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Innovation of Milk Fish Sausage with the Addition of Moringa Leaf Puree as a Healthy Food

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ABSTRACT
Eating healthy food is a routine that everyone must do to avoid the Covid-19 virus. Antioxidants are substances that can prevent cell damage from free radicals. One food ingredient that has a high antioxidant content in Moringa leaves. Moringa leaves are a local food source that has been widely used by the community. Moringa leaf puree can be added to processed foods, namely milkfish sausage. Milkfish sausage is a processed milkfish sausage made to provide a variety of processed milkfish because in Gresik there are many milkfish cultivators, besides that, processing milkfish is also quite difficult because of the many spines contained in the milkfish. The addition of Moringa leaf puree to the production of milkfish sausage is one of the most nutritious and practical food innovations. The purpose of this development is to provide innovation to people who are still difficult to choose foods that are practical and rich in antioxidants to increase the body's immunity. This development is an innovation of processed sausage made from milkfish with the addition of Moringa leaf puree. So that it can be used in the household or medium-sized industrial sphere as a typical Gresik souvenir.
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Keywords: *Milk Fish Sausage, Moringa Puree, Healthy Food*

1. INTRODUCTION

The Covid-19 pandemic has hit almost all countries in the world, including Indonesia. One way that can be done is to apply health protocols, namely the 3M method (washing hands, maintaining distance, and wearing masks). In addition, the way that can be done is to eat healthy and nutritious foods. Foods are very important to build a strong immune system to avoid viral infections. At this time, many people choose healthy foods for daily consumption to maintain body immunity. According to Andarwulan (2020) Saying that the Covid-19 pandemic has raised public awareness to consume healthy food to increase body immunity. Eating a balanced diet has become a new habit. [1]

Sausage is a salted and seasoned meat product, derived from the Latin salsus (salt). This product is more popular because of its oval shape, delicious taste, and practicality. In addition, sausages are also widely used for various types of processed foods, sausages are also often served fried or grilled and given various kinds of sauces. In general, sausages are made from beef and chicken, however, sausages can also be made from fish meat, because the quality of fish meat protein tends to be better than beef protein, besides that the fat content in fish is lower than beef fat [2]

Making sausages made from milkfish is an alternative for people who do not like to consume milkfish directly because the spines contained in milkfish are very many, milkfish have a source of protein (20-24%), amino acids, fatty acids, minerals, and vitamins. The highest amino acid composition is glutamate at 1.386% (freshwater) and 1.268% (brackish water) [3].

The highest unsaturated fatty acid is oleic 31-32%, macro minerals in milkfish meat are: Ca, Mg, Na, and K. The micro minerals consist of Fe, Zn, Cu, Mn. The vitamin content of milkfish meat includes vitamins A, B1, and B12. To make variations in the taste of milkfish sausage which includes color, taste, texture, aroma, and elasticity, other useful ingredients are added and are the use of local food ingredients.

Moringa leaves are a local food source that has been widely used by the community. Usually, Moringa leaves are processed into tea and also processed by some people for a side dish of rice. Moringa leaves have 2 times more protein than cow's milk, 25 times more iron than spinach, 4 times more vitamin A than carrots, and 4 times more calcium than milk calcium [4]. The advantages of Moringa leaves are good and natural sources of nutrients for health, especially in poor nutrition, and have abundant properties. In addition, Moringa leaves can also be used to create innovations in food or beverages and are believed to have good and natural sources of nutrients to cure various diseases and can be used in many traditional therapeutic ways [5].

The addition of Moringa leaf puree in the manufacture of milkfish sausage is intended to increase the nutrition of milkfish sausage. Moringa leaves are very rich in nutrients, including calcium, iron, protein, vitamin A, vitamin B, and vitamin C [6]. Moringa leaves contain higher iron than other vegetables, which is 17.2 mg/100 g [7]. The addition of Moringa leaf puree in making sausages is expected to increase the nutritional value, be accepted by the panelists, and affect the chemical properties of the sausages produced. In this production, there will be an innovation of adding Moringa leaf puree to milkfish sausage.

