

## CHAPTER IV

### RESULT AND DISCUSSION

#### 4.1 Product Result

Typically, noodles are made from wheat flour, which contains gluten compounds. Gluten contributes to the elasticity and non-breaking texture of noodle products (Paker, 2003). The texture and elasticity of noodles are influenced by the gluten content in the ingredients, the proportion of amylose and amylopectin, as well as the dough-making process. Additionally, the elasticity is affected by the composition of the dough (Rosmauli, 2016). Keluwih flour, on the other hand, does not contain gluten and has a low protein content. This will affect the breaking strength and hedonic quality of the noodles. Keluwih is a local plant that has the potential to be processed into flour as an alternative substitute for wheat. This is due to the presence of glutelin in keluwih. The glutelin content in keluwih seeds is approximately 23% (Pitojo, 2005).

The nutritional value of keluwih noodles depends on its ingredients. The main ingredient of keluwih noodles is keluwih flour. Keluwih flour is a fine-grained flour produced through sieving, which has a grayish color and a distinct aroma. The production process involves drying the keluwih flour. Keluwih flour has the potential to be an alternative food source due to its relatively high carbohydrate and protein content. According to the Indonesian Ministry of Health (2009), kluwih fruit contains the following chemical composition per 100g: 27.2g carbohydrates, 70g water, 1.5g protein, 0.3g fat, 1g ash, 118 kcal energy, 28mg calcium, 32mg phosphorus, 0.9mg iron, 20 $\mu$ g total carotene, 0.1mg thiamine, and 19mg vitamin C. The nutritional content of keluwih fruit used to make flour consists of 8.8% protein, 5.6% total fat, 64.9% total carbohydrates, 8.2% fiber, 1.5% ash, 0.06% phenol, and 10.8% water (per 100g of the ingredient). The moisture content of keluwih flour is lower than that of wheat flour, approximately 14.5% (SNI, 2009).



Minerals found in keluwih include sulfur, iron, phosphorus, and copper. This is one of the reasons for the high ash content in keluwih flour, which is 3.050%. The ash content of keluwih flour is relatively higher compared to wheat flour, which is 0.70% (SNI, 2009), due to the higher mineral content in keluwih flour. As the substitution of keluwih flour increases, the color of the wet noodles becomes darker. This is because of the presence of phenolic compounds in keluwih, which affect the starch color (Sukatiningsih, 2005). According to Sukatiningsih (2005), keluwih seeds contain 0.061% phenolic compounds that can cause enzymatic browning, resulting in a dark color when stored or processed into flour.

## 4.2 Nutrition Fact

### 4.2.1 Nutrition Table

Keluwih processed into flour has a good nutritional content for consumption. The nutritional value of Keluwih Flour is as follows:

**Table 4. 1** Nutrition Value of Keluwih Flour per 100 g

Nutrition	Keluwih Flour (%)
Protein	8,8%
Fat	5,6%
Carbohydrate	64,9%
Fiber	8,2%
Ash	1,5%
Fenol	0,06%
Mineral	10,8%

Source: (Sukatiningsih, 2005)

Table 4.1 shows that keluwih flour has a balanced nutritional profile, including carbohydrates, fats, fiber, and protein, which are quite good. The fat content in keluwih flour affects the taste and aroma when processed into a product, while the phenolic compounds in keluwih flour



cause the starch color to turn brown. The fiber content in keluwih seeds is quite good, which can help lower cholesterol levels in the body. Keluwih flour has a high carbohydrate content, indicating that keluwih seed flour has the potential to be a source of carbohydrates (Sukatiningsih, 2005).

#### 4.2.2 Nutrition Calculation

**Table 4. 2** Nutritional Value of Ingredients used in The Recipe for Chicken Keluwih Noodles

<b>Ingredients</b>	<b>Calories (kcal)</b>	<b>Carbohydrate (g)</b>	<b>Protein (g)</b>	<b>Fat (g)</b>	<b>Sugar (g)</b>	<b>Fiber (g)</b>	<b>Sodium (mg/100g)</b>
Keluwih Flour (50 g)		0.3245	0.044	0.028		0.041	
Corn starch (20 g)	71	14.74	1.84	0.78		1.4	
Rice Flour (10 g)	8	8	0.7	0.14	0.01	0.24	
Tapioca Flour (20 g)		8.9	0.11	0.05		0.09	1
Xanthan Gum (5 g)	15	3,5				3,5	0.005
Warm Water (100 ml)							
Cooking Oil (14 ml)	70			11			
Salt (3 g)							38.758
Chicken Breast Fillet (25 gr)	49		7.39	1.93			98
Pokchoy (50 g)	6	0.50	0.75			0.35	
Soy Sauce (14 ml)	8	1.22	1		0.27	0.1	902

