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## Organoleptic product study of Gyoza products with natural dyes extracted from purple sweet potatoes

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**Abstract.** The use of purple sweet potato as a natural colour extract in food processing is one of the food industry's efforts to draw customer attention, and its use is deemed healthier for eating, as shown in processed food Gyoza. Wheat flour, cornstarch, tapioca flour, and purple sweet potatoes that have been boiled to retain the atocyanin chemicals and as natural colours are the main ingredients in manufacturing Gyoza skin (dumpling). Organoleptic tests on aroma, taste, texture, and color were employed as the research approach. The findings revealed that 22 respondents thought the Purple Gyoza product was satisfactory and quite appealing for customer consumption when considering the taste and correct processing procedure.

### 1. Introduction

In the current era of globalization, the phenomena of numerous popular cultures have evolved in the midst of society. And it is undeniable that Asian cultures are now in the spotlight as popular culture among the global community, including the culture of Japan, whose cultural trend is considered timeless due to its very unique culture, which is packaged in a variety of forms ranging from films, music, anime, manga/comics, fashion styles, and even culinary delights. Sushi, sukiyaki, tempura, and other traditional Japanese dishes have now gone international; in this case, they are well-known throughout the world. People all across the world are familiar with it, and they may readily enjoy it in any location [1].

Gyoza is one of Japan's most popular dumplings. Gyoza, despite its popularity in Japan, is originally a Chinese dish known as Jiaozi. Because the shape of the gyoza resembles a horn, the word jiao means "horn." Gyoza is made up of two parts: a wheat flour skin and a filling made up of chopped cabbage, onions, and pork. The gyoza skin is created by mixing flour with hot water and forming circular sheets, while the gyoza filling is made by stirring minced beef, chopped cabbage, scallions, and liquid seasoning until well combined [2]. Gyoza is a healthy food, as described by Permatasari in her writings, because it contains protein, vitamins, and minerals in the filling, as well as energy and carbohydrates in the skin [3].

In general, there are three types of Gyoza on the market: Yaki Gyoza, which is gyoza that is pan-fried (cooked by roasting with sesame oil), Sui Gyoza, which is gyoza that is prepared by boiling or steaming (steaming), and Age Gyoza, which is gyoza that is deep-fried to generate a crispy texture. Gyoza can be made more interesting by swapping or replacing the filling with locally sourced or rarely used items with great nutritional value.



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This time, the product that will be produced to promote customer appeal will be an improvement on the skin of Gyoza using local food resources, specifically purple sweet potato as a natural colour.



**Figure 1.** Gyoza Original.



**Figure 2.** Purple Gyoza innovation.

In general, the quality of food ingredients is determined by a number of factors, including taste, color, texture, and nutritional value. Other factors, such as microbiological properties, are also considered, but before other factors are considered, the color factor appears first and is sometimes very decisive [4,5]. The usage of purple sweet potato as a natural dye for Gyoza skin was chosen not just because of consumer desire, but also because of the purple sweet potato's health benefits and efficacy over synthetic dyes. Synthetic dyes in food are not healthy for consumers, according to Hanum's writings, because some of them contain heavy metals that are damaging to health. As a result, the hunt for alternative natural color sources must be intensified. Anthocyanins are natural colors with the potential to be extracted [6].

Anthocyanins are flavonoid bioactive components that can give flowers, leaves, tubers, fruits, and vegetables red, purple, or blue colors depending on the pH of the environment they are in. Because anthocyanins are soluble in air and safe to consume, they are commonly employed as natural food and beverage colorants. Anthocyanins provide a number of health benefits, including lowering the risk of colon and liver cancer, as well as acting as an anti-diabetic and antioxidant [7]. Purple sweet potatoes have a high anthocyanin concentration. Purple sweet potato, in fact, is one of the cheapest and most frequently available sources of anthocyanins in Indonesia, as it contains more anthocyanins than other sweet potato kinds, with 11.051 mg/100 gr [8].

The goal of generating this processed product is to serve as an innovation step in entrepreneurship, which is defined as an activity that attempts to explore product innovation while taking risks in order to earn money or generate profits [5]. Based on the preceding description, the author attempts to develop the idea of manufacturing a form of Sui Gyoza that uses boiling purple sweet potato to achieve a purple tint on the Gyoza skin. The research challenge was stated as follows: 1) find the correct process for creating Gyoza from purple sweet potato, and 2) determine the percentage of respondents who gave the product a positive rating for aroma, texture, flavor, and color.

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## 2. Research method

### 2.1. Research design

This study uses a descriptive qualitative research design with an organoleptic test on a Gyoza Ungu product made with purple sweet potato as the major ingredient. The production of these items went through numerous methods and trials until the Gyoza Ungu product produced the greatest results, which

was then carried out by 22 respondents. Respondents in organoleptic tests are concerned with assessing aroma, taste, texture, and color [9].

