CHAPTER IV
RESULT AND DISCUSSION

4.1 Product Result

The nutritional content of jam consisting of apple peels and banana peels can vary depending on the type of ingredients used. The nutritional value of a large apple peel consists of 12 Kcal calories, 3.2 g carbohydrates, 0.1 g fat, 239 mg potassium, 120 IU vitamin A, 10 mg Vitamin C. (Ikhsania, 2020). While the banana peel consists of 146 Kcal calories, 50 grams of carbohydrates, 2.11 g of fat, 0.32 g of protein, 715 mg of calcium, 117 mg of phosphorus, 1.6 mg of iron, 0.12 mg of vitamin B, 17.5 mg of vitamin C, 68.9 mg of minerals. (Salim, 2022).

Apple peels and banana peels are waste from the utilization of the fruit flesh, of course this is very unfortunate considering the nutritional value contained in these two fruit peels. Apple peels and banana peels both contain flavanoid compounds which function to ward off free radicals in the body. Free radicals can cause various types of chronic diseases such as arthritis, heart disease, atherosclerosis, stroke, hypertension, etc. Antioxidants work to neutralize the damaging properties of free radicals so that they can prevent these diseases (Indra, 2019). In addition, the nutritional content in apple peels and banana peels also acts as a source of energy, supports or maximizes metabolism and other organs in the body (Baladewa, 2022).

4.2 Nutrition Fact

4.2.1 Nutrition Table

Table 4. 1 The Nutritional Value of Appel Skin per 100 g

Calori (Kcal)	25.2
Carbohydrate (g)	6.72
Fat (g)	0.21
Potassium (mg)	501.9
Vitamin A(IU)	252
Vitamin C (mg)	21
Fiber	5.46

Source: Ikhsania, 2020; Garcia, 2021

Table 4. 2 The Nutritional Value of Banana Skin per 100 g

Calori (Kcal)	146
Carbohydrate (g)	50
Fat (g)	2.11
Protein (g)	0.32
Calcium (mg)	715
Phosphorus (mg)	117
Iron (mg)	1.6
Vitamin B (mg)	0.12
Vitamin C (mg)	17.5
Moisture (g)	68.9
Fiber (g)	50

Source: Salim, 2020; Nasriati, 2021; Setyaningrum, 2019

From the nutritional value table above, we know that jam made from apple peels and banana peels contains 5 essential nutrients for the body, namely carbohydrates, protein, fat, vitamins and minerals. Apart from these 5 nutrients, this fruit skin jam also contains calcium, phosphorus, iron and fiber.

4.2.2 Nutrition Calculation

Table 4. 3 Nutritional Value of Ingredients used in Jam from Apple Peels and Banana Peels

Ingredients	Calories (kcal)	Carbohydrate (g)	Protein (g)	Fat (g)	Sugar (g)	Fiber (g)	Sodium (mg/100g)
Apple peel (100 g)	25.2	6.72	-	0.21	-	5.46	-
Banana Peel (100 g)	146	50	0.32	2.11	-	50	-
Sugar (100 g)	386.7	100	-	-	100	-	1
Cinamon (2 g)	4.95	1.62	0.08	0.024	0.044	1.06	0.2
Clove (0.5 g)	0.005	0.33	0.03	0.065	-	0.05	1.41
Pectin (5 g)	16.25	4.5	0.015	0.015	-	0.43	10
Lemon (60 ml)	17.34	5.4	0.66	0.18	1.5	1.68	1.2
Salt (10 g)	-	-	-	-	-	-	3,875
Water (1080 ml)	-	-	-	-	-	-	-
Total	596.445	168.57	1.105	2.604	101.544	58.68	3,888.81

4.2.3 Nutrition Label

Nutrition Facts

11 Servings per container

Serving Size	**15 g**
Amount Per Serving	
Calories	**50**
	% Daily Value*
Total Fat 0 g	**0%**
Saturated Fat 0 g	**0%**
Trans Fat 0 g	
Sodium 340 mg	**15%**
Total Carbohydrate 15 g	**5 %**
Dietary Fiber 5 g	**18 %**
Sugars 9 g	
Protein 0 g	**0 %**
Calcium 63 mg	**4 %**
Vitamin C 3 mg	**4 %**

Not a significant source of Potassium, iron, phosphorus, vitamin A and vitamin B

*The % Daily Value (DV) tell 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.

