light shade of brown. The cooked young jackfruit and tomato salsa should then be added on top.

**Table 1:** Recipe of Taco Young Jackfruit

No	Method	Quantity	Ingredients	Explanation
1	Prepare			<i>Mise en place</i>
		250 g	Young Jackfruit	
		100 g	Onion	Chop
		50 g	Garlic	Chop
		20 g	Cumin Powder	
		20 g	Smoke Paprika Powder	
			Oregano	
		20 g	Cajun Powder	
		20 g	Vegan Stock Powder	
		20 g	Nutritional Yeast	
			Water	
		20 g	Tomato	
		250 ml	Cilantro	
		80 g	Red Onion	Medium Dice
		8 g	Taco Shell	Chop
		45 g	Salt	Medium Dice
		8 pcs	Pepper	
		To taste	Sugar	

2	Boil	Young Jackfruit Salt	For 10 minutes and repeat 3 times.
3	Shred	Young Jackfruit	Into small shreds.
4	Sauté	Garlic Onion	Until fragrant and the color turns brown.
5	Add	Young Jackfruit Cumin Powder Smoke Paprika Powder Oregano Vegan Stock Powder Nutritional Yeast Water	Mix well.
6	Add Seasoning	Salt Pepper Sugar	Mix well.
7	Set it aside		
8	Make Tomato Salsa	Tomato Cilantro Red Onion Salt Sugar	Stir until evenly mixed.
9	Toast	Taco Shell	Until the color turns slightly brown.
10	Add	Young Jackfruit Filling Tomato salsa	On top of a taco shell.
11	Serve		Hot

Adapted from: Hamidah & Komarian, 2018

### Expert panelist Judgements

For this experiment, we have tested this young jackfruit taco product on 5 expert panelists to give a score to this product. We asked for help from expert panelists who are experienced and able to assess products because they have trained sensitivities. We carried out this organoleptic test at one hotel in Bandung. We provide 4 assessment indicators for this organoleptic test; the following is an explanation for each assessment indicator:

1. Appearance: a judgment about the color of the product, where a higher number indicates a darker color (dark brown). Color matching is an assessment of the degree to which colors match or balance, where a higher number indicates a better degree of color matching.
2. Aroma: assessment of the level of spice fragrance/ spice aroma in the product conclude the. Evaluation of the meat-like fragrance of the product.
3. Flavour: assessment of the level of savoury taste in the product. Follow by an assessment of the balance of the product's taste, where a higher number indicates a better balance of taste.
4. Texture: assessment of the level of elasticity of the fibre in the product (fibrous). An assessment of how chewy the product is when chewed.

Assessment is carried out by giving a score to each indicator, where a score of 1 is "very poor", 2 is "poor", 3 is "average", 4 is "good", and 5 is "very good". A higher score indicates better quality according to the established assessment criteria. This assessment helps to evaluate various organoleptic aspects of the product under test and provides a deeper understanding of product quality based on certain indicators.

Taco products made from young jackfruit received the spotlight in sensory tests conducted by expert panellists. In terms of appearance, this product has succeeded in generating an impression similar to conventional tacos, especially in terms of the young jackfruit filling that looks like beef in general tacos. However, panellists cautioned that beef tacos often benefit from additions such as cheese, and they recommended improving fit and colour combinations to make young jackfruit tacos more visually appealing. The aroma aspect of this product was

considered good by the panellists. The aroma of the spices fills the air as soon as the container is opened, providing a captivating sensory experience. Even though the scent was not overpowering, the panellists were surprised when they detected a meaty scent. However, this meaty scent is seen to be an intriguing and perplexing extra dimension. Every panellist agreed that the taste of this young jackfruit taco product was excellent. But there was a comment on cumin usage from one of the panellists. He cautioned against using an excessive amount of cumin because, in his opinion, the author used too much of it, generating a rather strong, spicy aftertaste.

The expert panellists gave the product's texture ideal marks. They were impressed that young jackfruit had the potential to produce a texture that was identical to beef, particularly in terms of fibre content. There have been indications, nevertheless, that prolonged cooking times seem to lessen the jackfruit's chewy texture. For this reason, it's advised to be mindful of cooking techniques to preserve the intended chewy texture. This sensory test highlights the immense potential of young jackfruit-based taco products as a palatable and appealing substitute. Though colour, taste, and texture have been noted, the positive feedback from knowledgeable panellists indicates that this idea has potential for advancement. By enhancing colour, modifying seasoning amounts, and refining cooking techniques, young jackfruit taco products could emerge as an appealing alternative for customers seeking to add variation to their diet. Collecting feedback from consumers and experts regularly can be crucial to producing products that meet customer preferences as well as quality standards.

