CHAPTER IV
RESULT AND DISCUSSION

4.1 Product Result

The nutritional value of chicken meatball from jackfruit seed starch depends on its ingredients. Major ingredients in chicken meatball from jackfruit seed starch are chicken meat and jackfruit seeds. Chicken meat has high in protein and includes amino acids that the human body need. Aside from protein, chicken meat contains fat, carbs, vitamins, particularly vitamin B complex components, minerals, and water. Each component differs according on the chicken's species, age, and sex. Chicken provides more protein and less calories than beef. According to Directorate of Nutrition, Ministry of Health (2010) chicken meat contains protein of 18.20 grams, fat of 25 grams, and has calories of 404 Kcal per 100 grams of chicken meat. Chicken meat is a source of protein high-quality animal products, containing complete essential amino acids and high unsaturated fatty acids (Muchtadi and Sugiyono, 1992; Yuli 2018).

Jackfruit seeds has a significant potential for usage in a range of processed meals like meatball. In processed meat products, the starch from jackfruit seeds can operate as a filler and binder, particularly for meat products processed with restructured meat technology. Jackfruit seed is a by-product of jackfruit fruit so it has never received special attention in its use. Jackfruit seed flour contains nutritional components including 12.40% water, 3.24% ash, 12.19% protein, 1.12% fat, 71.05% carbohydrates, and 2.74% crude fiber (Republic of Indonesia's Ministry of Industry, 2012, Tasya 2020).

4.2 Nutrition Fact

4.2.1 Nutrition Table

The nutritional value of Chicken meat is as follows:

Table 4.1 Nutrition Value of Chicken Meat per 100 g

Calorie (Cal)	156
Protein (g)	31

Fat (g)	3.6

Source: Amy *et al.*, 2022; Melissa *et al.*, 2022

Table 4.2 Nutrition Value of Jackfruit Seed per 100 g

Calorie (Cal)	185.63
Water (g)	64.5
Carbohydrate (g)	38.4
Protein (g)	7.04
Fiber (g)	1.5
Fat (g)	0.43
Iron (mg)	1.5
Potassium (mg)	216
Phosphorus (mg)	97
Sodium (mg)	63.2
Magnesium (mg)	54
Calcium (mg)	50
Vitamin C (mg)	11
Riboflavin (mg)	0.3
Thiamine (mg)	0.25
Vitamin A (IU)	17

Source: Dr. Rajeev *et al*., 2023

4.2.2 Nutrition Calculation

Table 4.3 Nutrition Value of ingredients useds in the recipe for Chicken Meatballs from Jackfruit Seed Starch

Ingredients	**Calories (Cal)**	**Carbohydrate (g)**	**Protein (g)**	**Fat (g)**	**Sugar (g)**	**Fiber (g)**	**Sodium (mg/100g)**
Chicken Meat (400 g)	624	-	124	14.4	-	-	-

Jackfruit Seed (50 g)	92.8	19.2	3.52	0.21	-	0.75	31.6
Tapioca Starch (25 g)	89.4	22.2	0.05	0.005	0.83	0.22	0.25
Garlic (5 g)	5.9	1.65	0.31	0.025	0.05	-	8.3
Shallot (4 g)	1.68	0.40	0.03	0.003	0.17	-	0.125
Ice Cubes	-	-	-	-	-	-	-
Egg (52 g)	74	0.7	6.3	5.2	0.15	-	70
Sugar (10 g)	38.7	9.98	-	-	9.98	-	-
Salt (8 g)	-	-	-	-	-	-	3,000
TOTAL	**926.48**	**54.13**	**134.21**	**19.84**	**11.18**	**0.97**	**3,110**

4.2.3 Nutrition Label

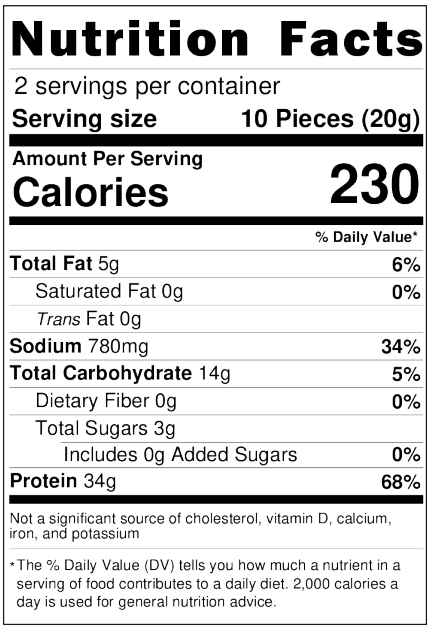

Figure 4.1 Nutrition Fact of Chicken Meatball from Jackfruit Seed Starch

4.3 Food Safety and Packaging

4.3.1 Processing and Storage Temperature

A chicken meatball's ingredients are put together in a specific order. The operations units stated are drying, mixing, shaping, and cooking/boiling. In order to get the meatball ready for the next stage, each operation unit has its own objectives.

