



SUBSTITUTION OF YELLOW PUMPKIN FLOUR (*Cucurbita Moschata*) IN THE MANUFACTURE OF STEAMED SPONGE AS A HIGH-FIBER SNACK

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ABSTRACT

Yellow pumpkin has a very high fiber content. Fiber is very good when used in making a soft diet in maintaining health and can launch metabolism. The use of yellow pumpkin as flour in making steamed sponges has not been done much research on its nutritional value and advantages. Yellow pumpkin can be processed into free gluten flour so that it is safe for consumption by the public, facilitates storage and can increase selling value. One bakery product that allows to add or replace some of the flour is steamed sponge. With the creation of the innovation of steamed sponges, yellow pumpkin flour is expected to be a healthy snack high in fiber. This study aims to obtain organoleptic test results and fiber content from steamed sponges made from yellow pumpkin flour. The method used was a true experiment with the Posttest Only Control Group design, which was then analyzed descriptively. This research consists of three stages, namely product development, product acceptance testing by panelists, and fiber content testing at the Organic Chemistry laboratory of FMIPA University of North Sumatra. The results of organoleptic tests obtained a very liking level for color by 48.0%, very liking for aroma by 36.0%, liking texture by 44.0% and a very liking level for taste by 36.0%. The results of the fiber content test were obtained at 55.14% from the mass of 33.58 grams of steamed sponge yellow pumpkin flour. The conclusion that based on the overall results of organoleptic tests of steamed sponge yellow pumpkin flour can be accepted by the public in terms of color, aroma, texture, and taste.

Keywords: fiber; pumpkin flour; steamed sponge cake

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INTRODUCTION

(WHO) suggests consuming 25–30 grams of fiber daily. By Dietary Reference Intake (DRI) National Academy of Sciences, a healthy daily fiber intake is between 19 and 38 grams, depending on the age of the consumer. (Prasetio et al., 2021). The non-starchy polysaccharides present in all plant-based diets are called fiber. Although it cannot be digested, fiber is beneficial for health. Dietary fiber, also referred to as Dietary Fiber (DF), is a type of complex carbohydrate found in the cell walls of food plants. These carbohydrates are difficult to break down by digestive enzymes and are not absorbed by the human digestive system. Therefore, in contrast to proteins, lipids, and carbohydrates, fiber is often overlooked in the diet. To aid in the process of digestion of food, it has been proven that fiber supplements should be added to regular meals in addition to essential elements including water, proteins, fats, carbohydrates, and vitamins. Therefore, fiber still plays an important function in human health. (Prasetio et al., 2021).

As one of the components of carbohydrates, fiber helps maintain water content and produces a thick liquid in the digestive tract, so it can prolong satiety. Fiber can help prevent obesity because it slows down the natural process of digestion of food, thereby reducing the body's desire to eat more than necessary. (Zaki et al., 2022) A sufficient amount of fiber in the body can help increase water content and provide the perfect stool shape, to reduce excessive contractions in the digestive tract and facilitate the discharge of feces. Because the time is shorter than usual between when food enters the body and when the food is removed as leftovers that are not needed by the body, the chance of carcinogenic substance buildup will be smaller, so it will reduce the risk of developing colon cancer. (Santoso, 2021)

Fruits and vegetables are good sources of fiber, vitamins, and minerals. Bioactive substances that are included in the category of antioxidants and can prevent cell damage include vitamins and minerals. In addition to aiding digestion, fiber has the ability to stop and slow the growth of colon cancer cells. Fiber helps improve digestion and can stop or slow the growth of colon cancer cells. (PERMENKES, 2019b) Geographically, this shows the wealth of Indonesia's natural resources due to the diversity of flora, fauna, hydrography, and natural resource stores. Indonesia's natural resources come from mining, energy, plantations, fisheries, forestry, marine, and animal husbandry. In Indonesia, plantation crops can be divided into two broad categories based on their planting age, namely annual plants and annual plants. Among the perennial crops that are seeded are plants that are specifically utilized in agriculture, such as the yellow pumpkin plant (*Cucurbita moschata*). (Mahrita et al., 2023)

In Indonesia, yellow pumpkin is an annual plant that is found in the highlands and is a type of vine. In addition to its attractive color and aroma, yellow pumpkin has good taste. Pumpkin fruits can be well stored for a long time. As long as there are no cuts or surface damage, yellow pumpkin fruit can last four months to years. (Purwidiani and Bahar, 2022) The cucurbitaceae family includes yellow pumpkin (*Cucurbita Moschata*) which is native to various regions in Indonesia. In 2021, Indonesia produced 270,000 tons of yellow pumpkin annually in Java, 94,000 tons in Sumatra, and 70,000 tons in Bali. This output is relatively significant, particularly in North Sumatra. In 2020, yellow pumpkin consumption amounted to 112,027 tons per year, and in 2021 it was 109,428 tons per year. (BPS, 2021)

