

## CHAPTER IV

### RESULT AND DISCUSSION

#### 4.1 Product Result

The nutritional value of brownies is depending on the ingredients. The gluten free brownies are made by replacing wheat flour with substitution of modified cassava flour and pumpkin flour. Modified Cassava Flour is a cassava flour that is modified through fermentation process that involve bacteria and fungi. Mocaf can be a replacement for wheat flour because it is high in carbohydrate, rich in fiber, and iron (Ihromi *et al*, 2018). Mocaf is also used to reduce the strong pumpkin smell and taste, enhance the product texture. The pumpkin flour itself is increasing the nutritional value in the product because it is contains vitamin C, vitamin K, vitamin B3, iron, fiber, protein, and also rich in provitamin-A which is good for eyes, growth, and maintenance for body tissue. (Halimah & Rahmawati, 2021).

By combining the two flour ingredients will produce a good quality brownies, gluten free, and can be consumed with people who have coeliac disease and allergic in gluten. The pumpkin brownie product has a characteristic of brown color, has a dense texture, and smell a bit like pumpkin.

## 4.2 Nutrition Fact

### 4.2.1 Nutrition Table

**Table 4. 1** Nutritional Value of Pumpkin Flour per 100 g

Calorie (cal)	340
Protein (g)	10
Fat (g)	0,8
Carbohydrate (g)	78
Fiber (g)	23
Sugar (g)	18

Source: (Megum, 2022); (Dharmapadni *et al*, 2016)

**Table 4. 2** Nutritional Value of Mocaf Flour per 100g

Calorie (cal)	360
Sodium (mg)	35
Carbohydrate (g)	86
Dietary fiber (g)	8
Protein (mg)	2
Potassium (mg)	190

Source: Mocaf Ladang Lima

#### 4.2.2 Nutrition Calculation

**Table 4. 3** Nutritional Value of ingredients used in the recipe for Gluten Free Brownies

<b>Ingredient</b>	<b>Calories (cal)</b>	<b>Carbohydrate (g)</b>	<b>Protein (g)</b>	<b>Fat (g)</b>	<b>Sugar (g)</b>	<b>Fiber (g)</b>	<b>Sodium (mg)</b>
DCC (95 g)	570	47.5	4.75	38	38	9.5	47.5
Unsalted butter (80 g)	586.5			63.9			
Eggs (150 g)	220.5	1.1	18.8	14.9	1.1		210
Caster sugar (90 g)	348.6	90			90		
Cocoa powder (25 g)	100	13.3	5.8	2.5		10.8	8.3
Milk (75 g)	45	3.66	2.4	2.4	3	0.60	16.5
Choco chips (25 g)	124.6	16.6		6.9	11	2.7	
Pumpkin flour (100 g)	340	78	10	0.8	18	23	
Mocaf flour (25 g)	90	21.5	0.5			2	8.75
Vanilla extract (4 ml)	12	0.53			0.53		
Salt (2 g)							930
<b>TOTAL</b>	<b>2.437,02</b>	<b>272</b>	<b>42</b>	<b>129.21</b>	<b>162.42</b>	<b>49.3</b>	<b>1.221,3</b>

### 4.2.3 Nutrition Label

<b>Nutrition Facts</b>	
1 servings per container	
<b>Serving size</b>	<b>(220g)</b>
<b>Amount Per Serving</b>	
<b>Calories</b>	<b>810</b>
<small>% Daily Value*</small>	
<b>Total Fat</b> 43g	<b>55%</b>
Saturated Fat 28g	<b>140%</b>
<i>Trans</i> Fat 0g	
<b>Cholesterol</b> 265mg	<b>88%</b>
<b>Sodium</b> 410mg	<b>18%</b>
<b>Total Carbohydrate</b> 91g	<b>33%</b>
Dietary Fiber 0g	<b>0%</b>
Total Sugars 54g	
Includes 0g Added Sugars	<b>0%</b>
<b>Protein</b> 14g	<b>28%</b>
<small>Not a significant source of 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 Gluten Free Brownies

## 4.3 Food Safety and Packaging

### 4.2.1 Processing and Storage Temperature

Brownies production consist of a several operation units that are sorted in specific order. Those operation units weighing ingredients, mixing, baking, cooling, and packaging. Each operation units have individual intentions and step. Not only the processing units, but also the ratio and quality of the ingredients will determine the product end quality and nutritional value.

Weighing and dosing dry and wet ingredients is the first step in making brownies, weighing function to determine the number of sizes needed. The amount of each ingredients affects the final product from taste, smell, and texture. Mixing the wet ingredients by combining the eggs and sugar first with a mixer, this way can help the sugar dissolve faster. Then the dry ingredients are sifted

little by little to the wet ingredients, this way to prevent lumps in the batter and makes it distributed evenly. The batter then deposited in a baking pan to be baked with the time and temperature that has been set. The ingredients and baking time in the baking process affect the texture of the brownie, the longer the baking process will result a cakey, moist, and tender crumb while the shorter the baking process will result a more gooey, fudgy, and chewy texture. (McDowell, 2015). Baked brownie needs to cool down in a room temperature to let it be firm and makes it easier to cut then packaged.

