

CHAPTER IV

RESULT AND DISCUSSION

4.1 Product Result

Compared to regular gyoza, sorghum gyoza is a new addition. The main ingredients in sorghum gyoza is sorghum flour, which is used as the base for the gyoza skin and wheat gluten flour is used as a binding agent the gyoza skin dough. The content of sorghum flour is as follows with a protein content of 10.11%, fat 3.65%, coarse fiber 2.74%, minerals 2.24, starch 80.42%, carbohydrates 73% (Setyani, 2015). While the nutritional content of wheat gluten flour as follows, protein 11.6%, fat 2%, coarse fiber 1.6%, mineral (ash) 3.5%, starch 70%, carbohydrate 71% (Sa'diyah, 2022) (Kim & Kim, 2021). The reason this gyoza from sorghum flour was made is because it'll be an innovation that has never been done before, besides that, it helps reduces the use of wheat flour which is still imported from abroad. On the other hand sorghum is easy to grow in Indonesia, so it can be as used an alternative to wheat flour.

Gyoza skin is usually made from all purpose flour, tapioca flour, and water; however, the culinary innovation and new product development being developed uses sorghum flour, gluten flour, and milk to make gyoza skin. In order to compete with gyoza generally, it is believed that the formulation will result in healthier gyoza skins and a delectable taste. From the sensory results, 9 out of 10 panelists agreed with the results of sorghum gyoza. However, one panelist did not agree with the texture and taste, saying that the taste was not good and that the texture of the skin was still not fully cooked. Tastes that aren't as tasty can be made better by adding more spice or other flavors that people like. Whereas in terms of texture, the cooking techniques and methods can be optimized. As for the smell, there is nothing unpleasant about it, but the sorghum gyoza tend to be darker because the sorghum flour is slightly brown.

4.2 Nutrition Fact

4.2.1 Nutrition Table

The nutritional content of sorghum flour is as follows:

Table 4. 1 Nutrient content of sorghum Flour per 100 g

Nutrient content	Sorghum flour(g)
Protein	10,11
Fat	3,65
Coarse fiber	2,74
Mineral	2,24
Starch	80,42
Carbohydrate	73

(Setyanti, 2015).

Table 4. 2 Nutrient content of wheat gluten flour per 100 g

Nutrient content	Wheat gluten flour(g)
Protein	11,6
Fat	2
Coarse fiber	1,6
Mineral(ash)	3,5
Starch	70
Carbohydrate	71

(Sa'diyah, 2022), (Kim & Kim, 2021)

Table 4. 3 Nutrient content of full cream milk per 200 ml

Nutrient content	Full cream milk(ml)
Protein	10
Dietary fiber	4
Total fat	10
Cholesterol	6
Saturated fat	14
Total Carbohydrate	3

(Bastomi, 2022)

Table 4. 4 Nutrient content of prawn per 100 g

Nutrient content	Shrimp(g)
Protein	18,35
Carbohydrate	5,73
Fat	0,86

(Anonymus, 2021)

Table 4. 5 Nutrient content of carrot per 100 g

Nutrient content	Carrot(g)
Protein	0,93
Carbohydrate	9,58
Fat	0,24
Fiber	2,8

(FatSecret, 2023)

Table 4. 6 Nutrient content of scallion per 25 g

Nutrient content	Scallion(g)
Protein	0,5
Sugar	0,6
Dietary fiber	0,7

(Anonymous, 2023)

4.2.2 Nutrition Calculation

Table 4. 7 Nutrient content of ingredient used in the recipe for sorghum gyoza

Ingredients	Calorie s(kkal)	Carbohy drate(g)	Protein (g)	Fat(g)	Sugar (g)	Fiber (g)	Sodiu m(mg/ 100gr)
Sorghum flour(60g)	221	47,6	18,7	0,85		4	
Wheat gluten flour(30g)	111	4,14	22,55	0,56		2	
Full cream milk(52,5ml)	32	2,36	1,58	1,58			
Sugar(3g)	12				3		
Salt(5g)							
White pepper(5g)	15	3,43	0,52	0,11			5
Mushroom stock powder(5g)							
Vegetable oil(15ml)	133			15			
Sesame oil(10ml)	88			10			
Soy sauce(15ml)	8	1,14	0,94	0,01			
Prawns(200g)	208,12	45,84	146,8	15,48			
Chicken powder(5g)							
Cornstarch(35g)	133	31,94	0,09	0,02			
Carrot(50g)	20	4,79	0,46	0,12			
Scallion(15g)	4,32	1,1	0,27	0,03	1,44	1,68	
Water(200ml)							
Garlic(20g)	30	6,61	1,27	0,1			
Total	1.015,44	148,9	193,2	43,86	4,44	7,68	5