Yellow pumpkin is rich in nutrients with a variety of vitamins and minerals in it, such as beta-carotene, vitamin B1, vitamin C, calcium, phosphorus, iron, potassium, and sodium. This fruit also contains antioxidants that are beneficial to health. In every 100 grams, yellow pumpkin contains about 29,030 IU of vitamin A, 23 mg of vitamin C, 66 mg of magnesium, 113 mg of calcium, 118 mg of phosphorus, 1.8 mg of iron, 9 mg of sodium, 1,089 mg of potassium, and 2.70 grams of dietary fiber. (Subaktilah et al., 2021) Yellow pumpkin is a good fruit to boost immunity because of the minerals it contains. Its beta-carotene content helps prevent heart attacks. Meanwhile, fiber, vitamin C, and vitamin B1 are all high enough when combined to create a gentle diet that promotes health. (Mardhiah, 2020) In addition, yellow pumpkin has a role as a regulator and prevention of body diseases and can launch metabolism (Hatta & Sandalayuk, 2020) (Mardhiah, 2020)

A person can get all the vitamin A his body needs by consuming 70 grams of pumpkin every day. You only need to eat 2.5 grams of this fruit daily if you make flour from it. Given its nutritional value, processed yellow pumpkin is highly recommended for consumption in the elderly and children. In general, yellow pumpkin processing is still only in the form of processing products such as compote, vegetable boiling, or steaming. Actually, yellow

pumpkin can be used as a substitute food to meet the needs of fiber and carbohydrates. (Fitri, 2022)

Due to its high water content, yellow pumpkins are prone to damage when transported. Therefore, yellow pumpkins must be processed to produce products such as flour that are more practical to store and have a longer shelf life. Processing yellow pumpkin into flour can increase its shelf life and provide added value. Yellow pumpkin flour can increase the nutritional value of food, especially its fiber content, so it is suitable for use as food fortification. This is very appropriate for children's food menus. (Kandoli & Tulaka, 2022) If made into flour, yellow pumpkin can be used as an additional component or substitute in processed foods. By utilizing yellow pumpkins to make flour, people want to improve public health and food quality by utilizing the high beta-carotene and crude fiber content of this fruit. Yellow pumpkin flour has the following composition: water 6.4%, ash 7.4%, fat 2.19%, protein 8.15%, carbohydrates 75.86%, and dietary fiber 21.74%. (Inda, 2018). Yellow pumpkin flour can be categorized as a food high in dietary fiber based on the findings of Inda's research (2018) because 100 grams of yellow pumpkin flour contains 21.74 grams of dietary fiber. For high-fiber solid products, the Food and Drug Administration (2016) sets a minimum standard of 6 grams of dietary fiber per 100 grams of product. (Amaliyah, 2023)

Many processed dishes, including wet noodles, puff pastry, white bread, pancakes, flakes, cakes, and traditional Malay sponge cakes, are made from high-fiber yellow pumpkin flour. This shows that more and more food products are starting to use yellow pumpkin flour. Because of its ability to gelatinize, yellow pumpkin flour has good quality and can produce dough with good consistency, elasticity, viscosity, and elasticity. The finished product will be of high quality in this way. In addition, along with the increasing availability of yellow pumpkin flour, more and more people are using it as raw material in the food business. (Amaliyah, 2023) Numerous studies have examined the fortification of pumpkin flour in bread, pancakes, wet cakes, puddings, and ice cream. Steamed sponge is one of the bakery foods that allows adding or replacing some flour. One type of sponge cake called is steamed sponge, made with a composition of sugar, eggs, and other compositions that are stirred until fluffy and then steamed. The characteristic of steamed sponge cake is its bowl-like shape and fluffy middle. A quality steamed sponge should have a soft, smooth texture and be evenly divided into four parts on its surface. When pumpkin flour is added to steamed sponge cakes, it not only increases the nutritional value of flour derived from local raw resources but also results in a popular and healthful steamed sponge product. (Wulandari, Nur Asyik, 2019)

In 100 grams of steamed sponge cake which is generally made from wheat flour, there are 26 grams of carbohydrates, 3 grams of protein, 3.50 grams of fat, and 1 gram of fiber. (Secret, 2023). Yellow pumpkin flour steamed sponge cake is an innovation that aims to reduce the amount of wheat flour consumed by the public. It is common knowledge that gluten is a protein found in wheat flour, has a bad effect on the body if consumed in excess. As a result, our body's ability to absorb nutrients may be impaired. Gluten-related allergies, elevated blood sugar, increased risk of heart disease, and impaired mineral absorption are some of the adverse health effects associated with wheat flour. (Zatalini, 2021) The steamed sponge is a snack that is favored by various groups, so researchers conducted experiments in making it. The softness of its texture, sweetness, and variety of shapes make it a favorite among the public. Without preservatives, steamed sponges can last two to three days. Besides being fast and cheap to make, steamed sponges are also relatively easy to make.