### 2.2. Procedure for making purple Gyoza (purple sweet potatoes)

Respondents were included in this investigation. Students that are enrolled in entrepreneurial classes are the respondents. The research approach for the production of Purple Gyoza (Purple Sweet Potato) is presented in the form of an entrepreneurial proposal, which includes an explanation of why Purple Gyoza was chosen as the product name and the main elements used in its production. Furthermore, the purple Gyoza product was organoleptically examined, namely the preference/acceptance test, and the results were discussed in a Focus Group Discussion (FGD). This preference/acceptance test entails a person's participation in evaluating a trait or quality of a component as the source of interest in a group product. The ability of the sense organs to give impressions or responses that can be examined or discriminated based on the type of impression is the focus of organoleptic testing. The ability to detect (detection), recognize, differentiate, scale, and express likes or dislikes on the product are among these characteristics.

#### 2.2.1. Ingredients purple Gyoza

##### **Gyoza Filling:**

1. Minced chicken
2. Cornstarch
3. Grated carrots
4. Chives that have been cut
5. Garlic
6. Celery leaves
7. Onion
8. Pepper powder
9. Salt
10. Flavoring

##### **Gyoza Skin:**

1. Tapioca flour
2. Cornstarch
3. Wheat flour
4. Purple sweet potato
5. Salt

##### **Tools used:**

1. Knife
2. Grate
3. Cutting Board
4. Bowl
5. Plate
6. Spoon
7. Mold
8. Pot / steamer
9. Rolling Pin

#### 2.2.2. Processing

Prepare all of the necessary materials and tools.

1. 2 purple sweet potatoes, peeled Then, after washing the peeled sweet potatoes, cut all of the purple sweet potatoes into 2-cm pieces.
2. Boil a kettle of water until it reaches a rolling boil. Then prepare a steaming area, as we'll be steaming the sweet potato that was chopped previously.

3. After the water has to a boil, place the purple sweet potato chopped into the steamer. The purple sweet potato should be cooked and tender after 10-15 minutes.
4. Prepare the ingredients for the gyoza filling while you wait for the purple sweet potato to cook.
5. Minced chicken and grated carrots are required for gyoza stuffing [10], chopped white mustard [11], chopped garlic, celery and scallions [12] it is then chopped into pieces and seasoned with salt and pepper
6. Prepare a bowl and a spoon, then add all of the previously prepared filling ingredients and combine everything together until it forms a dough, then add the cornstarch, ground pepper, salt, and flavorings.
7. Transfer the purple sweet potato to a separate bowl after it has been heated and softened. The purple sweet potato was then mashed with a spoon, fork, or your hands, and a pinch of salt was added [13] then stirred.
8. Prepare the gyoza skin components, which include cornstarch, tapioca flour, and wheat flour [14]. After all of the other ingredients have been made, combine all of the flour in a separate bowl and well combine.
9. After the flour mixture has been thoroughly combined, add the mashed purple sweet potato and stir again with a spoon or by hand. Once thoroughly combined, gradually add hot water to the dough while constantly stirring. Manufacture sure the flour dough is not too soft, but still thick, since if the water is too much, the flour dough will become mushy and will be difficult to form into the appropriate dough, making the gyoza skin difficult to make.
10. Prepare a cutting board and utensils to flatten the flour mixture once the gyoza skin dough is ready. Then take a little amount of dough and place it on a cutting board / table while flattening it with a flattener; after the dough is flat, take it and print it on top of the dough that has already been flattened; then lift and transfer the printed part to a plate that has been dusted with flour. Continue until the flour dough is depleted and there are a large number of gyoza skin molds.
11. After the gyoza skin is ready, place it in the palm of your hand, fill it with enough gyoza filling, blow a little air on the edge of the gyoza skin, and start gluing the edges of the gyoza skin until it covers the gyoza filling, slowly gluing - be careful not to tear the skin, try placing the gyoza on a plate after the gyoza dough is finished. Continue until you've used up all of the gyoza skin and filling.
12. Prepare water in the pot and steamer [15]. After that, bring the water to a boil. After boiling all of the gyoza we created earlier, brush it with a little butter to keep it from sticking to the steamer. After that, steam the gyoza for 10 minutes, or until they're done.
13. When the gyoza is done, remove it from the pan and set it on a platter. At this point, you can serve it with chili sauce.

### 3. Result and discussion

#### 3.1. Data analysis

22 respondents provided evaluation results and input, as well as presentation calculations. The results of the evaluation in the group experienced a change in the technique of cooking when practicing the first and second, which then gave the ultimate result by being steamed over hot water that was covered in a cooking pot. Furthermore, before the goods are marketed, there is an evaluation in class that is attended by lecturers and students in trials and evaluations. If customers in the class don't like the texture or flavor, they can give it a value of 1 if they don't like it. Consumers, on the other hand, can provide a value for the highest value if they enjoy it.

