

Utilization of Moringa Leaf Powder as a Jelly Candy Flavor

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ABSTRACT

This study aims to determine and describe how the results of the organoleptic test of moringa leaves as jelly candy flavor. Candy in general is a product made by boiling a mixture of sugar and additives that can maintain its shape for a long time with coloring and flavoring agents which are then molded into the desired shape. The data analysis technique used in this study is a qualitative descriptive analysis technique to determine the benefits of moringa leaf powder as a jelly candy flavor, in terms of taste, texture, color and aroma. Based on the organoleptic test conducted by 20 panelists, the taste of the jelly candy received a good interpretation criterion of 79%, and most of the panelists stated that the taste of jelly candy with moringa leaf powder flavor is sweet and has a distinctive taste of moringa. The utilization of moringa leaf powder as jelly candy flavor is good, because it gets a good total interpretation criterion, which is 67%.

Keywords : *Moringa Leaf Powder; Jelly Candy Flavor; Organoleptic Test*

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1. Introduction

industry is of course also followed by the development and provision of safe food for tourists to enjoy while on vacation. Along with developments in the tourism industry in Indonesia, especially in the food and beverage industry, of course, culinary service actors manufacturers in Indonesia are required to be more creative in h creating innovations in the culinary world such as processing food into sweets, pickles, salads, sweets, dodol, to jams or, marmalade which of course also has high nutrition. In Indonesia, there are various kinds of plants that contain many benefits for health and very nutritious for food ingredients, one of which is the moringa plant (*Moringa Oeifera*) (Rahmawati, 2016).

Moringa (*Moringa oleifera*) is a shrub with a height of 7-11 meters and thrives from the lowlands of 0 to an altitude of 700 meters above sea level. Moringa can grow in tropical and subtropical areas on all types of soil and is resistant to drought for up to 6 months (Thomas, 2007). One of the benefits that can be taken from the moringa plant is the leaves.

Moringa leaf is one part of the moringa plant that has been widely studied for its nutritional content and uses. Moringa leaves are very rich in nutrients, including calcium, iron, phosphorus, potassium, zinc, protein, vitamin A, vitamin B, vitamin C, vitamin D, vitamin E, vitamin K, folic acid and biotin (Syarifah et al, 2015). Dried moringa leaf is more nutritious than fresh moringa leaves. This is because, processing fresh moringa leaves into dried moringa leaves increasing the concentration of all nutrients except vitamin C.

Besides being consumed directly in fresh form, moringa leaves can also be processed into flour or powder which can be used as a fortification material to provide nutrients for various food products, such as pudding, cake, nuggets, biscuits, crackers and other preparations. Moringa leaf flour can be added to any type of food as a nutritional

supplement (Prajapati, et al. 2003).

One of the snacks favored by all age groups, especially children, is jelly candy. Jelly candy is popular because it has a sweet taste and unique texture. In addition, jelly candy can also be processed in many variations ranging from colors, flavors, raw materials and shapes. By formulating Moringa leaf powder into the jelly candy formula, the nutritional value contained in the jelly candy will increase. In addition, the presence of moringa jelly candy can later increase the use of moringa leaves as a functional food that can be accepted by various circles of society, especially children (Rahmawati, 2016).

Several previous studies used additional formulations of Moringa leaves into food products to increase their nutritional value such as biscuits (Kholis & Hadi, 2010), soy meatballs (Evivie,et al., 2015), yogurt (Diantoro, et al., 2015) and jelly drink products (Yulianti, 2008).

2. Literature Review

2.1 Moringa Plant (*Moringa oleifera*)

Moringa oleifera is one type of plant that grows and develops in tropical areas such as Indonesia. All parts of the moringa plant have nutritional value that is ~~efficacious~~ beneficial for health and profitable in the industrial sector. Moringa has a high antioxidant and antimicrobial content that function as a natural preservative and extends the shelf life of raw materials (Aminah et al., 2015).

