CHAPTER IV

RESULT AND DISCUSSION

4.1 Product Result

Based on the sensory evaluation, the purple sweet potato and miana noodle has a good smell and taste. However, the sight and the texture was not good enough. Some of the panelists mentioned the texture of the noodle was unlike the usual noodle. The noodle was too brittle causing short noodle strands. This is caused by the lack of gluten in this gluten free noodle. According to Milde et al. (2020), although pasta is widely consumed and simple to make, the absence of gluten makes the dough fragile, crumbly, and difficult to process.

4.2 Nutrition Fact

4.2.1 Nutrition Table

The nutritional value of purple sweet potato is as follows

Table 4.1 Nutritional Value of Purple Sweet Potato per 100g

Calorie (cal)	101
Protein (g)	1.54
Fat (g)	0
Carbohydrate (g)	20
Fiber (g)	3.1
Sugar (g)	3.85
Calcium (mg)	30
Iron (mg)	0.62
Potassium (mg)	337
Sodium (mg)	54

Source: USDA FoodData Central, 2020

Table 4.2 Nutritional Value of Miana Leaves per 100g

Calorie (cal)	96
Protein	20.33
Fat	1.7
Fiber	35.66
Ca	3.29

Source: Fati et al., 2020

Table 4.3 Nutritional Content of Tapioca Starch per 100g

Calorie (cal)	350
Protein (g)	0
Fat (g)	0
Carbohydrate (g)	90
Calcium	20

Source: USDA FoodData Central, 2020

4.2.2 Nutrition Calculation

Table 4.4 Nutritional Value of Ingredients used in The Recipe for Purple Sweet Potato and Miana Noodle

Ingredients	Calories (cal)	Carbohydrate (g)	Protein (g)	Fat (g)	Fiber (g)	Sugar (g)	Ca (mg)	Fe (mg)	K (mg)	Na (mg)
Purple sweet potato (85g)	85.85	17	1.31		2.635	3.273	25.5	0.527	286.45	45.9
Tapioca starch (55g)	192.5	49.5					11			
Miana leaves (100g)	96		20.33	1.7	35.66		3.29			
Salt (1g)							0.24		0.08	388
Water (35ml)										
Xanthan Gum (1g)	3.5	1			1				6.5	31
TOTAL	**377.85**	**70.5**	**21.64**	**1.7**	**39.295**	**3.273**	**40.03**	**0.527**	**293.03**	**464.9**

4.2.3 Nutrition Label

Nutrition Facts

2 servings per container

Serving size	(75g)

Amount Per Serving

Calories 190

	% Daily Value*
Total Fat 1g	1%
Saturated Fat 0g	0%
Trans Fat 0g	
Sodium 230mg	10%
Total Carbohydrate 35g	13%
Dietary Fiber 20g	71%
Total Sugars 2g	
Includes 0g Added Sugars	0%
Protein 11g	22%

Not a significant source of cholesterol, vitamin D, calcium, iron, and potassium

*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.

4.3 Food Safety and Packaging

4.3.1 Processing and Storage Temperature

The process of making purple sweet potato is divided into two parts, making the miana leaves powder and making the purple sweet potato and miana noodle. Purple sweet potato and miana leaves noodle has two heating processes which are drying and steaming. First, to make the miana leaves powder, the miana leaves are dried with a dehydrator at 40°C for 36 hours. Low temperature is used to minimize the degradation of the nutrients, as temperature has significant effect on the stability of some of the nutrients, one of them is anthocyanin, the pigment that can be found in miana leaves that has antioxidant activity. Previous study mentioned that anthocyanin stable at 50°C and will start to degrade at 75°C (Laksmiani et al., 2020), but another study is also mentioned that anthocyanin that is found in purple maize is stable even until 120°C (Slavu et al., 2020). Next heating process is steaming the purple sweet potato. Even though steaming uses a high temperature, several studies

have been said that steaming is one of the cooking methods that can preserve the anthocyanin content in vegetables. After the noodle is rolled and shaped, it needs to be dried one last time before it is ready to be packed. Purple sweet potato and miana noodles are dried at 40C for 24 hours. The recommended storage periods for dried foods range from 4 months to 1 year. Dried foods should be kept in cool, dry, dark areas (National Center for Home Food Preservation, n.d.).

