

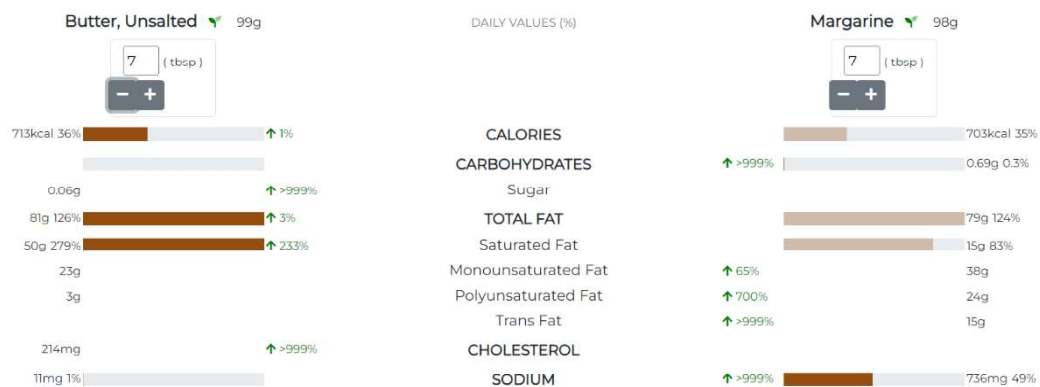
## CHAPTER IV

### RESULT AND DISCUSSION

#### 4.1 Product Result

In general, potato spread made is a vegetable spread made from potato as the main ingredient that is mashed, making a fine texture with added seasoning for flavouring. The texture was slightly different from that of the mash potato, with a creamy taste from margarine mixed with corn flour to make it more concentrated and a savory taste from aromatic spices mixed during the potato spread making process, such as powdered garlic, onion flakes, oregano, and others. By using additional seasoning that is not included in the unhealthy category, because in this process of making potato spread, it is difficult to use natural ingredients and does not have a negative impact on health. Garlic powder is a versatile and healthy spice that can be used in many different ways. It has many health benefits including boosting the immune system, lowering cholesterol levels, and preventing blood clots (Efe,2022). In one recipe can make 1 bottle jar of potato which is 1 recipe makes 1 product weighing 320 gr. The resulting color on the potato spread is golden brown with a savory aroma and a spicy aroma.

By adding margarine instead of butter, most margarines contained little to zero cholesterol levels, whereas butter contained high cholesterol levels. Therefore, a number of researchers agree that margarine will be relatively healthier than butter-based research based on nutritional information from Universitas Indonesia in July 2022. Uses of margarine in potato spread to help make the starchy texture of potatoes richer and eliminates that "cling" some potatoes get when they're freshly mashed. With the final texture of smooth and creamy, spreadable like jams eventually.



**Figure 4.1** Comparison nutrition butter and margarine

## 4.2 Nutrition Facts

### 4.2.1 Nutrition Table

The nutrition value of steamed potato is follow :

**Table 4.1** Nutrition value of steamed potato per 100 grams

Calories (kcal)	83.5
Proteins (g)	2
Carbohydrates (g)	18
Fats (g)	0.2
Fibre (g)	2
Water (g)	77
Sugar (g)	1

Source : *Calorie-charts.info, 2018*

Interestingly, potatoes do not contain as much starch as flours, baked goods or cereals, but they do contain more starch than other vegetables. For instance, a medium-sized baked potato (138 grams) contains 24.8 grams of starch, or 18% by weight (RD,2023). The starch content of a potato can be highly variable. In general terms fresh potatoes contain ~20% dry matter (DM) of which 60–80% is starch, with 70–80% of this starch as amylopectin. This variability is primarily the result of genotype and growing environment.

#### 4.2.2 Nutrition calculation

With assistance from research and based on nutritional fact calculations contained in the potato spread as follows :