### Responds from the consumer

This survey was conducted to gain an in-depth understanding of consumer preferences for young jackfruit tacos and was conducted involving 30 consumer panellists in Lembang. The choice of Lembang as a survey location was motivated by its status as a tourist destination that is often visited by tourists from various backgrounds. In a tourist environment like Lembang, the variety of tastes and eating habits can be wide, creating a more holistic representation of the response to a new product like young jackfruit tacos. By involving consumer panellists from various groups, it is hoped that this survey will be able to produce more comprehensive and representative data regarding the acceptance of this product on the market. By combining the diversity of participants with a comprehensive understanding of consumer preferences in Lembang, it is hoped that this survey can provide a solid foundation for directing the development and marketing of this young jackfruit taco product, both locally and more broadly. Referring to Table 1, the majority of respondents were women (83.3%) aged 18 – 23 years (50%).

**Table 1:** Characteristics of Respondents

No	Item	Number of respondents	(%)
1	<i>Gender</i>		
	Male	5	16.7
	Female	25	83.3
2	<i>Age of respondents</i>		
	18 – 23 years	15	50
	24 – 29 years	9	30
	30 - 35 years	6	20

Source: Survey Analysis (2023)

When seeing the initial appearance of the product, consumer panellists expressed extraordinary enthusiasm. They were impressed by the visual similarity between the young jackfruit taco and the beef taco, creating a mouth-watering view. However, some panellists provided constructive suggestions for adding additional ingredients to improve the color combination of the product, providing a more attractive visual touch. When it came to aroma, consumer panellists agreed that the aroma of young jackfruit tacos was very attractive. They observed a significant similarity to the aroma of beef tacos, creating a sensory experience that was captivating and appetizing.

In terms of taste, consumer panellists responded with praise for the deliciousness of the product. They stated that these young jackfruit tacos not only succeeded in imitating, but also delivered delicious flavors. The taco's characteristic cumin aroma is recognized as an element that contributes positively to the overall taste experience. Not only in terms of taste, but also the texture of the product is also a positive point that is really liked by the consumer panellists. They highlight in particular the fibrous texture that young jackfruit has, providing an added dimension to the taco-eating experience. Overall, the positive response from consumer panellists provides strong support for the potential success and market acceptance for this young jackfruit taco product.

## DISCUSSION

In the hedonic test session conducted by consumer panellists, the taco product made from young jackfruit received a positive response which was quite encouraging. When they first saw the product, consumers showed high enthusiasm. They stated that the appearance of young jackfruit tacos is similar to beef tacos, inviting curiosity and the desire to try this product. However, several panellists suggested adding other additional ingredients to increase the colour combination of the young jackfruit tacos, providing a more attractive visual touch. Aroma is one aspect that consumers really like. They noted that the aroma of this product was similar to the aroma of beef tacos. This similarity in aroma is considered a positive value, ensuring that the consumer's sensory experience is maintained properly. The taste of the young jackfruit taco product received a positive assessment from most consumer panellists.

Panellists stated that this product had a delicious taste, with the cumin aroma that is characteristic of tacos, which was considered very good. However, as with every product trial, there were some suggestions made by consumers regarding taste. Some of them suggest adjusting the dosage of certain ingredients to improve the balance of taste. The texture of the product is also a point that consumers really like. They expressed their love for the texture of young jackfruit tacos, especially the fibrous texture of young jackfruit. The presence of a texture similar to beef is an added value, creating a satisfying eating experience for consumers. Combining attractive appearance, authentic aroma, delicious taste and satisfying texture, this product can be an attractive choice for consumers looking for variety in their diet. Suggestions provided by consumers can also be taken into consideration for further improvements, ensuring that this product can meet consumers' broad tastes and remain competitive in the ever-growing culinary market.

## CONCLUSION

After going through a series of experiments and research related to making young jackfruit tacos, as well as collecting assessment data from expert panelists and consumers, a number of important findings were identified. The process for making young jackfruit tacos is basically the same as making beef tacos in general. However, the main difference appears at the stage of stewing young jackfruit, which apparently requires a shorter time compared to the same process for beef. The process of stewing young jackfruit only takes 30 minutes, while expert panelists noted that stewing beef for tacos takes around 120-180 minutes. These findings indicate the potential of young jackfruit as a more efficient substitute material in the manufacturing process. The results of organoleptic or sensory tests showed that the appearance of young jackfruit tacos was considered good by the panelists, although the color combination was considered less attractive when compared to beef tacos which are generally topped with cheese. The aroma and taste of the product are considered to be excellent, with no noticeable taste or aroma disturbances. The biggest surprise came from the texture test, where young jackfruit tacos were judged to have a texture that was quite similar to beef, especially in terms of its fibrous properties. Many of the panelists were surprised by these similarities.

The results of the hedonic or liking test showed that the majority of expert panelists and consumers gave positive responses to young jackfruit tacos. They welcomed the presence of this alternative product by appreciating its good appearance, appetizing aroma, delicious taste and surprising texture. This positive response creates a great opportunity for young jackfruit tacos to be accepted in the consumer market, especially among those looking for innovative and more sustainable menu variations. Overall, these findings provide strong support for the potential use of young jackfruit as a beef substitute in tacos. Process efficiency, good sensory quality, and positive response from panelists provide a solid basis for further development and acceptance of this product in the culinary market.

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