#### **4.2.2 Shelf life**

Research done by Chusna & Zulfia (2016) about brownies shelf life testing, that from the observation for 7 days, resulted the shelf life for brownies in room temperature (20-22°C) is 3 days which are characterized by mold growth on brownies followed by other physical changes such as changes in taste on day six, changes in aroma on day four, and texture change on day five.

The longer the storage, the more mold is growing. The increase in fungi occurred due to the presence of mesophilic microbes that grew during storage. Mesophilic microbes have the ability to grow at temperature 15-30°C. So, it is safer to not consume brownies after 3 days, even though the taste has not changed. Storing brownies does not required to be refrigerated, unless the brownies include more perishable ingredients like fresh fruits or cream cheese frosting, but it can hold the shelf life longer to 10 days because the bacteria and microbes cannot grow due to the low temperature. Indicator of spoiled brownies can be seen from the appearance when it turns dry or if it is stored in the fridge there are white splotches or

so-called ice crystals is the indicator of freezer burn, smells bland and unpleasant.

### **4.2.3 Product Packaging**

Food packaging is an integral component of food industry and helps to store food and beverages in hygienic manner and preserve the food from possible hazards; such as a physical, chemical, or even microbiological; that can impact on quality and safety of the food itself. Selecting food packaging material has to consider cost, quality of product, and its ability to protect the food (Gupta & Dudeja, 2017).

Brownies is a ready to eat snack, where it usually packaged in a box, it is need to be stored in an enclosed container. Paper bowl is selected to be the packaging for brownies because it fulfills the requirements to storage brownies which is an enclosed container to keep it from going stale and keep possible contaminations out (Scott, 2022), and also the business idea is selling brownies in small pieces and will be called brownie bites, this is convenient for people who want to eat brownies in smaller size without need to cut it first. Paper bowl is a disposable cup made out of paper mills that is re-pulped. Disposable paper bowl is easily decomposed by microorganisms. Hence, they create lesser pollution issues and can be buried as compost or can be easily burned causing less pollution compared to disposable plastic bowl. It is a sustainable choice, eco-friendly, safe, lightweight, and biodegradable because paper is made out of trees and thus it is usually does not contain any toxic matter (Mel, 2020). The final packaging will be decorated with ribbon and packaging sticker to make it look more appealing.



Figure 4. 2 Paper bowl 16oz



Ingredients :

Pumpkin flour, Eggs, Dark Chocolate, Sugar, Butter, Milk, Mocaf flour, Choco Chips, Cocoa Powder, Vanilla Extract, Salt

Thankyou for your purchase!

☎ 0822 xxxx xxxx

📷 brownbites.id

*Brown Bites*  
Gluten Free Brownie

Nutrition Facts	
1 servings per container	
Serving size (220g)	
Amount Per Serving	
<b>Calories 810</b>	
<small>% Daily Value*</small>	
Total Fat 43g	55%
Saturated Fat 28g	140%
Trans Fat 0g	
Cholesterol 265mg	88%
Sodium 410mg	18%
Total Carbohydrate 91g	33%
Dietary Fiber 0g	0%
Total Sugars 54g	
Includes 0g Added Sugars	0%
<b>Protein 14g</b>	<b>28%</b>

\*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.

Netto: 220 g

Figure 4. 3 Logo

## 4.4 Financial Aspect

### 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 cost consists of labor cost, raw material cost, packaging cost, and utility cost. The labor cost is considered based on monthly working days, which are 25 days per month. As for raw material, 1 recipe produce 3 portions, the quantity of raw materials per day is 10 recipe, or 250 recipe per month, which are 30 portions per day, or 750 portion per month.

#### 1. Start-Up Capital

**Table 4. 4** Start-Up Capital

Tools and Equipment	Quantity	Price (/unit)	Sub Total
Knife	2	Rp. 25,000	Rp. 50,000
Cutting board	2	Rp. 20,000	Rp. 40,000
Peeler	2	Rp. 5,000	Rp. 10,000
Tray	4	Rp. 7,000	Rp. 28,000
Small mixing bowl	3	Rp. 4,000	Rp. 12,000
Large mixing bowl	1	Rp. 7,000	Rp. 7,000
Sauce pan	1	Rp. 125,000	Rp. 125,000
Sieve	1	Rp. 8,000	Rp. 8,000
Spoon	2	Rp. 2,000	Rp. 4,000
Silicone spatula	2	Rp. 10,000	Rp. 20,000
Digital scale	1	Rp 40,000	Rp. 40,000
Mixer	1	Rp. 150,000	Rp.150,000
Baking pan	2	Rp 18,000	Rp. 36,000
Baking paper	1 roll	Rp. 16,000	Rp. 16,000
Electric Oven	1	Rp. 750,000	Rp. 750,000
<b>TOTAL</b>			<b>Rp. 1,296,000</b>



