# CHAPTER IV

# RESULT AND DISCUSSION

## 4.1 Product Result

The creation of vegetarian nugget analogs using eggplants, tofu, enoki mushrooms, and oyster mushrooms has yielded impressive results. Each ingredient contributes its unique qualities to the final product. Eggplants, with their mild flavor and hearty texture, provide a substantial base while adding a hint of earthiness. Tofu, rich in protein and adept at absorbing flavors, offers a meaty consistency and an excellent umami boost. Enoki mushrooms enhance the nuggets with their delicate umami notes, while oyster mushrooms take it a step further by infusing a deep, savory richness. The amalgamation of these ingredients results in nuggets that boast a complex, meat-like taste and a satisfying texture. This discussion underscores the potential of plant-based ingredients to create vegetarian nugget analogs that are not only delicious but also nutritious, catering to a growing demand for sustainable and appetizing meat alternatives.

## 4.2 Nutrient Facts

Eggplants are notable for their nutritional value, offering a wealth of vitamins, minerals, and dietary fiber. Enoki mushrooms, on the other hand, provide a unique set of nutrients and are particularly rich in vitamins B3 and B5. Oyster mushrooms are known for their health benefits, boasting significant levels of antioxidants and essential minerals such as zinc. Tofu, a versatile soy-based protein, is celebrated for its low-fat content and high protein quality, making it a favored choice among health-conscious individuals. Each of these ingredients contributes distinct nutritional advantages, making them valuable components of a balanced diet.

### 4.2.1 Nutrition Table

The nutritional value of Oyster Mushroom is as follows

**Table 4. 1** Nutritional value of Oyster Mushroom per 100gr

| | |
|---|---|
| Calorie (kcal) | 33 |
| Fat (g) | 0.4 |
| Carbohydrates (g) | 6.1 |
| Protein (g) | 3.3 |
| Sodium (mg) | 18 |
| Calcium (mg) | 3 |
| Potassium (mg) | 420 |
| Iron (mg) | 1.3 |

Except for the nutritional value inside the table oyster mushroom also contain vitamin D about 0.7 mcg.

The nutrition value of Enoki Mushroom is as follows

**Table 4. 2** Nutrition Value of Enoki mushroom per 100 gr

| | |
|---|---|
| Calorie (Kcal) | 37 |
| Fat (g) | 0.3 |
| Protein (g) | 2.7 |
| Carbohydrate (g) | 7.8 |
| Fiber (g) | 2.7 |
| Iron (mg) | 1.2 |
| Potassium (mg) | 359 |

The nutritional value of Eggplant is as follows

**Table 4. 3** *Nutritional value of Eggplant per 100gr*

| | |
|---|---|
| Calorie (kcal) | 25 |
| Fat (g) | 0.2 |
| Carbohydrates (g) | 5.9 |
| Protein (g) | 1 |
| Sodium (mg) | 2 |
| Calcium (mg) | 9 |
| Potassium (mg) | 229 |

| | |
|---|---|
| Iron (mg) | 0.2 |

The nutritional value of Tofu is as follows

**Table 4. 4** Nutritional value of Tofu per 100gr

| Calorie (kcal) | 76 |
|---|---|
| Fat (g) | 4.8 |
| Carbohydrates (g) | 1.9 |
| Protein (g) | 8.1 |
| Sodium (mg) | 7 |
| Calcium (mg) | 350 |
| Potassium (mg) | 121 |
| Iron (mg) | 5.4 |

### 4.2.2 Nutrition Calculation

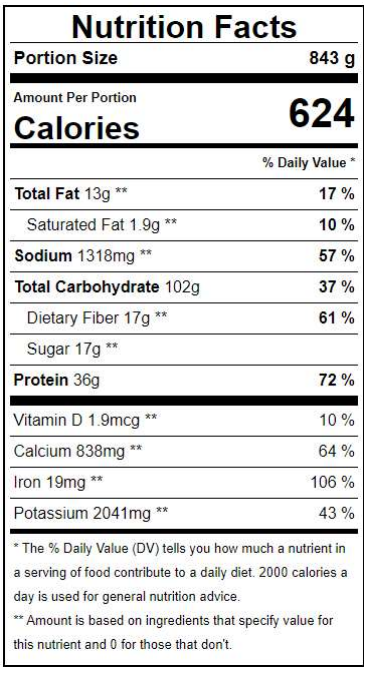
The nutrition value of ingredients used in the making of this vegetarian nuggets

