

## **CHAPTER IV**

### **RESULT AND DISCUSSION**

#### **4.1. PRODUCT RESULT**

Candy is a food that is much liked by children and adults. Currently there are lots of sweet foods circulating in society, namely Gummy candy. But most of the sweets on the market are only concerned with taste and appearance without worrying about benefit and health issue, so it needs to be developed, so that sweets can benefit the body, for example by using carrot juice. Result of research and statistical tests general indicate that the amount of fresh vegetable more and more added the resulting water content increases. The water content in carrot is quite high i.e. 21 g per 100 g of carrot. Because is affect the quality of candy is water content, therefore water content is very related to shelf life from the candy it contains. The more amount of vegetable added carrot then the water content of the candy will increase. The highest ash content is found of 2,721% and the lowest of 1.566%. More meat added carrot, the ash content will be produced high. Because of the carrot contain lots of minerals and vitamin A. Determination the quality of the candy is affected by the content ash, where the ash content itself is very influence in the process of candy processing The candy is produced to meet quality requirements soft candy, (Nurwati, 2011).

Gummy candy water content water in the study this ranged from 9.16%-12,84%. The resulting water Gummy candy has meet the Gummy candy quality standarts, which is a maximum of 20%. Observations made on the water content of Gummy candy shows a decrease ginger extract concentration, this is due to more and more the addition ginger liquid in the candy. Gummy can bind water contained in the Gummy candy material. Moisture content of a product determined by the moisture content of the raw material and support used, in addition, also affected by the processing. (Subaryono and Utomo, 2006) states that the water content Gummy candy is determined by duration of cooked and drying on Gummy candy product.

According to (Rismandari, 2017) water content high Gummy candy due to substances in material contains too much water or dissolved solids are too low, so the consistency of the gel formation is too little ensure that the network does not hold to liquid sugar, which produces Gummy candy and generate levels sinnersis and height, (Atmini, 2010). From water content is too high, will reduce product durability, because it's easy to get damaged by microbes. Also Gummy candy usually contain no nutrients and vitamin in that so , using moringa leaf powder and spinach water give a lot of nutrition and vitamin because moringa contains more iron, manganese, vitamin C, thiamin, riboflavin, niacin and vitamin B6. However, spinach contain carotenoids, folate, magnesium and potassium.

Data to the texture shows the higher the concentration of gelatin the more product hardness. According to (Rahman, 2012), if the concentration of gelatin is too low, the gel become soft, but when concentration of gelatin used is too high it will be stiff. Texture is a sensation of pressure can be felt by mouth or by touch with fingers (Kurniawan, 2006), texture is an important parameter in food soft.

In that case my product result have been completely success and just need little bit adjustment and check some of trial an error and its been done. The Gummy candy product had contain 15%- 20% of my water content so wthich is a good thing because gummy candy only have water contain of 12%-20%.

## **4.2. NUTRITION FACT**

### **4.2.1. Nutrition Table**

The nutritional value of Gummy Candy from Moringa leaf powder and Spices is as follows:

**Table 4. 1** Nutrition value of dates per 100 g

Calorie (cal)	277
Protein (g)	2
Carbohydrate (g)	75
Fiber (g)	7
Ash (g)	3.43
Moisture (g)	22.8
Total Sugars (g)	74.3
Lipid (g)	0.47

Source: Shafiei et al, 2020, Eltayeb et al, 2020






The water content indirectly proportional to the sugar content, so with low water content way to contain high sugar and vice versa. Varieties of contain about 70% reducing sugars with nearly equal amounts of glucose and sugar fructose. The most important commercial characteristics of dates are based on at a significant sugar content both for fresh consumption an for fruit processing.