Therefore, researchers are interested in creating steamed sponge products using yellow pumpkin flour and coconut sugar as a substitute for granulated sugar. This type of sugar is produced without the use of chemicals so that it can be an alternative to natural sweeteners. Because it is not refined, this sugar still retains fiber content, vitamin C content, and pure minerals such as calcium, iron, and magnesium. (ArengaIndonesia,2024) Making this steamed sponge is made with the hope of producing high-fiber steamed sponges that are beneficial for the health of the body and can be used as healthy snacks that can be consumed. From the background of the problems mentioned, researchers feel interested in developing innovations in processed food as high-fiber snacks by using yellow pumpkin flour in making steamed sponges. In order to increase interest in eating yellow pumpkin, it is necessary to innovate food products. This is so that more people can process and utilize yellow pumpkin which has an impact on increasing the amount of yellow pumpkin consumption. The purpose of this study was to identify the amount of fiber contained in steamed sponges using yellow pumpkin flour as well as to test the degree of acceptance or acceptance of such products by panelists

METHOD

This research is a type of quantitative research that uses a true experimental study design with a Post-Test Only Control Group Design. Analysis of research results is carried out descriptively, which describes the collected data. This research was conducted in three stages, namely the product development stage, organoleptic test, and fiber content test, focusing on the substitution of yellow pumpkin flour in the manufacture of steamed sponges. Organoleptic tests were conducted on steamed sponges employing hedonic tests to evaluate panelists' preference levels concerning color, texture, aroma, and taste. The rating scale ranged from "Dislike" (1) to "Very, very likes" (5), allowing panelists to indicate their preferences across various sensory aspects of the steamed sponges. Samples of steamed sponge products were given to untrained panelists for acceptability testing. The untrained panelists were more than 25 laypeople determined by gender, education, ethnicity, and social status. Untrained panelists can only assess common organoleptic properties, i.e. liking traits, and no differentiation test data can be used. These untrained panelists are students of UIN North Sumatra with a total of 25 students. This research will be conducted in January 2024 - March 2024.

The process of making yellow pumpkin flour is carried out at the researcher's house (Jl. Buntu Pane, Dusun V, Asahan). For fiber content measurement using the gravimetric method in the Organic Chemistry laboratory FMIPA University of North Sumatra. The process of making yellow pumpkin flour steamed sponge has two stages, namely the stage of making flour and the stage of making steamed sponge. The initial stage in making yellow pumpkin flour is the preparation of yellow pumpkin, separation of clay and seeds, then washed under running water, then yellow pumpkin thinly sliced using a knife, then dried in the sun within 2 days until thin pieces of yellow pumpkin turn a light color. If the thin pieces of yellow pumpkin are not dry enough, they can be baked using the oven at the lowest temperature until the yellow pumpkin slices appear dry. Next, the yellow pumpkin slices are blended until they become flour and then filtered to make them smoother. This is so that yellow pumpkin flour is easy in the refining process and lasts longer. The second process is to make steamed sponges with yellow pumpkin flour. The initial stage in making steamed sponge is the preparation of the main ingredients of yellow pumpkin flour 80 grams, chicken eggs 3 eggs, coconut sugar 3 tbsp, developer 1 tsp, softener 1 tsp, vanilla 2 grams, margarine 65 grams. All ingredients are mixed except yellow pumpkin flour, then mixer for 10 minutes to form a dough, then add yellow pumpkin flour and mixer for 5 minutes until the whole dough is well mixed. Next, the dough is poured into molds and steamed for up to 30 minutes using medium heat.

RESULTS

The table below displays the results of organoleptic tests conducted on steamed pumpkin flour steamed sponges using the hedonic scale (favorability level)

Tabel 1.
Frequency Distribution of Color Organoleptic Test on Steamed Sponge of Yellow Pumpkin

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Do not like	1	4.0	4.0	4.0
	Do not like it much	1	4.0	4.0	8.0
	Like	12	48.0	48.0	56.0
	Really like	10	40.0	40.0	96.0
	Very Very Like	1	4.0	4.0	100.0

Table 1, it can be concluded the results of organoleptic analysis of the color of steamed sponges using yellow pumpkin flour. The "likes" category had the highest score of 12 (48.0%). These results show that panelists think that the color of steamed sponge with yellow pumpkin flour is considered quite good.