2. METHOD

The method of data collection in this study is the observation method with organoleptic tests which include taste, color, texture, aroma, and elasticity with a scale of 1-5. The organoleptic test is a test method using the human senses as the main tool for measuring product acceptance. The organoleptic test was carried out by 30 trained and semi-trained panelists data collection technique used is observation, namely by making direct observations. The object of study and preference testing uses human senses to measure the texture, appearance, aroma, and flavor of food products. The aim is to assess several aspects including taste, color, texture, aroma, and elasticity. The instrument was developed using an organoleptic test instrument in the form of a preference test which was given to panelists to assess the product based on preference for taste, color, texture, aroma, and elasticity.

3. RESULT AND DISCUSSION

3.1. Formula of Mocha Sausage

Based on the results of the 1st, 2nd, and 3rd trial tests, the best formula was "Mocha Sausage" which was used as an ingredient to be tested on at least 30 panelists: milkfish 1.000 g, tapioca 250 g, white egg 180 g, moringa puree 120 g, garlic 120 g, turmeric 20 g, coriander 50 g, salt 20 g, sugar 10 g.

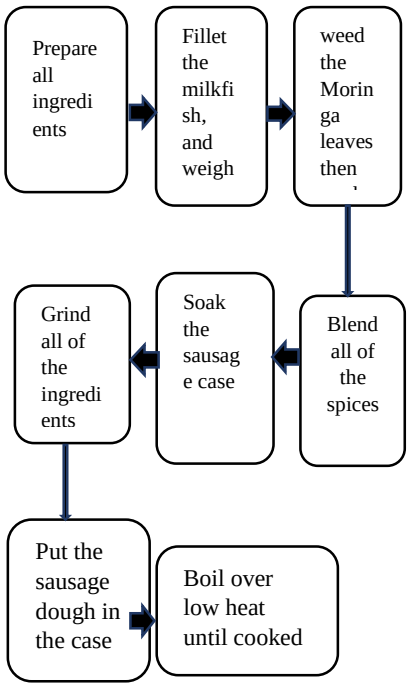

Figure 1. Flow diagram of Mocha Sausage

Figure 2. Mocha Sausage's Picture

3.2. Hedonic Test Results

3.2.1. Colour

The results of the panelists' assessment of the color "Mocha Sausage" are presented in the form of a pie chart in Figure 3.

The results of the panelists' assessment of the criteria for the color of mocha sausage were 33.33% of the panelists chose very much like it, 60% chose to like it, and 6.67% chose it less. It can be concluded that 93.33% of the panelists like the color of mocha sausage. Mocha sausage is expected with the addition of light-colored Moringa leaf puree and there are green spots obtained from the addition of Moringa leaf puree. This is possible because of the color combination of the basic ingredients used namely moringa leaf puree and a little bit turmeric. The green color is due to the addition of Moringa leaf extract which contains chlorophyll or green pigment.

Moringa leaves contain chlorophyll at a higher concentration than other vegetables. Research says that Moringa leaves contain 162 mg of chlorophyll; per 8 grams of dry powder. In addition, Moringa leaves also contain high levels of polyphenols.

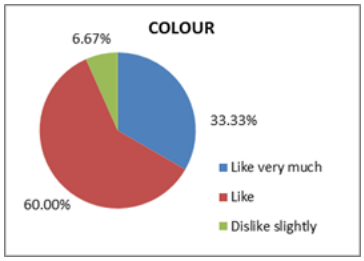

Figure 3. Hedonic Test of Color

The assessment of dislike for the color of Mocha Sausage is 6.67%, which is possible because of the color (a bit dark). The green color is due to the basic ingredients used, namely moringa leaf.

3.2.2. Flavor

The flavor is an important factor in influencing product selection. The results of the panelists' assessment of the aroma of "Mocha Sausage" are presented in the form of a pie chart in Figure 4.