#### 4.2.2. Nutrition Calculation

Nutritional Value of ingredients used in the recipe for Gummy Candy from Date juices and spices liquid:

<b>Ingredients</b>	<b>Calories (cal)</b>	<b>Carbohydrate (g)</b>	<b>Protein (g)</b>	<b>Fat (g)</b>	<b>Sugar (g)</b>	<b>Fiber (g)</b>	<b>Sodium mg/100 g</b>
<b>Dates</b>	277	75	2		74.3	7	7.5
<b>Almond</b>	165	6	6	14	6	3	0.1
<b>Ginger</b>	79,6	18	1.8	0.8	1.7	2	3
<b>Moringa Powder</b>	40	66.67	33.3	3.3	1.9	33,3	20
<b>Spinach Powder</b>	50	16.4	31.1	3.87	2.3	24.26	55
<b>Carrot Juices</b>	80	17	2	0	10	2	0.2
<b>Soymilk</b>	54	4.92	2.6	1.8	3.65	0.2	0.4
<b>Gelatine</b>	61,7	1.4	1.2		13		75
<b>Total</b>	<b>807,3</b>	<b>205,4</b>	<b>80</b>	<b>23.7</b>	<b>112,8</b>	<b>71,7</b>	<b>161,2</b>

### 4.2.3. Nutrition Label

<b>Nutrition Facts</b>	
About 1 Serving Per Container	
<b>Serving Size</b>	<b>500g</b>
<b>Amount Per Serving</b>	
<b>Calories</b>	
<b>% Daily Value *</b>	
<b>Total Fat</b> 	
Saturated Fat 0g	<b>2%</b>
<i>Trans Fat</i> 0g	
<b>Cholesterol</b> 0mg	<b>0%</b>
<b>Sodium</b> 250mg	<b>10%</b>
<b>Total Carbohydrates</b> 	
Dietary Fiber 11g	<b>39%</b>
Total Sugars 90g	
Includes 0g Added Sugars	<b>0%</b>
<b>Protein</b> 61g	
Vitamin D 1.0mcg	6%
Calcium 240mg	20%
Iron 3.0mg	15%
Potassium 1340mg	30%
* 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.	

## 4.3. FOOD SAFETY AND PACKAGING

### 4.3.1. Processing and storage temperature

Gummy candy is best stored at temperature in a cool place. Store the Gummy candy at room temperature, which is around 20-25 C. Avoid direct exposure to sunlight or heat sources that could cause the candy to melt. And if it is placed in a cool place it can retain the taste of candy and oxidation from the air can't get in and spoil the taste of the gummy candy

(Sharif et al, 1989). Gummy candy is susceptible to moisture, which can make it soggy or spoil. Make sure to store it in a dry place and away from sources of moisture such as kitchen or bathroom. Increase in the value of water content caused by the increased speed respiration and formation of free water on the material by microbes during storage. In addition, various reactions that occur during storage such as fat oxidation, which produces water vapor, as well biochemical and microbiological reactions that take place during the process storage. Increment difference influenced by type and storage characteristic used, because it will affect the movement of water vapor formed (Kasmadiharja, 2008). Avoid contamination and make sure the storage container and surrounding area are clean before storing the gummy candy. Keep away from ingredients with strong or pungent odors, which can spoil the taste and texture of the candy, (Purnomo, 1995), texture is a group of

physical properties caused by structural elements of foodstuffs that can be felt by the touch, related to the deformation and disintegration of the food measured organoleptically by eye, time, and distance.

#### **4.3.2. Shelf Life**

Gummy candy that are stored in an airtight container, in a cool place such as chiller, and protected from exposure to direct sunlight can last for 2 months. Gummy candy with exposed container gives significant effect on aroma value, then got show aroma value of gummy candy during storage room temperature decreased quality organoleptically. Change and organoleptically quality loss on gummy candy products from the aroma temperature storage and avoid exposure to sunlight. This is presumably due to its translucent nature light, (Kataren, 2005), light is an accelerator against rancidity a combination of oxygen and light can speed up the oxidation process. In addition to the decrease in aroma value.

#### **4.3.3 Product Packaging**

When choosing a packaging to store gummy candy, make sure the container is clean and free from odors or other contaminants that can affect the taste of gummy candy. In addition, the long storage time of the product, food also affects the quality of the product, where the longer the product is stored, then the rate of decline in the quality of food products will also increase, (Danarsi, & Noer, 2016). And must stabilize the temperature on the gummy candy it doesn't melt. The higher higher temperature storage, the rate of reaction of various chemical compounds will also increase. By therefore, The temperature factor must always be taken into account in estimating the rate of deterioration food during storage, (Syarief ,1998).