*Table 4.2 Nutritional Value of Ingredients used in potato spread per 1 recipe*

<b>Ingredients</b>	<b>Calories (kcal)</b>	<b>Carbohydrate (g)</b>	<b>Protein (g)</b>	<b>Fat (g)</b>	<b>Fiber (g)</b>	<b>Sugar (g)</b>	<b>Sodium (mg)</b>
Potato (300gr)	250.5	54	6	0.6	6	3	31.7
Corn starch (10gr)	37.5	9.1	-	-	0.1	-	0.9
Margarine (25gr)	182.6	0.2	-	19.7	-	-	0.5
Nutmeg (1gr)	5.2	0.5	0.1	0.4	0.2	-	0.2
Paprika powder (3gr)	8	1.6	0.4	0.4	1	0.3	0.2
Garlic powder (3gr)	9.7	2.1	0.5	-	0.3	0.1	1.8
Onion flakes (4gr)	13.6	3.4	0.4	-	0.4	1.5	0.9
Mustard (7gr)	4	0.4	0.3	0.2	0.3	0.1	77
Salt (5gr)	-	-	-	-	-	-	1928.9
Sugar (5gr)	20	5.2	-	-	-	-	-
Black pepper (2gr)	4.9	1.3	0.2	0.1	0.5	-	0.4
Oregano (2gr)	5.4	1.4	0.2	0.1	0.9	0.1	0.5
<b>TOTAL/ 1 recipe</b>	<b>541.4</b>	<b>79.2</b>	<b>8.1</b>	<b>21.5</b>	<b>9.7</b>	<b>5.1</b>	<b>2043</b>
<b>TOTAL/ 1 serving</b>	<b>16.91</b>	<b>2.475</b>	<b>0.253</b>	<b>0.671</b>	<b>0.3031</b>	<b>0.159</b>	<b>63.84</b>

### 4.2.3 Nutrition Label

<b>Nutrition Facts</b>	
10 servings per container	
<b>Serving size</b>	<b>(32g)</b>
<b>Amount Per Serving</b>	
<b>Calories</b>	<b>15</b>
<small>% Daily Value*</small>	
<b>Total Fat</b> 0.5g	<b>1%</b>
Saturated Fat 0.0125g	<b>0%</b>
<i>Trans</i> Fat 0g	
<b>Sodium</b> 65mg	<b>3%</b>
<b>Total Carbohydrate</b> 2g	<b>1%</b>
Dietary Fiber 0g	<b>0%</b>
Total Sugars 0g	
Includes 0g Added Sugars	<b>0%</b>
<b>Protein</b> 0g	<b>0%</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 4.2 Nutrition label of potato spread

## 4.3 Food Safety and Packaging

### 4.3.1 Processing and storage temperature

The process of making this potato spread product is quite easy and does not require many techniques; it is just that the right measurements and timing will make the quality, taste, texture, and even the resistance of the potato spread can be formed perfectly. All manufacturing processes were arranged according to the correct order, so that they were made according to the procedure. In the first step, the potatoes are steamed with medium heat and the specified time so that they match the specified potato tenderness. If boiling potatoes for too long, potatoes lose their structure and absorb too much water. This means that potatoes become mushy, do not have the correct texture, and do not hold their shape (Blay, 2022).

This is another reason why steaming is superior to boiling: potatoes do not absorb water as they do when boiled, so it ends up with a fuller, richer flavor – no extra cream or butter is required (Spiegel, 2021). Steaming requires only an inch or so of water; it takes much less time to heat than a large pot of water heating to boil and steam, which causes less nutrient loss than boiling.

Then, mixing and blending at the same time, this time to blend the potato evenly, which required a basic blender or hand blender. Blending with the precision of a blender, steamed potatoes are a very practical and easier step; with a blender, the potatoes will release a lot of starch, thus creating a goey and sticky consistency (Vaculin, 2020).

However, with other products added to the mix, an immersion blender is a great way to obtain everything as fine as you want without overdoing it. The final result that will be consumed is fine soft potato spread. To obtain a more concentrated concentration, a mixture of melted margarine and corn starch was added. After all the ingredients were mixed and stirred thoroughly, the solution was stirred so that the smell of the corn starch would disappear completely and activate the performance of the roux. Then chill and storage in a bottle of jar.

Therefore storage of the potato spread must be put in the refrigerator or at a room temperature below 4°C and make sure the potato spread packaging lid must be tightly closed to prevent oxidation and drying out. Cold temperatures slow down the activity of enzymes and other biological processes (Ihsan, 2019).

#### **4.3.2 Self Life**

Potato spread is included in the wet food category; therefore, to maintain the quality of the potato spread, it must be carefully estimated, because wet food will stale more easily. This is because of the liquid or water content contained in the composition of the ingredients used, which makes food stale quickly. Bacteria and fungi can grow quickly in the presence of water. With the existence of research, water is a common cause of facilitating disposal, so when making potato spread, minimizing the use of water is carried out. Water was used only when steaming the potatoes. Instead, the liquid was replaced with Roux, a mixture of fat from margarine and cornstarch.