4.2.3 Nutrition Label

Nutrition Facts	
2 servings per container	
Serving size	5 unit (100g)
Amount Per Serving	
Calories	510
% Daily Value*	
Total Fat 44g	56%
Saturated Fat 0g	0%
Trans Fat 0g	
Sodium 5mg	0%
Total Carbohydrate 149g	54%
Dietary Fiber 8g	29%
Total Sugars 4g	
Includes 0g Added Sugars	0%
Protein 193g	386%
<small>Not a significant source of cholesterol, vitamin D, calcium, iron, and potassium</small>	
<small>*The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.</small>	

Figure 4. 1 Nutrition fact of sorghum gyoza

4.3 Food Safety and Packaging

4.3.1 Processing and Storage Temperature

Gyoza is produced by wrapping the ingredients in a thin, spherical dough skin. The thin skin is created with a noodle or pasta rolling machine, depending on personal preference. By pressing the edges together in crescent or angular forms, the filling is sealed inside the covering. Gyoza wrappers can be produced from dough made from wheat flour, rice, or starch. Typically, the fillings consist of ground meats or shellfish blended with sliced veggies. Products made from rice or starch are typically included in the dim sum category. Boiling, steaming, and frying are all types of cooking (Jing et al., 2020).

This is due to the new trend in the pattern of consumption in a society that is slowly shifting to foods that are easy to prepare and can be stored for an extended period of time. Some of these foods include gyoza, nuggets, and processed meat in frozen form (Indria et al., 2023).

There are four methods to store food based on temperature in order to minimize deterioration and material loss: Storage cool (cooling), specifically storage between 10°C and 15°C for beverages, fruits, ice cream, and vegetables. Cold storage (chilling), specifically storage at 4°C-10°C for protein-containing foods that will be processed again shortly.

Frozen storage (freezing), storage temperature of 0°C to 4°C for protein materials that are readily broken for up to 24 hours. Storage frozen, storage at temperatures below 0°C, is required for protein goods that are perishable for more than 24 hours (Ramahdani & Sumarmi, 2017).

Because sorghum gyoza contains a protein filling that is readily degraded at temperatures above 0°C, the product should be frozen and stored at a temperature below 0°C. This will also extend the shelf life of the product.

4.3.2 Shelf Life

Several factors must be considered when implementing food sanitation and hygiene practices. There are four aspects to the implementation of food hygiene, beginning with the selection of food basic materials and ending with the serving of prepared foods. Regarding the choice of Food Raw Materials When Obtaining Food Products, quality

Good ingredients for food can be identified by their appearance and quality. Good quality food ingredients, namely food ingredients that are free of pollution and chemical contamination such as pesticides. The second is food storage, which is a method for preventing the deterioration and loss of nutritional value of food ingredients. The third is Food Processing, which is the transformation of uncooked ingredients into consumable foods. To produce quality food, processing must adhere to food hygiene and sanitation principles. The hygiene of food handlers, food processing methods, and the processing site must be considered when preparing food for consumption. The fourth is the storage of prepared food, which requires the use of a sanitary container. The food and drink cover must be thoroughly clean and must not contaminate food. Additionally, cooked food needs to be stored individually based on kind (Ramahdani & Sumarmi, 2017). A trial was made within a week to determine the durability of the sorghum gyoza skin, which was stored in the freezer. After a week, it was determined that the gyoza skin was still in excellent condition in terms of texture, aroma, and flavor. If we apply

the four sanitation features listed above, sorghum gyoza may be able to keep for months when vacuum-packed and stored at 0 degrees Celsius.