Oyster Sauce (14 ml)	25	5	1		4		820
Sesame Oil (14 ml)	120			13.6			
White Pepper (2 g)	7	1.288	0.2	0.136		0.02	
White Sugar (2.5 g)	8	2.1			2.1		
Spring Onion (10 g)	3.2		0.18	0.02	0.23	0.26	
Fried Shallots (5 gr)	2	0.51	0.05	1.5	0.21	0.1	0.30
Garlic (7 gr)	9	2	0.4	0.04	0.07	0.1	1
<b>TOTAL</b>	<b>401.2</b>	<b>48.0825</b>	<b>13.664</b>	<b>29.224</b>	<b>6.89</b>	<b>6.201</b>	<b>1,861</b>

#### 4.2.3 Nutrition Label

<b>Nutrition Facts</b>	
1 servings per container	
<b>Serving size</b>	<b>1 Bowl (200g)</b>
<b>Amount Per Serving</b>	
<b>Calories</b>	<b>400</b>
<small>% Daily Value*</small>	
<b>Total Fat</b> 29g	<b>37%</b>
Saturated Fat 29.22g	<b>146%</b>
<i>Trans Fat</i> 0g	
<b>Sodium</b> 1860mg	<b>81%</b>
<b>Total Carbohydrate</b> 49g	<b>18%</b>
Dietary Fiber 6g	<b>21%</b>
Total Sugars 7g	
Includes 0g Added Sugars	<b>0%</b>
<b>Protein</b> 14g	<b>28%</b>
<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 Facts of Chicken Keluwih Noodles



## **4.3 Food Safety and Packaging**

### **4.3.1 Processing and Storage Temperature**

Noodles are a commonly consumed food product in Indonesian society. Stored food items can undergo spoilage if wet noodles exhibit characteristics such as white or black spots due to mold growth, sliminess on the noodle surface, a sour odor, and darker color. Wet noodles can have a longer shelf life if they are dried by being baked in an oven (Anonim, 2005 in Andriyani, 2008). Based on their consumption state, noodles can be classified into several categories, namely wet noodles, dried noodles, boiled noodles, steamed noodles, and instant noodles. Wet noodles, also known as yellow noodles, are noodles that have been boiled and have a water content of around 52%, making their shelf life relatively short. They can only last for about 10-12 hours at room temperature. After that, the noodles will develop a sour smell and become slimy, commonly referred to as spoiled noodles (Widyaningsih and Murtini, 2006).

The process of making noodles involves several stages, including mixing, resting to allow the dough to rise, sheet forming or shaping, and cooking. Mixing aims to develop gluten and ensure the homogeneous distribution of ingredients. Prior to sheet forming, the dough is usually rested to allow for water absorption and gluten formation. Extended resting of the dough made from hard wheat will result in softer noodles. Sheet forming using a rolling press leads to the formation of fine and extensible gluten fibers (Anonim, 2003 in Andriyani, 2008). According to Harahap (2009), during the initial mixing, thin layers of water and flour are broken down. Over time, all parts of the flour will be hydrated, resulting in dough lumps. Water causes the gluten fibers to swell as gluten absorbs water. Through heating, the gluten fibers are pulled, cross-linked, and envelop the starch, resulting in a soft, firm, and



elastic dough. The noodle-making process requires various additives, each serving a specific purpose, such as increasing volume, improving quality, taste, and color (Rustandi, 2011).