## 2. Labor Cost

**Table 4. 5** Labor Cost

Occupation	Personnel	Salary (/month)	Sub Total
Assistant helper	1	Rp. 2,000,000	Rp. 2,000,000
Staff	1	Rp. 2,000,000	Rp. 2,000,000
<b>TOTAL</b>			<b>Rp. 4,000,000</b>

## 3. Packaging Cost

**Table 4. 6** Packaging Cost

Packaging	Quantity	Price (/unit)	Sub Total
Paper bowl	30	Rp. 2,000	Rp. 60,000
Ribbon	0.9m	Rp. 7,000 (/27m)	Rp. 2,300
Sticker	1 sheet	Rp. 2,000	Rp. 2,000
Paper bag	30	Rp. 400	Rp. 12,000
<b>TOTAL (/day)</b>			<b>Rp. 76,300</b>
<b>TOTAL (/month)</b>			<b>Rp. 1,907,500</b>

## 4. Utility Cost

**Table 4. 7** Utility Cost

Facility	Quantity	Price (/unit)	Sub Total
Water	100 L	Rp. 2,000 (/m3)	Rp. 200
Electricity	8 kWh	Rp. 1,500 (/kWh)	Rp. 12,000
<b>TOTAL (/day)</b>			<b>Rp. 12,200</b>
<b>TOTAL (/month)</b>			<b>Rp. 305,000</b>

## 5. Raw Material Cost

**Table 4. 8** Raw Material Cost

Raw Materials	Quantity	Price (/unit)	Sub Total
Dark cooking chocolate	950 g	Rp. 57,000 (/kg)	Rp. 52,000
Unsalted butter	800 g	Rp. 85,000 (/500g)	Rp. 136,000
Eggs	30 pcs	Rp. 22,000 (/10 pcs)	Rp. 66,000
Caster sugar	900 g	Rp. 20,000 (/1kg)	Rp. 18,000
Cocoa powder	250 g	Rp. 16,000 (/250g)	Rp. 16,000
Milk	750 ml	Rp. 18,500 (/L)	Rp. 13,900
Choco chips	250 g	Rp. 15,000 (/150g)	Rp. 24,900
Pumpkin flour	1000 g	Rp. 44,000	Rp. 44,000
Mocaf flour	250 g	Rp. 14,500 (/500g)	Rp. 7,250
Vanilla extract	40 ml	Rp. 25,000 (/50ml)	Rp. 20,000
Salt	20 g	Rp. 10,000 (/kg)	Rp. 200
Gas	3 kg	Rp. 20,000(/kg)	Rp. 60,000
<b>TOTAL (/day)</b>			<b>Rp. 458,250</b>
<b>TOTAL (/month)</b>			<b>Rp. 11,456,250</b>

## 6. Rent Cost

**Table 4. 9** Rent Cost

Facility	Size	Price	Sub Total
Stand	2m x 2m	Rp. 2,000,000 (/month)	Rp. 2,000,000
<b>TOTAL (/month)</b>			<b>Rp. 2,000,000</b>

## 7. Total Cost

Fixed Cost = Labor Cost and Rent Cost

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

$$\begin{aligned}\text{Total Cost (/month)} &= \text{Labor} + \text{Raw Material} + \text{Packaging} + \\ &\quad \text{Utility} + \text{Rent Cost} \\ &= \text{Rp. } 4,000,000 + \text{Rp. } 11,456,250 + \\ &\quad \text{Rp. } 1,907,500 + \text{Rp. } 305,000 \\ &= \text{Rp. } 17,668,750\end{aligned}$$

### 4.4.2 Selling Price

$$\begin{aligned}\text{Product Price} &= \frac{\text{Total Cost (/month)}}{\text{Total Product Units (/month)}} \\ &= \frac{\text{Rp. } 17,668,750}{750 \text{ portions}} \\ &= \text{Rp. } 23,558.33 / \text{portion}\end{aligned}$$

$$\begin{aligned}\text{Product Selling Price} &= \text{Product Price} + \left( \begin{array}{l} \text{Product Price} \times \\ \text{Profit Presentage} \end{array} \right) \\ &= \text{Rp. } 23,558.33 + (\text{Rp. } 23,558.33 \times 50\%) \\ &= \text{Rp. } 23,558.33 + \text{Rp. } 11,779.83 \\ &= \text{Rp. } 35,337.33 \\ &= \text{Rp. } 35,500.00\end{aligned}$$