4.3.3 Product Packaging

Packaging is derived from the word pack, which means clean, tidy, and complete. Packaging can also be defined as the consequence of packaging or protecting merchandise. packaging can be interpreted as an auxiliary term for objects wrapped in paper (leaves, plastic, etc.), but it can also refer to the materials used for packaging. Consequently, in this paper, packaging refers to the wrapping of food with leaves, paper, or plastic (Wahmuda & Moch, 2018). The three components of packaging are visual, verbal, and feature attributes. Visual attributes consist of graphics, colors, images, materials, shapes, and logos/symbols, despite the fact that some logos/symbols combine visual and verbal attributes. Verbal attributes consist of a series of letters or numbers, such as a brand, product name, manufacturer, nutrition information, usage instructions, and various other details. While features such as ergonomics, environmental friendliness, simplicity, and innovation contribute to the value of a product's comfort, they do not necessarily increase its worth. Since packaging is a compilation of attributes, it is essential to understand the attributes that influence purchasing decisions before developing additional packaging innovations (Hanifawat et al., 2017).

Sorghum gyoza are packaged in vacuum plastic. By removing oxygen from the package, vacuum packaging—where the pressure is less than 1 atm—extends the shelf life of the product. Regarding the benefits of vacuum packaging, which include extending shelf life, decreasing product loss, and preserving flavor. The product is placed into plastic packaging, air is controlled with a vacuum packaging machine (Vacuum Packager), and the package is then closed and sealed. According to Colby et al. (1993), vacuum packaging is used to reduce or completely eliminate the limited oxygen content of an environment. When there is no air present throughout the storage procedure, oxidation's negative effects can be eliminated, preserving freshness.

When compared to products that are not vacuum-sealed, the product will last 3-5 times longer (La et al., 2018). A form of plastic called plastic vacuum is created from nylon and PE. When the air in the container has been vacuumed out, the nylon barrier prevents air from entering once more. Materials made of nylon and PE will be vacuum-packed into plastic. The packaging process needs a tool in the form of a vacuum sealer machine in order to produce vacuum packaging that is vacuum.

Utilizing this instrument has the goal of vacuuming or emptying the package's air in order to extend the shelf life of food and beverages (Pertiwi, 2020). Sorghum gyoza's packaging is embossed nylon plastic.

Nylon vacuum plastic comes in two varieties: plain and embossed. The difference between the two is that plain vacuum plastic has both transparent and smooth sides. Even though the hue is typically more opaque, the product's ingredients are still easily discernible. Vacuum embossed plastic, on the other hand, has a roughness or a few spots that, when touched, feel a bit scratchy. Typically, the embossed texture is situated halfway between the plastic's two sides. But there are also mixed designs, where the front is embossed or textured and the back or the opposite side is plain or has no texture. It is far more beautiful than plain vacuum plastic when compared to the appearance of embossed vacuum plastic (Wardy, 2022). The embossed plastic sorghum gyoza size 16 x 24 cm.

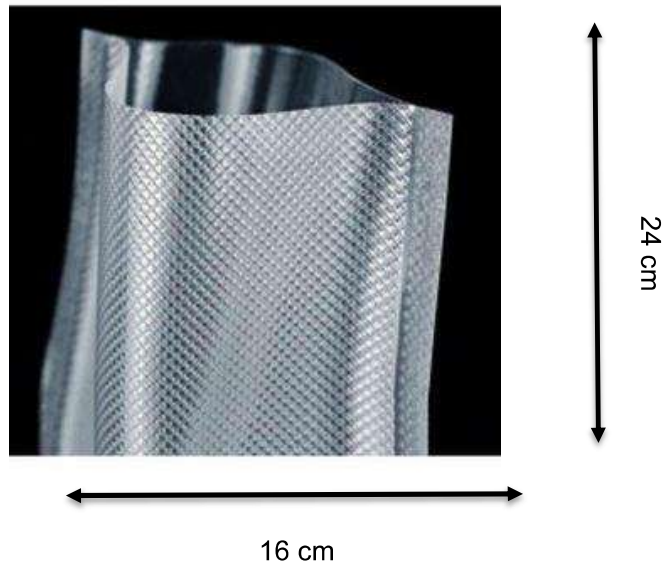


Figure 4. 2 Emboss vacuum plastic

The packaging label and logo for sorghum gyoza such as the name of the product, the quantity of entries, the net weight, the composition, the expiration date, the nutrition information table, keeping instructions, and a list of names and contacts