Drying is the first step in making jackfruit seed starch and is intended to eliminate or reduce unwanted biological activity, such as enzyme and microbial activity. However, during the drying process damage to nutrients and factors that determine the quality of food ingredients also occur. The drying process to become jackfruit seed flour, is done by leaving food in the sun, known as drying naturally. For the next step is mixing, where all the ingredients are mixed into a dough. With the exception of the ice cubes, combine all the ingredients in random order. While the ingredients are being combined, ice cubes are added in accordance with the desired texture.

In the process of shaping the dough, shaping can be done using hands and a spoon that has been dampened in water. After being formed according to the desired size and shape it is cooked by boiling it. Boiling meatballs also keeps them juicy and flavorful, as well as being a healthy way of cooking them. Moreover, boiling process will make the immersed uncooked meatball dough to float on the water surface, this is due to the expanded mass of the dough followed by changing in specific gravity and as a sign that meatball is completely cooked (Mursidi *et al*., 2019).

4.3.2 Self Life

Food shelf life stored by refrigeration range between a few days to several weeks depending on the type of material food freezing can last from several months to several years (Afrianti, 2018). Meat spoilage can also be prevented by using the right storage temperature. Refrigeration of food at low temperatures is used to extend the shelf life of food. Chicken meatball is categorized as wet food, like Tekwan or Pempek, with moisture content can be up to 60-80% (Dyah dan Regina, 2007; Tahrir,

2019). Because of the enzyme and microbial activity that this high moisture content will cause, meatballs can only be kept at room temperature for a short period of time (25-30 hours). However, keeping wet foods like meatballs in a cold environment (0-5) will increase their shelf life to 72 hours, and with vacuumed packaging, it may be kept for up to 120 hours.

4.3.3 Product Packaging

Food packaging serves purposes of food product safety and easy handling and transport by preventing chemical contamination and enhancing shelf life, which provides convenience for consumers. Various types of materials, including plastics, glass, metals, and papers and their composites, have been used for food packaging (Alamri *et al*., 2021). Food protection must be balanced with other concerns, such as energy and material costs, growing social and environmental awareness, and strict regulations on pollutants and municipal solid waste disposal. Foods may be transported securely across great distances from their point of origin while still being wholesome at the time of consumption due to packing, which maintains the benefits of food processing after the procedure has finished.

This Chicken Meatballs from Jackfruit Seed Starch is a frozen food products. Due to the usage of vacuum plastic, frozen food that can be marketed outside of the city has a longer shelf life. However, the worldwide populace is now living in the digital age, when everything, even food, is posted online. As a result, it is now possible to order food through websites or online stores like Shopee or Tokopedia.

The selected packaging for Chicken Meatball from Jackfruit Seed Starch is plastic based. Nylon plastic can be used for vacuumed frozen food. Nylon plastic material is a type made from a combination of two materials, namely nylon and polyethylene (PE). The combination of these two types of plastic makes a nylon plastic that has more strength for a number of things related to packaging. This material is often referred to

as vacuum plastic. The vacuum method is indeed one of the most widely applied methods to make food last longer in packaging.

The vacuum plastic for the Chicken Meatball from Jackfruit Seed Starch have dimensions of 15cm x 20cm

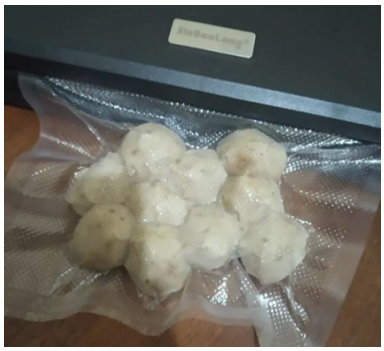

Figure 4.2 Vacuum Plastic

Packaging also provides consumers initial product identity before deciding whether to purchase it. Also, consumer demand is changing and now includes such diverse packaging as active and intelligent packaging. These packaging system interact and respond to the food-packaging environment, where they release some substances in or scavenge some from the packaging headspace and prolong the shelf life of food products (Robertson, 2006; Alamri *et al*., 2021). The packaging label for the Chicken Meatball from Jackfruit Seed Starch includes information; such as product name, ingredients, nutrition fact table, and contact list.