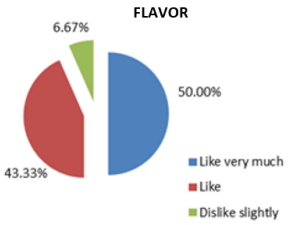

Figure 4. Hedonic Test of Flavor

The results of the panelists' assessment of the criteria for the aroma of Mocha Sausage are as many as 50% of panelists choose very like, 43.33% choose to like, and 6.67% choose less. It can be concluded that 93.33% of the panelists liked the aroma of Mocha Sausage. Mocha sausage is expected with the addition of Moringa leaf puree which has a savory aroma typical of milkfish, not fishy, and has a slight aroma of Moringa. This is obtained because the materials used are milkfish and Moringa leaves.

This is possible because of the aroma combination of the basic ingredients used, namely milkfish, garlic, and coriander into a distinctive aroma. The panelists' preference for the smell of sausage is also possible because the milkfish itself has a distinctive aroma and is added with spices that have a savory aroma, namely garlic, and coriander.

3.2.3. Taste

The results of the panelists' assessment of the taste of "Mocha Sausage" are presented in the form of a pie chart in Figure 5

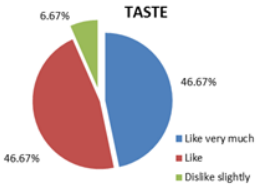

Figure 5. Hedonic Test of Taste

The results of panelists' assessment of the criteria for the taste of instant spiced coffee were as many as 46.67% of the panelists chose very much like it, 46.67% chose to like, and 6.67% chose less. It can be concluded that 93.33% of the panelists liked the taste of Mocha Sausage.

The taste of Mocha Sausage has a savory taste that comes from milkfish and additional spices. This is possible because the combination of basic ingredients used, namely spice garlic, coriander, salt, and sugar becomes a distinctive taste. Milkfish has a distinctive taste when cooked, it has a distinctive savory taste with the addition of spices to make the mocha sausage more savory and tasty.

3.2.4. Elasticity

The results of the panelists' assessment of the color "Mocha Sausage" are presented in the form of a pie chart in Figure 6. The results of the panelists' assessment of the criteria for the elasticity of mocha sausage were 33.33% of the panelists chose very much like it, 60% chose to like it, and 6.67% chose it less. It can be concluded that 93.33% of the panelists like the elasticity of mocha sausage.

Sensory assessment of the elasticity of the Mocha Sausage was carried out using the sense of taste (taste) and the sense of touch (pressed). The Mocha Sausage has the right elasticity. This is possible because the combination of basic ingredients used, namely tapioca and ice cube, because tapioca is made from cassava starch, and also tapioca does not contain gluten, causing tapioca-based preparations to be chewy and the addition of ice cubes makes the texture more

chewy because the ice cubes have a solid shape, not liquid like water which can make a liquid sausage dough The lower temperature of the ice cubes compared to water, also affects the elasticity of the dough so that the sausage texture becomes chewier.

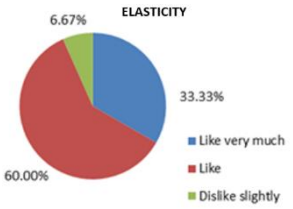

Figure 6. Hedonic Test of Elasticity

4. CONCLUSIONS

The best formula based on the results of the 1st, 2nd, and 3rd trial tests is milkfish 1.000 g, tapioca 250 g, white egg 180 g, moringa puree 120 g, ice cube 600 g, garlic 120 g, turmeric 20 g, coriander 50 g, salt 20 g, sugar 10 g. And The panelist's level of preference for color is 93.335 likes, the flavor is 93.33% likes, tastes is 93.33% likes, and elasticity 93,3%

It is necessary to conduct a preference test on a wider range of panelists/consumers to determine consumer acceptance of Mocha Sausage products so that they can be produced commercially. Mocha Sausage can be consumed every day because there are no preservatives and easy processing and can be mixed in any dish. Further research can be done to determine the shelf life of Mocha Sausage. Appearance can be improved by using attractive packaging and labeling.

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