Figure 4. 1 Nutrition Fact of Jam from Apple Peels and Banana Peels

4.3 Food Safety and Packaging

4.3.1 Processing and Storage Temperature

Processing of jam from apple peels and banana peels will go through several methods that are weighing, washing, soaking, blending, mixing and cooking. At the weighing method, the amount of apple peels and banana peels will be weighed according to the recipe. next is the washing method, at this stage the two fruit skins will be washed with running water until they are clean because washing the fruit skin can remove dirt and pesticide residues up to 70-99% on the fruit skin (Haryati, 2020).

Next is soaking method, at this method two fruit skins will be soaked separately in water with lemon juice and salt for 30 minutes, the aim is destroying the remaining germs, bacteria and pesticides that are still attached (Wibowo, 2018). Next blending, in this method the two fruit skins will be blended separately to become fruit pulp. Next method is mixing, the two fruit peel pulps will be mixed with added sugar and spices. The last is cooking method, in this method the fruit peel pulp

which has been mixed with sugar and spices will be cooked until thickened with an average temperature of 103 - 106 degrees Celsius.

Fruit peel jam (appel peel and banana peel) should be stored at a refrigerator temperature between 1.7 - 3.3 degrees Celsius in order to increase the shelf life of the product.

4.3.2 Shelf Life

Fruit peel jam is a processed product that has a natural preservative, which is sugar. So, this jam product can last at room temperature between 20 - 25 degrees Celsius for 5 days and refrigerator temperature between 1.7 - 3.3 degrees Celsius for 3 weeks. Signs of deterioration when the fruit skin jam has passed its expiration date include an unpleasant odor and becomes runny.

4.3.3 Product Packaging

Product packaging is a container or wrapper that has a function to prevent or minimize damage to the packaged product. In addition to protecting the product, packaging also plays a role in product preservation and product marketing (Widiastuti, 2022).

Jam from apple peels and banana peels will use glass packaging because glass packaging has advantages for jam products such as heat resistance, non-reactivity, Enables Heat Transmission, Premium and Attractive Appearance and Increases Shelf Life (Nurhayati, 2021).

Jam products require packaging that can withstand heat from the outside so that the temperature of the jam inside the package remains stable, not reactive to acids so as not to change the taste and quality, also allows heat transmission to ensure the taste and aroma of the jam does not change. Therefore, glass packaging was chosen as the packaging for this jam product. Glass packaging also has a premium and attractive appearance and can increase shelf life because glass packaging is

equipped with an airtight metal lid along with a gas barrier property, which does not allow interaction between jam and air or moisture (Nurhayati, 2021).

The hexagonal glass jar was chosen because it is easier and more practical to use for jam products than other glass jar shapes. The hexagonal glass jar used has dimensions of 5.2 cm x 8 cm (100 ml). For product distribution, tertiary packaging will be used in the form of cardboard with a size of 21 cm x 11 cm x 8 cm.

Figure 4. 2 Hexagonal glass jar 100 ml

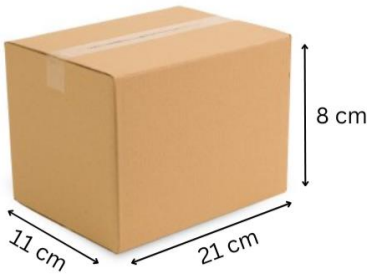

Figure 4. 3 Cardboard 21 cm x 11 cm x 8 cm

In addition, the packaging must also contain a food label. For producers, labels are a means of communicating with consumers. Through labels, producers can provide information, offer, promote their products in such a way as to appeal to consumers. Meanwhile for consumers, it is important to pay attention, read, understand the information on the labels listed on the packaging so that the products we

buy are according to our wishes. (Ansori, 2020). The labels for jam made from apple peels and banana peels contain information; such as product name, product superiority, composition, nutrition facts table, and contact lists.

Figure 4. 4 Logo

4.4 Financial Aspects

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

In opening a business, start-up capital is needed to buy equipment or utensil and production costs are calculated per month, which are 26 days per month. Costs that need to be paid per month such as labor costs, raw material costs, packaging costs, and utility costs. labor costs will be calculated per month while for raw materials, in one day it will produce 7 full box or 56 jars which is 56 portions.