**Table 4. 5** Nutritional Value of Ingredients used in the making of this vegetarian nuggets

| **Ingredients** | **Calories (kcal)** | **Carbohydrate (g)** | **Protein (g)** | **Fat (g)** | **Fiber (g)** | **Sodium (mg)** |
|---|---|---|---|---|---|---|
| Oyster Mushroom (250gr) | 83 | 15 | 8.3 | 1 | 5.8 | 45 |
| Enoki mushroom (100g) | 37 | 7.8 | 2.7 | 0.3 | 2.7 | 3 |
| Tofu (225g) | 171 | 4.2 | 18 | 11 | 0.7 | 16 |
| Eggplant (65g) | 16 | 3.8 | 0.6 | 0.1 | 2 | 1.3 |
| Garlic (20g) | 29 | 5.6 | 1.3 | 0.1 | 0.5 | 0 |
| Onion (70g) | 28 | 6.5 | 0.8 | 0.1 | 1.2 | 2.8 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Tomato Ketchup (24ml) | 28 | 7.1 | 0 | 0 | 0 | 226 |
| Black-pepper (3g) | 7.5 | 1.9 | 0.3 | 0.1 | 0.8 | 0.6 |
| Paprika Powder (3g) | 8.5 | 1.6 | 0.4 | 0.4 | 1.1 | 2 |
| Mushroom stock powder (4g) | 13 | 2.6 | 0.4 | 0.2 | 0.2 | 263 |
| All Purpose Seasoning Powder (4g) | 0 | 0 | 0 | 0 | 0 | 800 |
| Water (20ml) | 0 | 0 | 0 | 0 | 0 | 0 |
| All-purpose flour (20g) | 73 | 15 | 2 | 0 | 0.7 | 0 |
| Cornstarch (25g) | 95 | 23 | 0.1 | 0 | 0.2 | 2.3 |
| Breadcrumb (10g) | 35 | 7.5 | 1 | 0 | 0.5 | 15 |
| **TOTAL** | 464 | 101.6 | 35.9 | 13.3 | 16.4 | 1377 |

### 4.2.3 Nutrition Label



**Nutrition Facts**

| | |
|---|---|
| **Portion Size** | **843 g** |
| Amount Per Portion **Calories** | **624** |
| | % Daily Value * |
| **Total Fat** 13g ** | **17 %** |
| Saturated Fat 1.9g ** | **10 %** |
| **Sodium** 1318mg ** | **57 %** |
| **Total Carbohydrate** 102g | **37 %** |
| Dietary Fiber 17g ** | **61 %** |
| Sugar 17g ** | |
| **Protein** 36g | **72 %** |
| Vitamin D 1.9mcg ** | 10 % |
| Calcium 838mg ** | 64 % |
| Iron 19mg ** | 106 % |
| Potassium 2041mg ** | 43 % |

* The % Daily Value (DV) tells you how much a nutrient in a serving of food contribute to a daily diet. 2000 calories a day is used for general nutrition advice.

** Amount is based on ingredients that specify value for this nutrient and 0 for those that don't.

**Figure 4. 1** Nutrition Facts of Vegetarian nugget

### 4.3 Food Safety and Packaging

Packaging plays an essential role in making sure that the quality and preservation of vegetarian nugget analogs made from ingredients like eggplants, enoki mushrooms, and oyster mushrooms. These innovative plant-based products offer a sustainable and delicious alternative to traditional meat nuggets. To maintain their freshness and extend their freezer life, one must consider carefully of how the packaging design and materials are going to be used. First and the crucial part, the packaging of these vegetarian nugget analogs should be designed to create a barrier or protection against air and the level of moisture. These elements depicts the villain when it comes to freezer burn and the spoilage of the food. Vacuum-sealed packaging or airtight containers with proper seals can ensure that the entry of moisture and oxygen can be prevented, preserving the nuggets' taste and texture during long periods of storing in the freezer.

Additionally, the choice of packaging materials is vital for ensuring the long age of these vegetarian nuggets. Packaging materials should be selected and chosen carefully to withstand freezing temperatures without becoming brittle or losing their binding composition. High-quality plastic, freezer-safe bags, or even eco-friendly options like biodegradable and compostable packaging can be considered.

Labeling is another critical aspect when it comes to vegetarian nugget analogs packaging. Clear and informative labeling should include essential details such as the product's name, ingredients, nutritional information, and undoubtedly the instructions to store them. Proper labeling helps consumers understand the handling and storage of the product, ensuring its time in the freezer to be beneficial enough.