4.3.2 Shelf Life

The shelf life of dry noodles varies depending on the type of noodle, storage, and moisture content. Due to the lower moisture content compared to wet noodles, dry noodles have a shelf life of 6 to 12 months with proper storage (Aminullah et al, 2020). Previous study has shown that gluten free noodle that made from composite flour (mocaf, tapioca, cornstarch, and soybeans) can stand around 161 days when stored at $25^{o}C$ (Violalita et al., 2021).

4.3.3 Product Packaging

Food packaging is very important. By forming a barrier of protection around the food, food packaging is essential for food preservation (Khalid & Arif, 2020). Food packaging not only helps in protecting the product's packaging life against any biological, chemical, environmental, or physical damages during transport and storage, but also helps to preserve quality and maintain safety (Khalid & Arif, 2020). The purple sweet potato and miana leaves noodles use two tipe of food packaging. The first one is aluminum foil bag (see Figure 4.1) for first protection. Foil bag is used to preserve the anthocyanin in the noodles, because anthocyanin stability is also caused by light (Enaru et al., 2021).

Figure 4.1 Aluminium Foil Bag

For the outer layer of the packaging, box made from paperboard (see Figure 4.2) is used. Due to its eco-friendly reputation, paper and paperboard-based material is one of the oldest and most widely used packaging forms for food products like milk and milk-based products, beverages, dry powders, confectionary, bakery products, etc (Deshwal et al., 2019). This statement is supported by another journal that mentioned Due to its sustainability, biodegradability, and recyclability, cellulose-based packaging has become increasingly popular (De Araújo Dos Santos et al., 2022; Abidi et al., 2022). Paper-based packaging solutions are in high demand as an alternative to currently used single-use petroleum-based polymers for food packaging applications because they offer direct recycling options and, in the event of accidental leakage, prevent the formation of microplastics through natural biodegradation (Adibi et al., 2022).

Figure 4.2 Paperboard Box

Figure 4.3 Logo

4.4 Financial Aspects

4.4.1 Product 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. As for raw material, the quantity of raw materials is counted as 20 recipes per day or 500 recipes per month, which are 40 portions per day or 1000 portions per month.

1. Start-Up Capital

Table 4.5 Start-Up Capital

Tools and Equipment	Quantity	Price / unit	Sub Total
Dehydrator	1	Rp360,000	Rp360,000
Mesh 80	1	Rp175,000	Rp175,000
Grinder	1	Rp56,000	Rp350,000
Pasta machine	1	Rp130,000	Rp130,000
Mixing Bowl	5	Rp50,000	Rp250,000
Steamer	1	Rp50,000	Rp50,000
Spoon	10	Rp2,000	Rp20,000
Fork	10	Rp2,000	Rp20,000
Peeler	1	Rp13,000	Rp13,000
Sauce pan	1	Rp150,000	Rp150,000
Digital scale	1	Rp45,000	Rp100,000
Measuring cup	1	Rp20,000	Rp20,000
TOTAL			**Rp1,668,000**

2. Packaging Cost

Table 4.6 Packaging Cost

Packaging	Quantity	Price/unit	Sub Total
Aluminium Bag	20	Rp1,200	Rp24,000
Paperboard Box	10	Rp3,000	Rp30,000
TOTAL (/day)			**Rp54,000**
TOTAL (/month)			**Rp1,350,000**

3. Raw Material Cost

Table 4.7 Raw Material Cost

Raw Materials	Quantity	Price/unit	Sub Total
Purple sweet potato	1.7 kg	Rp10,000/kg	Rp17,000
Tapioca starch	1.1 kg	Rp7,000/500g	Rp15,400
Miana leaves	2 kg	Rp30,000/500g	Rp120,000
Xanthan gum	20 g	Rp18,000/100g	Rp3,600
Water	600 mL	Rp20,000/19L	Rp632
Salt	20 g	Rp5,000/500g	Rp200
TOTAL (/day)			**Rp156,832**
TOTAL (/month)			**Rp3,920,800**

4. Total Cost

Variable cost: Raw material cost, packaging cost

Total cost (/month)   = Raw material + packaging

= RpRp3,920,800 + Rp1,350,000

= Rp5,270,800

4.4.2 Selling Price

Product Price   =   Total cost (/month) / Total product units (/month)

=   Rp5,270,800 / 500 pack

=   Rp10,541

Selling Price   =   Product price + (Product price x Profit percentage)

=   Rp10,541 + (Rp10,541 x 40%)

=   Rp14,757

≈   Rp15,000