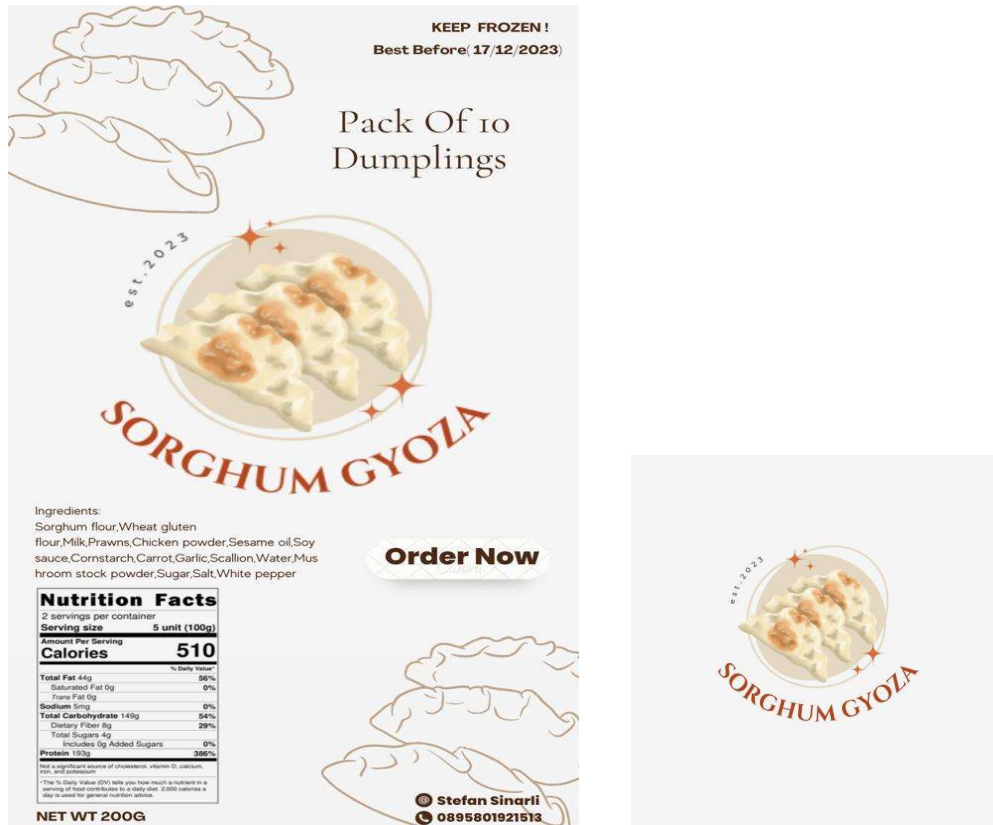


Figure 4. 3 Label and Logo

4.4 Financial Aspects

4.4.1 Product Cost (Variable cost, Overhead cost, Fixed cost)

Product cost is calculated based on the total of all cost per month. The costs consist of labour cost, raw material cost, packaging cost, and utility cost. The labour cost is considered based on monthly working days, which are 25 days per month. In a day, 100 pieces, 10 recipe of stuffing are produced, and in a month, 2,500 pieces or 250 recipes. For

the skin, 100 pieces are produced per day and 2.500 pieces or 125 recipes per month.

1. Start-up Capital

Table 4. 8 Start-up capital

Tools and Equipment	Quantity	Price(/Unit)	Sub Total
Knife	2	Rp. 50.000	Rp. 100.000
Cutting board	2	Rp. 50.000	Rp. 100.000
Digital scale	2	Rp. 40.000	Rp. 80.000
Small bowl	3	Rp. 20.000	Rp. 60.000
Large bowl	2	Rp. 50.000	Rp. 100.000
Spoon	12	Rp. 1.000	Rp. 12.000
Grinding machine	1	Rp. 1.400.000	Rp. 1.400.000
Blender	1	Rp. 150.000	Rp. 150.000
Large non-stick frying and lid	2	Rp. 1.050.000	Rp. 2.100.000
Wooden spatula	2	Rp. 4.500	Rp. 9.000
Peeler	1	Rp. 7.000	Rp. 7.000
Chest freezer	1	Rp. 2.500.000	Rp. 2.500.000
Ring cutter	3	Rp. 7.000	Rp. 21.000
TOTAL			Rp 6.639.000

2. Labour Cost

Table 4. 9 Labour Cost

Occupation	Personel	Salary(/Month)	Sub Total
Owner	1	Rp. 5.000.000	Rp. 5.000.000
Cleaning service officer	1	Rp. 1.500.000	Rp. 1.500.000
TOTAL			Rp. 6.500.000