Moringa plants have benefits including:

a) As food

Moringa plants have benefits as food ingredients that are used to overcome malnutrition, especially for toddlers and breastfeeding mothers. Processing moringa leaves into flour will increase the calorific value, iron, calcium, protein, and vitamin A. This is because during the processing of moringa leaves into flour

there will be a reduction in the water content contained in Moringa leaves (Dewi *et al.*, 2016).

b) Health

The health benefits contained in moringa leaves are for weight loss, anti-diabetes, and prevent heart disease.

c) Environment

Moringa plants can be used as reforestation plants around the house, land borders or fields because moringa plants are drought tolerant in addition to being used as vegetable or animal feed ingredients.

2.2 Moringa Leaves

Moringa leaves are the part that has many benefits. In general, moringa leaves can be consumed because they have high nutrition and protein. Moringa leaves can be made into powder for food ingredient. Not only that, Moringa leaves that are dried into powder have more nutritional content than when this plant is in the form of raw leaves (Rahmawati, 2016).

Moringa leaves that are dried and then made in powder form have more nutritional content than fresh moringa leaves. The comparison of the nutritional content of fresh and dried moringa leaves is shown in Table 1 below (Angelina, 2021).

Table 1. Nutritional Content of Fresh Moringa Leaves and Dried Moringa Leaves (per 100g)

Nutrient content	Fresh Moringa Leaves	Dried Moringa Leaves	Reference
Water content (%)	75.9	6	
Ash content	-	7.95	Shiriki, <i>et al.</i> (2015)
Calories (cal)	92	205	
Proteins (%)	6.7	23.78	Augustyn, <i>et al.</i> (2017)
Fat (%)	4.65	2.74	
Carbohydrates (%)	12.5	51.66	Tekle, <i>et al.</i> (2015)
Fiber (%)	7.92	12.63	Aminah, <i>et al.</i> (2015)
Calcium (mg)	440	2003	
Calcium (mg)	259	1324	
Iron (mg)	0.85	28.2	
Magnesium (mg)	42	368	
Zinc (mg)	0.16	3.29	
Phosphorus (mg)	70	204	USDA National Nutrient Database (2015)
Copper (mg)	0.07	0.57	
Vitamin A (mg)	6.78	18.9	
Niacin (B3) (mg)	0.8	8.2	
Riboflavin (B2) (mg)	0.05	20.5	
Thiamine (B1) (mg)	0.06	2.64	
Vitamin C (mg)	220	17.3	

2.3 Jelly Candy

Candy is a high-calorie food that is generally made from sugar, water and fructose syrup. High sugar content in sweets can cause cavities (BSN, 2004).

Jelly candy is a type of candy that has a soft texture which is processed with the addition of hydrocolloid components such as agar, gum arabic, pectin, starch, carrageenan, gelatin and others which are

used to modify the texture so as to produce a chewy product, must be printed and processed first before being packaged (SNI 3547.2-2008).

Jelly candy can be reviewed through several aspects that are assessed based on the five senses, namely aroma, color, texture and taste.