To further enhance the life of these nuggets in the freezer, manufacturers may also consider using advanced freezing technologies, such as blast freezing, which the product's temperature rapidly goes low to minimize the formation of ice crystals. This can help maintain the nuggets' quality and prevent freezer-burns, even during extended times of storage.

In conclusion, the packaging of vegetarian nugget analogs made from eggplants, enoki mushrooms, and oyster mushrooms plays a moving role in preserving their quality and extending their freezer life. By using appropriate materials, sealing methods, and labeling practices, manufacturers can ensure that consumers can enjoy these plant-based delights for an extended period while minimizing food waste.

### 4.3.1 Processing and Storage Temperature

The production of this vegetarian nugget is going through a few phase. The first stage is preparing the ingredient like drying the mushrooms, slicing the eggplant, and preparing the onion and garlic like chopping it. The second stage is steaming the main ingredient and also sautéing the onion and garlic. And then the next step is to deep fry the tofu before mixing it with the main ingredient and also wet mix. After mixing it with the wet mix the next process is to steam it so it gets firm and then cutting it into shapes. After that the next process is breading or coating it with flour and also with breadcrumb so when it is fried is gets a nice colour. After that the next process is frying it until its half cooked so it can last longer. The last step is to freeze it in the packaging.

The storage conditions of chicken nuggets depend on whether they are cooked or uncooked. Cooked chicken nuggets can be frozen to extend their shelf life. They will maintain best quality for 2 to 3 months in the freezer, but will remain safe beyond that time. Cooked chicken nuggets that have been kept constantly frozen at 0°F will keep safe indefinitely. Whereas for uncooked chicken nuggets can be kept in the freezer at -

18°C for 1 hour before cooking. The freezer temperature should be kept below 0°F (-18°C).

### 4.3.2 Shelf Life

Frozen chicken nuggets can last for up to 6 months in the freezer if properly stored. They will maintain the best quality for 2 or up to 3 months. While they may still be safe to eat after this time, their quality may deteriorate over time. It is recommended to consume them within this time frame for the best quality. Once thawed in the fridge overnight, cooked chicken nuggets can last for an additional 1-2 days in the fridge.

### 4.3.3 Product Packaging

The ideal material for plastic packaging for vegetarian nugget analogs made from eggplants, oyster mushrooms, and enoki mushrooms would be polyethylene (PE) or polypropylene (PP). These plastics are well-suited for freezer storage due to their excellent moisture and oxygen barrier properties. Specifically, a high-density polyethylene (HDPE) or a polypropylene (PP) packaging with a thickness of at least 2 to 4 mils (0.05 to 0.1 mm) would be suitable. These plastics are durable, flexible, and capable of withstanding the low temperatures of the freezer without becoming brittle, ensuring that the nuggets remain protected from freezer burn and maintain their quality over time.


**Figure 4. 2** High-Density Polyethylene plastic packaging (12x24)

High-density polyethylene (HDPE) plastic offers vast numbers of advantages when it comes to packaging vegetarian nugget analogs. Its durability and strength provide excellent protection against external factors such as moisture, light, and oxygen, ensuring the preservation of the nuggets' quality and flavor. HDPE is also highly resistant to temperature unpredictable changes, which is crucial for keeping frozen or refrigerated products like vegetarian nuggets intact during transportation and storage. Additionally, HDPE's lightweight nature gives way to reduced shipping costs and a lower carbon footprint, making it an environmentally friendly choice. In addition, it is a recyclable material, connecting with the sustainability goals of many manufacturers and consumers in the food industry. To sum up, HDPE plastic stands out as a reliable and practical packaging solution for vegetarian nugget analogs, ensuring their freshness and sustainability throughout the supply chain.


**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 raw material cost, packaging cost, and utility cost. The raw material cost is, is counted as 50 recipes per day, the working day is 5 days a week.