Choosing a glass jar as a gummy candy can help prevent air from entering, keeping the gummy candy fresh for a longer period of time, can protect the product from the chemical influences such as rapid changes in composition, the biological influences such as being able to resist pathogenic microorganism or agents spoilage, as well as physical protecting products from mechanical an other hazard, (Marsh & Betty, 2007), this keeps the gummy candy fresh and avoids unwanted contamination. Glass jars are usually transparent, which allows easy viewing of the contents and condition of the gummy without having to remove the lid. This helps you monitor the quality of the gummy without opening and disturbing storage. The glass does not contain harmful materials that can leak into the gummy candy. As a safe material for food contact, glass jars provide additional confidence in the safety of gummy candy storage.



**Figure 4. 1 Jar Glass 100 ml**



**Figure 4. 2 Log**

## 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 production will be 5 recipe per day or 10 packs, the working days will be 20 days per month. Therefore the production will be 100 recipes or 200 packs per month.



### 1. Start-Up Capital

**Table 4. 2** Start up capital

<b>Tools and Equipment</b>	<b>Quantity</b>	<b>Price (/unit)</b>	<b>Sub Total</b>
Pot 500 Ml	1	Rp. 250.000,00	Rp. 250.000,00
Knife	1	Rp. 250.000,00	Rp. 250.000,00
Scales	1	Rp. 100.000,00	Rp. 100.000,00
<b>TOTAL</b>			<b>Rp. 600.000,00</b>

### 2. Packaging Cost

**Table 4. 3** Packaging Cost

<b>Packaging</b>	<b>Quantity</b>	<b>Price (/unit)</b>	<b>Sub Total</b>
Glass Jar 100 ml	10	Rp.3.850,00	Rp. 38.500,00
Sticker Logo	10	Rp. 450,00	Rp. 4.500,00
Sticker Label	10	Rp. 300,00	Rp. 3,000,00
<b>TOTAL (/day)</b>			<b>Rp. 46.000,00</b>
<b>TOTAL (/month)</b>			<b>Rp. 920.000,00</b>

### 3. Utility Cost

**Table 4. 4** Utility Cost

<b>Facility</b>	<b>Quantity</b>	<b>Price (/unit)</b>	<b>Sub Total</b>
Water	4 m <sup>3</sup>	Rp 2.100,00/ m <sup>3</sup>	Rp. 8.400,00
Gas	170 gr	Rp. 190.000,00/3 Kg	Rp. 10.760,00
<b>TOTAL (/day)</b>			Rp. 19.166,00
<b>TOTAL (/month)</b>			Rp.388.320,00

## 4. Raw Material Cost

**Table 4. 5** Raw Material Cost

<b>Ingredients</b>	<b>Quantity</b>	<b>Price (/unit)</b>	<b>Sub Total</b>
Dates	162 gr	Rp 175.000,00 /kg	Rp. 28.435,00
Water	3125 ml	Rp.19.000,00/19L	Rp. 3.125,00
Ginger	20 gr	Rp. 16.500,00/ kg	Rp. 330,00
Moringa powder	20 gr	Rp. 68.000,00/kg	Rp. 1.360,00
Spinach powder	20 gr	Rp. 68.000,00/kg	Rp. 1.360,00
Carrot	100 gr	Rp. 20.000,00/kg	Rp. 2.000,00
Soymilk	100 ml	Rp. 35.000,00/l	Rp. 3.500,00
Gelatine	300 gr	Rp. 25.000,00/ 70 gr	Rp. 107.143,00
<b>TOTAL (/Day)</b>			Rp. 143.753,00
<b>TOTAL (/Month)</b>			Rp. 4.312.590,00

#### 5. Total cost

Variable Cost = Raw Material, Packaging, Utility Cost

Total Cost (/month) = Raw Material + Packaging + Utility  
Rp.4.312.590,00+Rp.920.000,00+ Rp.  
388.320,00  
= Rp. 5.620.910,00

#### 4.4.2 Selling Price

Product Price =  $\frac{\text{Total Cost (/month)}}{\text{Total Product Units (/month)}}$   
=  $\frac{\text{Rp. 5.620.910,00}}{200}$   
= Rp. 28.104.00

Product Selling Price = Product Price + ( product price × profit  
percentage)  
= Rp. 28.104+ ( Rp28.104× 50%)  
= Rp. 28.104+ Rp. 14.052  
= Rp 42.156 / Jar  
= Rp.42.200,00/ Jar