#### 4.3.2 Shelf Life

Noodles can be classified into several categories, including wet noodles, dried noodles, boiled noodles, steamed noodles, and instant noodles. Wet noodles, also known as yellow noodles, are noodles that have been boiled and have a water content of around 52%, making their shelf life relatively short. They can only last for about 10-12 hours at room temperature. After that, the noodles will develop a sour smell and become slimy, commonly referred to as spoiled noodles (Widyaningsih and Murtini, 2006). Stored wet noodles can undergo spoilage, characterized by white or black spots due to mold growth, sliminess on the noodle surface, a sour odor, and darker color. Wet noodles can have a longer shelf life if they are dried by being baked in an oven (Anonim, 2005 in Andriyani, 2008).

#### 4.3.3 Product Packaging

The principal roles of food packaging are to protect food products from outside influences and damage, to contain the food, and to provide consumers with ingredient and nutritional information (Coles 2003).

Chicken Keluwih Noodles is a ready-to-eat food, where it is usually served in a serving bowl. Since it is cook-by-order food, it is suggested to immediately served and eaten while it is still warm. However, global population is now entering into digital era, where things are put into an online platform, including foods. As the result, foods are now available to be ordered through online platform, as well. Therefore, Chicken Keluwih Noodles requires a



certain packaging while being delivered to customers.

Plastic packaging is one of the options, and Thinwall uses polypropylene or PP plastic as its main material. Due to its plastic composition, Thinwall packaging is waterproof, strong, and heat-resistant. All polypropylene plastics packaging that has direct contact with either food or beverage has fully met the safety requirements (Tice, 2002). Moreover, polypropylene is low water vapour transmission, good resistance to grease and chemicals, and high temperature stability (Raj, 2020), which makes it safe for Chicken Keluwih Noodles.

Polypropylene plastic bowl or Thinwall bowl have dimensions of 11,5 cm x 6 cm (400 ml)



**Figure 4. 2** Polypropylene Plastic Bowl 400 ml

The packaging label for the Chicken Keluwih Noodles includes information; such as product name, product excellences, ingredients, nutrition fact table, and contact lists (see Appendix).





Figure 4. 3 Logo



Figure 4. 4 Label

#### 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. As for raw material, the quantity of raw materials is counted as 30 recipes per day or 750 recipes per month, which are 30 portions per day or 750 portions per month.



1. Start-Up Capital

**Table 4. 3** Start-Up Capital

Tools and Equipment	Quantity	Price(/unit)	Sub Total
Measuring cup	1	Rp 20,000	Rp 20,000
Measuring spoon	1	Rp 27,000	Rp 27,000
Digital Scale	1	Rp 75,000	Rp 75,000
Large Mixing Bowl	2	Rp 100,000	Rp 200,000
Small Mixing Bowl	3	Rp 50,000	Rp 150,000
Frying Pan	1	Rp 94,000	Rp 94,000
Sauce pot	1	Rp 170,000	Rp 170,000
Wooden Spatula	1	Rp 25,000	Rp 25,000
Food Strainer	1	Rp 20,000	Rp 20,000
Spoon	4	Rp 2,000	Rp 8,000
Fork	4	Rp 2,000	Rp 8,000
Cutting Board	1	Rp 50,000	Rp 50,000
Knife	1	Rp 100,000	Rp 100,000
Rolling Pin	2	Rp 55,000	Rp 110,000
Parchment Paper	2	Rp 4,500 (/pcs)	Rp 9,000
Sieve	1	Rp 10,000	Rp 10,000
<b>TOTAL</b>			<b>Rp 1,076,000</b>

2. Labour Cost

**Table 4. 4** Labour Cost

Occupation	Personel	Salary(/month)	Sub Total
Chef	1	Rp 3,500,000	Rp 3,500,000
Cook Helper	1	Rp 2,500,000	Rp 2,500,000
Administration Officer	1	Rp 1,750,000	Rp 1,750,000
<b>TOTAL</b>			<b>Rp 7,750,000</b>



### 3. Packaging Cost

**Table 4. 5** Packaging Cost

Packaging	Quantity	Price (/unit)	Sub Total
PP Thinwall Bowl	30 pcs	Rp 15,000(/25 pcs)	Rp 18,000
Plastic Bag	30 pcs	Rp 8,800 (/100 pcs)	Rp 2,640
Label	30 pcs	Rp 4,000 (/15 pcs)	Rp 8,000
Logo	30 pcs		
<b>TOTAL (/day)</b>			<b>Rp 28,640</b>
<b>TOTAL (/month)</b>			<b>Rp 716,000</b>