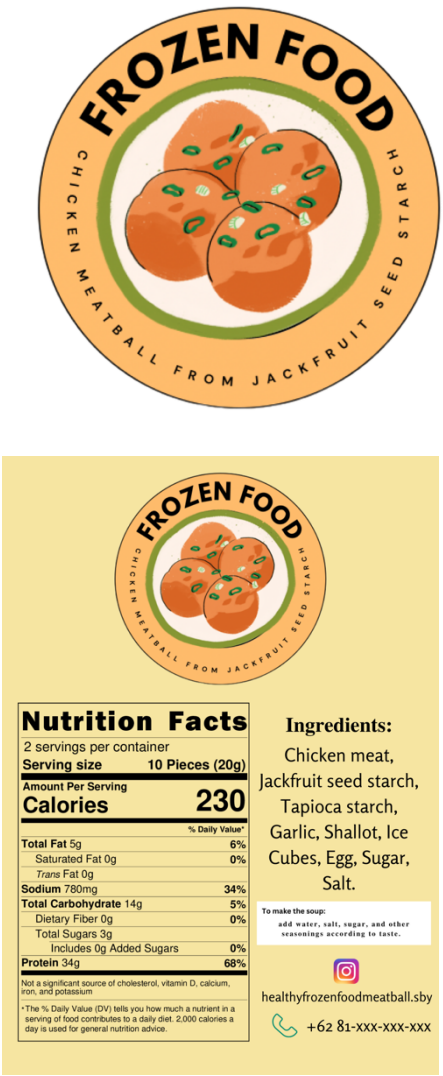

Figure 4.3 Logo

4.4 Financial Aspects

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

The total monthly cost is used to compute product costs. The expenses are broken down into labor, raw material, packaging, and utility charges. For raw materials, 24 recipes per week or 96 recipes per month are used, which equates to 13 portions per day or 330 portions per month.

1. Start-Up Capital

Table 4.4 Start-Up Capital

Tools and Equipment	Quantity	Price (/unit)	Sub Total
Knife	2	Rp. 105,000	Rp. 210,000
Cutting Board	2	Rp. 48,000	Rp. 96,000
Chopper	1	Rp. 150,000	Rp. 150,000
Pot	1	Rp. 111,000	Rp. 111,000
Spoon	2	Rp. 2,000	Rp. 4,000
Glass	1	Rp. 5,000	Rp. 5,000
Bowl	2	Rp. 40,000	Rp. 80,000
Digital Scale	1	Rp. 50,000	Rp. 50,000
	TOTAL		**Rp. 706,000**

2. Packaging Cost

Table 4.5 Packaging Cost

Packaging	Quantity	Price (/unit)	Sub Total
Vacuum Plastic (15cm x 20 cm)	20 pcs	Rp. 425	Rp. 8,500
Bubble Wrap (25 cm x 20 cm	20 pcs	Rp. 88	Rp. 1,760
Box (22 cm x 12 cm x 10 cm)	20 box	Rp. 850	Rp. 17,000
	TOTAL (/day)		**Rp. 27,260**
	TOTAL (/month)		**Rp. 681,500**

3. Utility Cost

Table 4.6 Utility Cost

Facility	Quantity	Price (/unit)	Sub Total
Water	500L	Rp. 2,000 (/m3)	Rp. 1,000
Electricity	10 kWh	Rp. 1,500 (/kWh)	Rp. 15,000

TOTAL (/day)	**Rp. 16,000**
TOTAL (/month)	**Rp. 400,000**

4. Raw Material Cost

Table 4.7 Raw Material Cost

Raw Materials	Quantity	Price (/unit)	Sub Total
Chicken Fillet	1,6kg	Rp. 29,000 (/kg)	Rp. 46,400
Jackfruit Seed Starch	200 g	Rp. 30,000 (/500 g)	Rp. 12,000
Tapioca Starch	100 g	Rp. 7,000 (/500 g)	Rp. 1.400
Garlic	4 pcs	Rp. 500	Rp. 2,000
Shallot	4 pcs	Rp. 550	Rp. 2,200
Egg	4 pcs	Rp. 2,500 (/pcs)	Rp. 10,000
Sugar	40 g	Rp. 15,000 (/kg)	Rp. 300
Salt	32 g	Rp. 10,000 (/kg)	Rp. 320
Gas (12kg)	3 kg	Rp. 20,000 (/kg)	Rp. 60,000
TOTAL (/day)			**Rp. 134,620**
TOTAL (/month)			**Rp. 3,365,500**

5. Total Cost

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

Total Cost (/month) = Raw Material Cost + Packaging Cost + Utility Cost

= 3,365,500 + 681,500 + 400,000

= **Rp. 4,447,000**

4.4.2 Selling Price

Product Price $= \frac{Total\ Cost\ (\ /month)}{Total\ products\ Units\ (\ /month)}$

$= \frac{Rp.4{,}447{,}000}{330}$

= **Rp. 13,475**

Product Selling Price = Product Price + (Product Price x Profit Percentage)

= Rp. 13,475 + (Rp. 13,475 x 100%)

=Rp. 13,475 + Rp. 13,475

= Rp. 26,950 ≈ Rp. 27,000