1 = Very disliked

2 = Enough

3 = Like

4 = Really like

Several assessment criteria are given for the evaluation of Gyoza meal, such as A = Aroma, T = Texture, T = Taste, C = Color, O = Overall, ATTCO, which we will organize in a table for the results of the evaluation in class. There are 22 persons in the class who will answer with a value.

**Table 1.** Panelists’ responses to the Purple Sweet Potato Gyoza Organic test in the form of scores .

Assessment	Aroma	Texture	Taste	Color	Overall
<b>1 = very disliked</b>	0	0	0	0	0
<b>2 = Enough</b>	2	2	0	0	0
<b>3 = Like</b>	11	8	14	5	9
<b>4 = Really Like</b>	9	12	8	17	13
<b>Total</b>	<b>22</b>	<b>22</b>	<b>22</b>	<b>22</b>	<b>22</b>

**Table 2.** Panelists for the Organic Purple Sweet Potato Gyoza test as a percentage.

Score	Aroma	Texture	Taste	Color	Overall
<b>1</b>	0	0	0	0	0
<b>2</b>	9.0%	9.0%	0	0	0
<b>3</b>	50%	36.3%	63.6%	22.7%	40.9%
<b>4</b>	40.9%	54.5%	36.3%	77.2%	59.0%
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

We may deduce from the data that 9.0 percent of respondents enjoy the scent of food, 50 percent enjoy the fragrance of food, and 40.9 percent enjoy the smell of the food served. The texture of the food is liked by 9.0 percent of respondents, 36.3 percent of respondents like the texture of the food, and 54.5 percent of respondents truly appreciate the texture of the food supplied. In terms of flavor, 63.6 percent of respondents enjoy the processed food offered, while 36.3 percent really like it. In terms of color, 22.7 percent of respondents like the color of food, while the remaining 77.2 percent truly like it. Overall, 40.9 percent of respondents enjoyed Purple Sweet Potato Gyoza's processed food product, and 59.0 percent of respondents really liked Purple Sweet Potato Gyoza's processed food product.

When the opportunity for respondents to provide criticism and suggestions for the products they tasted was opened, several people expressed their opinions about things that need to be improved before the goods are marketed, including a lack of taste in the preparation or not being salty, as well as the lecturer's opinion that there is too much oil, despite the fact that the purpose of the pres.



**Figure 3.** Purple Gyoza Production Process



**Figure 4.** Purple Gyoza Production Process



**Figure 5.** Production of packaged Purple Gyoza.

### 3.2. S.W.O.T.

From the definition, SWOT stands for (Strengths, Weaknesses, Opportunities, Threats). Which can be interpreted in Indonesian (strengths, weaknesses, opportunities, and threats) [16]. SWOT is an examination to find variables for making strategic decisions within the organization, according to Pamungkas, Endang Widuri Asih [17]. SWOT can be defined as a process for analyzing product capabilities and weaknesses in order to take strategic steps forward, according to the two definitions above. There are several types of analysis. According to Ahmad's research, a swot analysis is an important step for a food firm to do when determining the foundation for marketing planning and strategy [18]. This analysis is based on logic that can maximize strengths & opportunities, but minimize weaknesses and threats [19]. The author, according to our two quotes, does a swot analysis when taking action or strategizing.

- Strength: namely the elements used to make gyoza, are very easy to get or process from materials found around us. To start this business, we can do it ourselves.
- Weakness: the price of gyoza, if sold for 4 gyoza 10,000, could be too expensive or inefficient. Gyoza has a flaw in this regard.
- Opportunity: Continue to prioritize the peculiar flavor of the Indonesian tongue by manufacturing gyoza with skin or with purple sweet potato as the primary ingredient, which will be simpler for Indonesians to desire. Gyoza with purple skin is a novel innovation that will pique people's attention. Also, any daging filling can be used in place of the chicken flesh.
- Threat: Many restaurants now sell a range of fried dishes, causing many clients to switch to alternative items. There will be a lot of competition if it is made in a big city. There are several syomai, dimsum, and similar food enterprises in Makassar, for example. And the stuff we utilize is simple enough that it will be easy for others to copy.

### 4. Conclusion

Because purple sweet potatoes contain high levels of anthocyanins, maintaining the anthocyanin compounds in purple sweet potatoes is critical for overall health. Then purple sweet potatoes are steamed and blended with processed flour components to form Gyoza skin (dumpling) so that it is not only purple in the skin layer of Gyoza but also has anthocyanin content in processed Gyoza.

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