a) Aroma is an important component to determine consumer acceptance and

- preference for a product that describes the characteristics of the product (Winarno 1997). Testing of food ingredients for aroma in the food industry is very important because it can provide an assessment of the processed product industry.
- b) Color is a factor that is considered in the organoleptic analysis of a product because the panelists will judge it visually (Soekarto 1990). Researchers tend to like products that have attractive colors. Color is influenced by coloring materials, shape and size of a product.
 - c) Texture is a factor that plays an important role in the formulation of jelly candy to be consumed. The level of preference received by the panelists was not too soft and not too hard, it was stated that the panelists liked chewy or elastic jelly candies.
 - d) Taste is a determining factor for a product that plays an important role in the liking and acceptance of a food product. Taste plays an important role in determining the consumer's final decision to accept or reject a food. Factors that affect the taste buds include solvent, temperature, the surface area of the tongue touched to the material, the concentration of the ingredients, the composition of ingredients and mixtures with the same taste, and the adaptation process of the panelists.
- propylene glycol, sorbitol and mannitol, but insoluble in alcohol, acetone, carbon tetrachloride, benzene, petroleum ether. and other organic solvents.
- b) Granulated sugar is one of the ingredients added to the process of making jelly candy. The addition of sugar in the manufacture of jelly candy has a function to provide a sweet taste and can also be used as a preservative, which in high concentrations inhibits the growth of microorganisms by reducing the water activity of foodstuffs.
 - c) Glucose syrup has been used by the candy industry, soft drinks, biscuits and so on. Glucose is preferred because it can prevent microbiological damage and improve texture.
 - d) Citric acid is an organic acid that is widely available in the body for citron. and serves as a sour taste, quickly dissolves in water. Citric acid also acts as a preservative in syrup and beverage products. The weakness of citric acid is that it is easy to absorb moisture (hygroscopic) so that it requires sufficient attention in storage (Kumalaningsih, 2005).
 - e) Food flavorings are defined in detail in SNI 01-7152-2006 that flavorings are food additives in the form of concentrated preparations, with or without flavoring adjuncts that are used to give flavour, with the exception of salty, sweet, and sour tastes.
 - f) Sugar that has undergone refining so that it is in the form of powdered sugar is called flour sugar. Sugar flour has a smooth nature, therefore sugar flour is used to make cream or cakes, sprinkles for cakes, or sprinkles for pastries.

2.4 Jelly Candy Ingredients

The ingredients used to make *jelly candy*, namely:

- a) Gelatin is used as a gelling agent in the food and pharmaceutical industries. The use of gelatin in the manufacture of jelly candy can inhibit the crystallization of sugar, change the liquid into an elastic solid, improve the shape and texture of the resulting jelly candy (Rahmi et al., 2012). The properties possessed by gelatin are odorless, almost tasteless, colorless, soluble in water, acetic acid and alcohol solvents such as glycerol,

3. Methodology

The data analysis technique in this study is a qualitative descriptive analysis technique. It aims to describe the utilization of moringa leaf powder as a jelly candy flavor ~~both~~ in terms of taste, texture, color and aroma. In this analysis, it is also supported by organoleptic tests. According

to Jellinek (1985) in his book "*sensory evolution of food*", organoleptic tests are subjective testing of materials with the help of the five human senses and supported by Experiments. Data collection techniques in this study were using experimental tests. According to Andi Prastowo (2011: 146), the experimental test is a research method that seeks to examine the relationship between the quality of an event by manipulating the object of research, as well as controlling.

4. Results and Discussion

In the process of making jelly candy with moringa leaf flavor, a number of

equipment and kitchen utensils are required. The object observed was a jelly candy with the addition of leaf powder moringa as a flavor . Data collection is carried out by conducting tests experiments and organoleptic tests. Organoleptic observations need to be done to determine the quality of the jelly candy in term of taste, aroma, texture and color. In this study, the author conducted an experiment with jelly candy as the main ingredient. Writer replace use pasta fruit and food colorant with moringa leaf powder (which already mixed with water) for to produce natural flavors jelly candy with high nutritional value.

The following is a recipe for making jelly candy with moringa leaf flavor:

Table 2 . Jelly Candy Recipe with Moringa Leaf Powder Flavor

No	Ingredient	Amount
1.	Jelly	10 gr
2.	Sugar sand	400 gr
3.	Water	250 cc
4.	Powder leaf moringa	5 gr
5.	Water (for added to powder leaf moringa)	20 cc

Source: Research (2022)

4.1 Making Jelly Candy with Moringa Leaf Powder Flavor

Jelly candy with the addition of moringa powder as a flavor is the same as making jelly candy in general, except that the addition of fruit paste and food coloring is removed and replaced with the addition of moringa leaf powder The experiment of making jelly candy with Moringa leaf powder flavor was carried out four times, in order to get the right results. The following is the process of making jelly candy with moringa leaf powder flavor:

a) Mixing and Cooking Process

First, put the gelatin powder, sugar and water into the sauce pan. Then heat over medium heat while stirring until it boils.