1. Start-Up Capital

**Table 4. 6** Start-Up Capital

| **Tools and Equipment** | **Quantity** | **Price (/unit)** | **Sub Total** |
|---|---|---|---|
| Frying Pan | 1 | Rp. 256.000,00 | Rp. 256.000,00 |
| Steamer | 1 | Rp. 100.000,00 | Rp. 100.000,00 |
| Gastronome | 4 | Rp. 58.500,00 | Rp. 234.000,00 |
| Food Processor | 1 | Rp.1.815.000,00 | Rp.1.815.000,00 |
| Scale | 1 | Rp. 99.900,00 | Rp. 99.900,00 |
| Cutting Board | 1 | Rp. 45.000,00 | Rp. 45.000,00 |
| Cloth | 1 | Rp. 5.000,00 | Rp. 5.000,00 |
| Chef Knifes | 1 | Rp. 290.000,00 | Rp. 290.000,00 |
| Strainer | 1 | Rp. 40.000,00 | Rp. 40.000,00 |
| Tongs | 1 | Rp. 38.000,00 | Rp. 38.000,00 |
| Vacuum Seal | 1 | Rp. 1.100.000,00 | Rp.1.100.000,00 |
| **TOTAL** | | | Rp.4.022.900,00 |

2. Packaging Cost

**Table 4. 7** Packaging Cost

| **Packaging** | **Quantity** | **Price (/unit)** | **Sub Total** |
|---|---|---|---|
| Plastic | 25 | Rp.2.500,00 | Rp. 62.500,00 |
| Sticker Logo | 25 | Rp. 500,00 | Rp. 12.500,00 |
| Sticker Label | 25 | Rp. 300,00 | Rp. 7.500,00 |
| **TOTAL (/day)** | | | Rp. 82.500,00 |
| **TOTAL (/month)** | | | Rp. 1.815.000,00 |

3. Utility Cost

**Table 4. 8** Utility Cost

| Facility | Quanti ty | Price (/unit) | Sub Total |
|---|---|---|---|
| Water | 3 $m^3$ | Rp 2.100,00/ $m^3$ | Rp. 6.300,00 |
| Gas | 150 gr | Rp. 188.000,00/3 Kg | Rp. 9.400,00 |
| Electricity | 0.25 Kwh | Rp 1.500,00/ Kwh | Rp. 375,00 |
| **TOTAL** (/day) | | | Rp. 16.075,00 |
| **TOTAL** (/month) | | | Rp.353.650,00 |

4. Raw Material Cost

**Table 4. 9** Raw Material Cost

| Ingredients | Quantity | Price (/unit) | Sub Total |
|---|---|---|---|
| Oyster Mushroom | 6.250 gr | Rp 14.500,00 /200g | Rp. 453.125,00 |
| Enoki mushroom | 2500 gr | Rp. 3.500,00/100g | Rp. 87.500,00 |
| Tofu | 5625 gr | Rp. 11.438,00/ 1kg | Rp. 64.338,75 |
| Eggplant | 1625 gr | Rp. 14.000,00/1 kg | Rp. 22.750,00 |
| Garlic | 500 gr | Rp. 37.900,00/ kg | Rp. 18.950,00 |
| Onion | 1725 gr | Rp. 34.500,00/ kg | Rp. 59.512,05 |
| Tomato Ketchup | 600 ml | Rp. 35.000,00/ 552ml | Rp. 38.043,00 |
| Black-pepper | 75 gr | Rp. 27.000,00/ 250gr | Rp. 8.100,00 |
| Paprika Powder | 75 gr | Rp. 62.000,00/ 500gr | Rp. 9.300,00 |
| Mushroom stock powder | 100 gr | Rp. 47.000,00/ 400gr | Rp. 11.750,00 |
| All-purpose herb seasoning powder | 100 gr | Rp. 6.600,00/ 100gr | Rp. 6.600,00 |
| Water | 500 ml | Rp. 5.500,00/ 1.5L | Rp. 1.833,33 |
| All-purpose flour | 500 gr | Rp. 15.375,00/ kg | Rp. 7.687,00 |
| Cornstarch | 625 gr | Rp. 16.000,00/ kg | Rp. 10.000,00 |
| Breadcrumb | 250 gr | Rp. 20.000,00/ kg | Rp. 5.000,00 |
| **TOTAL (/Day)** | | | Rp. 804.487,08 |
| **TOTAL (/Month)** | | | Rp. 17.698.715,8 |

5. Total cost

Variable Cost = Raw Material, Packaging, Utility Cost

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

= 17.698.715,8+1.815.000,00+ 353.650,00

= Rp.19.867,365,8

**4.4.2 Selling Price**

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

= $\frac{\text{Rp. 19.867,365,8}}{550}$

= Rp. 36.122.5

= Rp. 37.000,00

Product Selling Price = Product Price + ( product price × profit percentage)

= Rp. 37.000+ ( Rp37.000× 75%)

= Rp. 37.000+ Rp. 27.750

= Rp 64.750 / pax

= Rp.65.000,00/ pax