After the trial period, it has been tested for more than 2 weeks there is no significant change, the taste is the same, the aroma, the color, it is just that the texture may be denser because the low temperature makes the texture denser but after stirring the texture returns to normal. This product is better not to be consumed more than 1.5 months after the date of manufacture because potato spread is wet food, make sure it is always put in the refrigerator and cannot be exposed to outdoor temperature for too long

### **4.3.3 Product Packaging**

Packaging has a big impact on the product. In fact, packaging does not only function to protect the product, but also influences consumer decisions in buying a product. The form of packaging is able to accommodate and protect the contents when distributed. Besides that, packaging also functions as a marketing tool because packaging can be an attraction that can increase sales of a product (Subadmin, 2020).

Potato spread is a ready-to-eat food, which can be consumed as breakfast, lunch, or as a sauce. Usually eaten with bread or crackers like jam in general. This potato spread does not have to be consumed at warm temperatures, it can also be consumed at cold temperatures, depending on each consumer. Glass is an impermeable material that keeps air and other liquids out, which means that glass bottles never affect the product's flavor or freshness. Additionally, external temperatures, such as heat, do not affect the material or shape of the glass, unlike plastics that could melt and affect the product quality. Therefore, food and beverage products remain extremely fresh when packaged in glass. Glass bottles also help the packaging's internal temperature stay the same, so products do not spoil easily.

Glass is one of the safest materials you can use for consumable products such as spreads like potato spread. It is nontoxic and does not require any lining of other materials. Recognized as Generally Recognized as Safe (GRAS) by the FDA, and being the only widely used food packaging material, proves why

glass is a great choice for food and beverage manufacturers. Glass has been, and will always be, considered premium quality. The shelf life of a glass bottle extends for years, and its color never fades. Glass bottles are transparent and can show off your product. Utilizing various glass colors can also incorporate your brand's colors and/or overall identity.

Glass bottles that are made from 100% natural sustainable raw materials, which are infinitely recyclable. Using glass helps reduce additional waste, which is an ideal benefit of all product packaging since recycling is becoming an even bigger topic and action for many consumers. This is particularly true for glass bottles which on average have a recycling rate varying from 50-80%. As a result from glass recycling, significant amounts of raw materials are saved and natural resources are preserved. Technically, potato spread uses a jar with a total weight for 350 gr, body diameter: 7cm, mouth diameter: 5cm, and height: 12.5cm.



**Figure 4.3** Glass jar 350gr

As good as they are, glass jars are not extremely expensive to get hands on. Glass is a relatively cheap material and glass jars follow suit. While items such as disposable cans or plastic containers can sometimes prove cheaper, glass jars do not set back much (Torres, 2021). Glass packaging can withstand both cold and hot temperatures without altering its chemical composition. For pharmaceutical purposes, for example, glass can be quickly sterilized and exposed to high temperatures without denaturing and killing bacteria and germs. The temperature resistance of glass ensures that food products are stored, used, or consumed under the appropriate conditions. Glass helps to preserve the nutritional value of the contents by acting as a natural barrier against potentially harmful bacteria. In addition, glass is a robust material that does not deteriorate, corrode, stain, or fade, preventing the transfer of undesirable flavors from packaging into food and beverages, and keeping their nutritional value intact.

Glass is the safest packaging material for safeguarding people's health. Personal health and food safety are among the top consumer concerns. Before use, glass bottles are sterilized by boiling glass bottles in boiling water, by immersing glass bottles for 10-15 minutes and then rinsing with water. Then the potato spread is put in and the second sterilization is carried out in the same way by boiling a glass bottle in hot water for a short time of about 3-5 minutes. This sterilization is very important to keep glass bottles clean from germs and can also make food last longer.





Figure 4.4 Label on the glass jar



Figure 4.5 Sticker Label

## 4.4 Financial Aspects

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

The costs listed are based on the total cost per month including additional labour costs, raw material costs, packaging, and utility costs. Labour cost, utility cost, and packaging cost are listed based on working days per month of 26 days, with production per day making 35 jars equivalent to 35 recipes per day, which are 910 jars per month. 1 recipe will produce 1 jar of potato spread. The quantity of raw materials is counted as 35 recipes per day.