Source: Study (2022)

Figure 1. Jelly Candy Ingredients Mixing Process

b) After boiling, turn off stove. Stir batter sugar and jelly until the temperature down.



Source: Study (2022)

Figure 2 . Jelly Candy Dough Mixing Process

- c) Slowly pour the moringa leaf powder that has been melted with water, mix well. Then strain the dough so that it is free from dirt particles (foreign objects).



Source: Study (2022)

Figure 3. Process of Pouring Moringa Leaf Pasta

- d) Pour the jelly candy dough with the flavor of the filtered moringa leaf powder onto the tray, and let it sit at room temperature until it hardens.



Source: Study (2022)

Figure 4. Process of Pouring Batter Jelly Candy With Moringa Leaves Flavor

- e) Drying and Storage
Take out the jelly candy dough flavored with moringa leaf powder from the tray, then cut into pieces in desired size.



Source: Study (2022)

Figure 5. Process of Cutting Candy Jelly With Moringa Leaf Flavor

- f) Dry in the sun for three days. After the sugar crystals appear, it is a sign that the jelly candy is ready to serve.



Source: Study (2022)

Figure 6. Jelly Candy with Moringa Leaf Powder Flavor

- g) Store in a dry and airtight jar



Source: Study (2022)

Figure 7. Jelly Candy Storage With Moringa Leaves Flavor

Data analysis using organoleptic test on jelly candy with the addition of moringa leaf powder as a flavor that is judged in terms of taste, aroma, texture and color, carried out for two days and assessed by 20 panelists consisting of one expert panelist as from CDP Pastry at Four Seasons Resort Bali at Jimbaran bay , 16 untrained public panelists and three children panelists. Results test organoleptic from 20 people with results:

- a) Flavor. Five out of 20 panelists stated that jelly candy with moringa leaf powder flavor has a very sweet and distinctive taste of moringa. Nine as panelists stated that jelly candy with moringa leaf powder flavor has a sweet

and distinctive taste of moringa, and six panelists stated that the taste is quite sweet with distinctive taste of moringa., Jelly candy with the addition of moringa leaf powder as flavor get 79% results with the interpretation criterion are as good.

- b) Scent. Based on evaluation of 20 panelists about scent of the jelly candy, one panelist stated that it has a very distinctive moringa aroma, 10 panelists stated that jelly has a distinctive moringa aroma, 5 five panelists stated that it was quite flavored with moringa, and four panelists stated that the jelly candy's scent is not distinctive enough. The aroma of jelly candy with the addition of moringa leaf powder as a flavor get results of 68% with interpretation criterion as good
- c) Texture. Ratings obtained from 20 panelists about texture candy jelly with Moringa leaf powder flavor is, 1 panelist stated very springy, 9 panelists state that candy jelly with flavor powder leaf chewy moringa, and 3 person panelist stated not enough springy. Texture. Jelly candy with the addition of Moringa leaf powder as a flavor get results 68% with criteria interpretation criterion is good.
- d) Color. One out of 20 panelist, stated that the jelly candy color is very green as typical moringa. One panelists stated that it is green, eight panelists state that it is green enough, and 10 panelists stated the color of the jelly candy is yellowish-brown.
- e) Jelly candy with the addition of moringa leaf powder as flavor got 53% results with the interpretation criterion being quite good. When viewed from the overall average, the results obtained were 67% with the interpretation criterion of good

5. Conclusion

Based on the organoleptic test which has Based on the organoleptic test which has

conducted by 20 panelist, the jelly candy with moringa leaf flavor is good (79%), and most of the panelists stated that the taste of jelly candy with moringa leaf powder flavor is sweet and has a distinctive taste of moringa. Then in terms of aroma and texture each get interpretation criterion of good which is 68%, because most of the panelists stated that the aroma is distinctive and has a chewy texture. Lastly, in terms of color the interpretation criteria obtained is quite good, namely 53%, because most of the panelists stated that the color of the jelly candy is yellowish brown. In brief, the utilization of moringa leaf powder as a jelly candy flavor is good referring to the total interpretation criterion of 67%.

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