3. Packaging Cost

Table 4. 10 Packaging Cost

Packaging	Quantity	Price(/unit)	Sub Total
Emboss Plastic	10pcs	Rp. 1.000(/pcs)	Rp. 10.000
Plastic bag	10pcs	Rp. 500(/pcs)	Rp. 5.000
TOTAL(/Day)			Rp. 15.000
TOTAL (/Month)			Rp. 375.000

4. Utility Cost

Table 4. 11 Utility Cost

Facility	Quantity	Price(/unit)	Sub Total
Water	150 L		Rp. 150.000
Electricity	1.000 kWh		Rp. 1.000.000
Gas	12 Kg		Rp. 96.000
TOTAL (/Day)			Rp. 49.840
TOTAL (/Month)			Rp. 1.246.000

5. Raw Material Cost

Table 4. 12 Raw Material Cost

Raw Materials	Quantity	Price(/unit)(Rp)	Sub Total(Rp)
Sorghum flour	120 g × 5	Rp. 7.500(100g)	Rp. 45.000
Wheat gluten flour	60 g × 5	Rp. 30.000(500g)	Rp. 18.000
Full cream milk	105 ml × 5	Rp. 6.000(250ml)	Rp. 12.600
Sugar	3 g × 10	Rp. 14.000(1.000g)	Rp. 420
Salt	5 g × 10	Rp. 2.500(250g)	Rp. 500
White pepper	3 g × 10	Rp. 14.000(100g)	Rp. 4.200
Mushroom stock powder	5 g × 10	Rp. 6.000(40g)	Rp. 7.500
Vegetable oil	15 ml × 10	Rp. 5.000(220ml)	Rp. 3.410
Sesame oil	10 ml × 10	Rp. 13.500(110ml)	Rp. 12.270
Soy sauce	15 ml × 10	Rp. 6.000(135ml)	Rp. 6.670
Prawns	200 g × 10	Rp. 55.000(1.000g)	Rp. 110.000
Chicken powder	5 g × 10	Rp. 1.000(9g)	Rp. 5.560
Cornstarch	35 g × 10	Rp. 7.000(100g)	Rp. 24.500
Carrot	50 g × 10	Rp. 10.000(1.000g)	Rp. 5.000
Scallion	15 g × 10	Rp. 3.000(100g)	Rp. 4.500
Water	200 ml × 10	Rp. 4.000(19l)	Rp. 420
Garlic	20 g × 10	Rp. 3.000(100g)	Rp. 6.000
TOTAL(/day)			Rp. 266.550
TOTAL(/month)			Rp. 6.662.500

6. Rent Cost

Table 4. 13 Maintenance Cost

Facility	Size	Price	Sub Total(Rp)
Maintenance cost		Rp. 500.000(/month)	Rp. 500.000
TOTAL(/month)			Rp. 500.000

7. Total Cost

Fixed Cost = Labour Cost and Rent Cost

Variable Cost = Raw Material Cost, Packaging Cost, and Utility Cost

$$\begin{aligned}
 \text{Total Cost(/Month)} &= \text{Labour} + \text{Material} + \text{Packaging} + \text{Utility} + \text{Rent Cost} \\
 &= \text{Rp. } 6.500.000 + \text{Rp. } 6.662.500 + \text{Rp. } 375.000 + \text{Rp. } 1.246.000 + \text{Rp. } 500.000 \\
 &= \text{Rp. } 15.283.500
 \end{aligned}$$

4.4.2 Selling Price

$$\begin{aligned}
 \text{Product Price} &= \frac{\text{Total cost(/month)}}{\text{Total product units(/month)}} \\
 &= \frac{\text{Rp. } 15.283.500}{250 \text{ pack}} \\
 &= \text{Rp. } 61.134 / \text{Pack}
 \end{aligned}$$

$$\begin{aligned}
 \text{Product selling price} &= \text{Product Price} + \left(\frac{\text{Product Price} \times \text{Profit Percentage}}{\text{Profit Percentage}} \right) \\
 &= \text{Rp. } 61.134 + (\text{Rp. } 61.134 \times 40\%) \\
 &= \text{Rp. } 61.134 + \text{Rp. } 24.453,6 \\
 &= \text{Rp. } 85.587,6 \approx \text{Rp. } 86.000
 \end{aligned}$$