1. Start-Up Capital

*Table 4.3 Start-Up Capital*

<b>Tools &amp; Equipment</b>	<b>Quantity</b>	<b>Price/unit</b>	<b>Sub Total</b>
Blender	1	Rp 450,000	Rp 450,000
Spoon	5	Rp 2,500	Rp 12,500
Steamer pot	1	Rp 150,000	Rp 150,000
Spatula silicon	2	Rp15,000	Rp 30,000
Large bowl	3	Rp 15,000	Rp 45,000
Small bowl	3	Rp 7,000	Rp 21,000
Digital scale	1	Rp 40,000	Rp 40,000
Cutting board	1	Rp 55,000	Rp 55,000
Pan	1	Rp 229,000	Rp 229,000
Knife	1	Rp 50,000	Rp 50,000
Peeler	1	Rp 46,000	Rp 46,000
<b>TOTAL</b>			<b>Rp 1,128,500</b>

2. Labour Cost

*Table 4.4 Labour Cost*

<b>Occupation</b>	<b>Personnel</b>	<b>Salary/month</b>	<b>Sub Total</b>
Chef	1	Rp 4,500,000	Rp 4,500,000
Administration officer	1	Rp 3,000,000	Rp 3,000,000
Cleaning service officer	1	Rp 2,400,000	Rp 2,400,000
<b>TOTAL</b>			<b>Rp 9,900,000</b>

### 3. Packaging Cost

*Table 4.5 Packaging Cost*

Packaging	Quantity	Price/unit	Sub Total
Glass jar	35	Rp 2,300	Rp 80,500
Sticker label	35	Rp 14,000/20 pcs	Rp 24,500
<b>TOTAL/day</b>			<b>Rp 105,000</b>
<b>TOTAL/month</b>			<b>Rp 2,730,000</b>

### 4. Utility Cost

*Table 4.6 Utility Cost*

Facility	Quantity	Price/unit	Sub Total
Water	400L	Rp 2,000 (/m3)	Rp 1,200
Gas	1 kg	Rp 12.000/kg	Rp 12,000
Electricity	10 kWh	Rp 1,500 (/kWh)	Rp 15,000
<b>TOTAL/day</b>			<b>Rp 28,200</b>
<b>TOTAL/month</b>			<b>Rp 733,200</b>

### 5. Raw Material Cost

*Table 4.7 Raw Material Cost*

Tools & Equipment	Quantity	Price/unit	Sub Total
Potato	70 pcs	Rp 17,000/6pcs	Rp 198,400
Corn starch	350 gr	Rp 16,000/1kg	Rp 5,600
Margarine	875 gr	Rp 10,500/200gr	Rp 46,000
Nutmeg	35 gr	Rp 19,500/50gr	Rp 13,650
Paprika powder	105 gr	Rp 34,800/500gr	Rp 7,308
Garlic powder	105 gr	Rp 85,000/1kg	Rp 8,925
Onion flakes	140 gr	Rp 255,000/1kg	Rp 35,700
Mustard	245 gr	Rp 193,000/2,97kg	Rp 15,920

Salt	175 gr	Rp 6,650/500gr	Rp 2,327
Sugar	175 gr	Rp 8,500/500gr	Rp 2,975
Black pepper	70 gr	Rp 77,000/1kg	Rp 5,390
Oregano	70 gr	Rp 17,000/100gr	Rp 11,900
<b>TOTAL/day</b>			<b>Rp 354,095</b>
<b>TOTAL/month</b>			<b>Rp 9,206,470</b>

#### 7. Total Cost

Fixed Cost = Labour Cost

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

$$\begin{aligned}
 \text{Total Cost (/month)} &= \text{Labour} + \text{Raw Material} + \text{Packaging} + \text{Utility} \\
 &= 9,900,000 + 9,206,470 + 2,730,000 + 733,200 \\
 &= \underline{\underline{\text{Rp 22,569,670}}}
 \end{aligned}$$

#### 4.4.2 Selling Price

$$\begin{aligned}
 \text{Product Price} &= \frac{\text{total cost (/month)}}{\text{total product units (/month)}} \\
 &= \frac{22,569,760}{910} \\
 &= \underline{\underline{\text{Rp 24,831.6 / jar}}}
 \end{aligned}$$

$$\begin{aligned}
 \text{Product Selling Price} &= \text{Product price} + (\text{product price} \times \text{profit percentage}) \\
 &= 24,832 + (24,832 \times 35\%) \\
 &= 24,832 + 8,726.2 \\
 &= \text{Rp 33,558.2} \approx \underline{\underline{\text{Rp 34,000 each 1 jar}}}
 \end{aligned}$$