1. Start-up Capital

Table 4. 4 Start-up capital

Equipment and Utensil	Quantity	Price (/unit)	Sub Total
Sauce pan	2	Rp 150,000	Rp 300,000
Stove	2	Rp 200,000	Rp 400,000
Blender	2	Rp 300,000	Rp 600,000
Knive	2	Rp 60,000	Rp 120,000
Wooden spatula	2	Rp 4,000	Rp 8,000
Cutting board	2	Rp 10,000	Rp 20,000
Large bowl	4	Rp 26,000	Rp 104,000
Bowl	2	Rp 8,000	Rp 16,000
Tea spoon	2	Rp 10,000	Rp 20,000
Digital Scales	2	Rp 56,000	Rp 116,000
	TOTAL		**Rp 1,704,000**

2. Labour Cost

Table 4. 5 Labour Cost

Occupation	Personnel	Salary (/month)	Sub total
Cook helper and administration officer	1	Rp 5,000,000	Rp 5,000,000
cleaner and courier officer	1	Rp 5,000,000	Rp 5,000,000
	TOTAL		**Rp 10,000,000**

3. Packaging Cost

Table 4. 6 Packaging Cost

Packaging	Quantity	Price (/unit)	Sub total
Hexagonal glass jar	56 pcs	Rp 2,000	Rp 112,000
Cardboard	7 pcs	Rp 500	Rp 3,500
Label	56 pcs	Rp 500	Rp 28,000
	TOTAL (/day)		**Rp 143,500**
	TOTAL (/month)		**Rp 3,731,000**

4. Utility Cost

Table 4. 7 Utility Cost

Facility	Quantity	Price (/unit)	Sub total
Water	750 L	Rp 2,000 (/m3)	Rp 1,500
Electricity	10 kWh	Rp 1,500 (/kWh)	Rp 15,000
	TOTAL (/day)		**Rp 16,500**
	TOTAL (/month)		**Rp 429,000**

5. Raw Material Cost

Table 4. 8 Raw Material Cost

Raw Materials	Quantity	Price (/unit)	Sub total
Apple peel	5.6 kg	Rp 3,000 (/kg)	Rp 16,800
Banana peel	5.6 kg	Rp 2,000 (/kg)	Rp 11,200
Sugar	5.6 kg	Rp 15,000 (/kg)	Rp 84,000
Cinnamon	112 g	Rp 8,000 (/100g)	Rp 8,960
Clove	28 g	Rp 12,000 (/100g)	Rp 3,360
Pectin	280 g	Rp 25,000 (/100g)	Rp 70,000
Lemon	56 pcs	Rp 1,500 (/pc)	Rp 84,000
Salt	560 g	Rp 7,500 (/kg)	Rp 4,200
Water	60.5 L	Rp 8,000 (/19L)	Rp 25,500
Gas (12 kg)	1 kg	Rp 20,000 (/kg)	Rp 20,000
TOTAL (/day)			**Rp 328,020**
TOTAL (/month)			**Rp 8,528,520**

6. Advertisement Cost

Table 4. 9 Advertisement Cost

Facility	Quantity	Price	Sub total
Advertisement on social media	30 days	Rp 50,000 (/day)	Rp 1,500,000
	TOTAL		**Rp 1,500,000**

7. Total Cost

Fixed cost = labour cost and advertisement cost

Variable cost = raw material cost, packaging cost and utility cost

Total cost (/month) = labour + raw material + packaging + Utility + advertisement

Rp 10,000,000 + Rp 8,528,520 + Rp 3,731,000 + Rp 429,000 + Rp 1,500,000

= Rp 24,188,150

4.4.2 Selling Price

Product price $= \frac{Total\ cost\ (month)}{Total\ product\ unit\ (month)}$

$= \frac{Rp\ 24{,}188{,}520}{1{,}456}$

= Rp 16,700 / portion

Product selling price = Product price + (product price x profit percentage)

= Rp 16,700 + (Rp 16,700 x 50%)

= Rp 16,700 + 8,350

= Rp 25,050

= Rp 25,500