### 4. Utility Cost

**Table 4. 6** Utility Cost

Facility	Quantity	Price (/unit)	Sub Total
Water	325 L	Rp 2,600 (/m3)	Rp 845
Electricity	8 kWh	Rp 1,500 (/kWh)	Rp 12,000
Liquefied Petroleum Gas	240 g	Rp 23,000 (/3 kg)	Rp 1,840
<b>TOTAL (/day)</b>			<b>Rp 14,685</b>
<b>TOTAL (/month)</b>			<b>Rp 367,125</b>

### 5. Raw Material Cost

**Table 4. 7** Raw Material Cost

Raw Materials	Quantity	Price (/unit)	Sub Total
Keluwih Fruit	2 kg	Rp 8,000 (/500 g)	Rp 32,000
Corn Starch	600 g	Rp 10,250 (/300 g)	Rp 20,500
Rice Flour	300 g	Rp 7,000 (/500 g)	Rp 4,200
Tapioca Flour	600 g	Rp 6,000 (/500 g)	Rp 7,200
Xanthan Gum	150 g	Rp 25,000 (/100 g)	Rp 37,500
Cooking Oil	420 ml	Rp 20,000 (/1 L)	Rp 8,400
Salt	90 g	Rp 5.000 (/500 g)	Rp 900
Pokchoy	1,500 g	Rp 12,000 (/1 kg)	Rp 18,000



Chicken Breas Fillet	750 g	Rp 55,620 (/1 kg)	Rp 41,715
Soy Sauce	420 ml	Rp 30,000 (/600 ml)	Rp 21,000
Oyster Sauce	420 ml	Rp 50,500 (/770 ml)	Rp 27,545
Sesame Oil	420 ml	Rp 40,500 (/600 ml)	Rp 28,350
White Pepper	60 g	Rp 31,350 (/100 g)	Rp 18,810
White Sugar	60 g	Rp 17,000 (/1 kg)	Rp 1,020
Garlic	210 g	Rp 19,000 (/500 g)	Rp 7,980
Spring Onion	300 g	Rp 6,000 (/100 g)	Rp 18,000
Fried Shallots	150 g	Rp 5,000 (/50 g)	Rp 15,000
<b>TOTAL (/day)</b>			<b>Rp 308,120</b>
<b>TOTAL (/month)</b>			<b>Rp 7,703,000</b>

#### 6. Rent Cost

**Table 4. 8** Rent Cost

Facility	Size	Price	Sub Total
Land	15 m x 5 m	Rp 3,000,000 (/month)	Rp 3,000,000
Building	10 m x 5 m		
<b>TOTAL (/month)</b>			<b>Rp 3,000,000</b>

#### 7. Total Cost

$$\begin{aligned}
 \text{Fixed Cost} &= \text{Labour Cost and Rent Cost} \\
 \text{Variable Cost} &= \text{Raw Material Cost, Packaging Cost, and Utility Cost} \\
 \text{Total Cost (/month)} &= \text{Labour} + \text{Raw Material Cost} + \text{Packaging Cost} + \text{Utility Cost} + \text{Rent Cost} \\
 &= \text{Rp 7,750,000} + \text{Rp 7,703,000} + \\
 &\quad \text{Rp 716,000} + \text{Rp 367,125} + \\
 &\quad \text{Rp 3,000,000} \\
 &= \mathbf{\text{Rp 19,536,125}}
 \end{aligned}$$



#### 4.4.2 Selling Price

$$\begin{aligned}\text{Product Price} &= \frac{\text{Total Cost (/month)}}{\text{Total Product Unit (month)}} \\ &= \frac{\text{Rp } 19,536,125}{750 \text{ Portion}} \\ &= \mathbf{\text{Rp } 26,048.1667 / \text{Portion}}\end{aligned}$$

$$\begin{aligned}\text{Product Selling Price} &= \text{Product Price} + \left( \frac{\text{Product Price} \times}{\text{Profit Percentage}} \right) \\ &= \text{Rp } 26,048.1667 + (26,048.1667 \times 50\%) \\ &= \text{Rp } 26,048.1667 + \text{Rp } 13,024.0833 \\ &= \text{Rp } 39,072,25 \approx \mathbf{\text{Rp } 39,500}\end{aligned}$$