Tabel 2.
Frequency Distribution of Texture Organoleptic Test on Steamed Sponge of Yellow Pumpkin Flour

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Do not like	1	4.0	4.0	4.0
	Do not like it much	1	4.0	4.0	8.0
	Like	9	36.0	36.0	44.0
	Really like	11	44.0	44.0	88.0
	Very Very Like	3	12.0	12.0	100.0

Table 2, it can be seen that panelists really like the texture of steamed sponges using yellow pumpkin flour, as is evident from the results of organoleptic tests. The texture of steamed sponge with yellow pumpkin flour received the highest score of 11 (44.0%) in the "very liked" category

Tabel 3.
Frequency Distribution of Aroma Organoleptic Test on Steamed Sponge of Yellow Pumpkin Flour

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Do not like	1	4.0	4.0	4.0
	Do not like it much	8	32.0	32.0	36.0
	Like	9	36.0	36.0	72.0
	Really like	6	24.0	24.0	96.0
	Very Very Like	1	4.0	4.0	100.0

Table 3 indicate that in organoleptic tests, the aroma in steamed sponges using yellow pumpkin flour received the highest score of 9 (36.0%) in the "like" category. These results illustrate that panelists think that steamed sponge with yellow pumpkin flour has a pleasant or pleasant aroma.

Tabel 4.
Frequency Distribution of Organoleptic Taste Tests on Steamed Pumpkin Flour Cake

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Do not like	1	4.0	4.0	4.0
	Do not like it much	7	28.0	28.0	32.0
	Like	4	16.0	16.0	48.0
	Really like	9	36.0	36.0	84.0
	Very Very Like	4	16.0	16.0	100.0

Table 4 shows that the taste value in steamed sponges using yellow pumpkin flour reached the highest value of 9 (36.0%) in the "very like" category. From these results, it can be concluded that the panelists really liked the taste of steamed sponges using yellow pumpkin flour. Furthermore, steamed sponge yellow pumpkin flour was tested for fiber content at the Organic Chemistry Laboratory FMIPA University of North Sumatra.

Tabel 5.
Test Results of Fiber Content on Steamed Sponge of Yellow Pumpkin Flour

No	Parameter	Units	Test results	Test Method
1	Fiber	%	55,14	Gravimetry

The results of the fiber content test in Table 5 conducted at the Organic Chemistry laboratory of FMIPA USU obtained the results of 33.58 grams of steamed sponge yellow pumpkin flour containing a high fiber of 55.14%.

DISCUSSION

Acceptability to the color of steamed sponge yellow pumpkin flour

Color organoleptic testing resulted in panelists liking steamed sponges made from yellow pumpkin flour and scoring highest in the category of the likes at 12 or 48.0% as shown in Table 1. The resulting steamed sponge has a yellow-brown color. The color of the steamed sponge will become browner due to the influence of yellow pumpkin flour on the color of the final product if the concentration of yellow pumpkin flour. Color is an image and pattern perceived by the sense of sight. Color is the main aspect that is noticed, other factors come into focus later. Therefore we can conclude that color is a quality characteristic that determines the appearance of food products. (Silaban, 2023) Based on the results of the study (Yuniari, 2023) With the highest score of 82.4%, panelists said they liked steamed sponge cakes based on the results of organoleptic tests conducted on the color. With the criteria of being very fond because this steamed sponge has a brown color that tends to be more lit even without the addition of dyes.

Based on research (Yuliastuti et al., 2023) Processed food products based on yellow pumpkin flour that have been made from training activities at posbindu RW 6 Pondok Benda, South Tangerang have a good taste with a fairly attractive appearance. The addition of yellow pumpkin can provide a natural color that is expected to reduce the use of synthetic dyes. Sensory assessment of color is quite preferred, with the resulting color being light yellow to dark yellow.

Acceptability to the texture of steamed sponge yellow pumpkin flour

Based on the results of organoleptic tests on texture, information was obtained that steamed sponges using yellow pumpkin flour received the highest score of 11 (44.0%) in the category of "very liked", as listed in Table 2. Measuring the hardness or consistency of food products using the sense of touch is one way to identify food texture that is an assessment factor

(Hartati & Nurhidayati, 2020). When assessing the quality of foodstuffs, texture is an important factor. The texture of an ingredient will affect its taste in food. (Vidyastari, 2022) Based on the results of the study (Zatalini, 2021) There is a slight variation in the texture of steamed sponge cake between the two treatments. The amount of wheat flour, red bean flour, and oyster mushroom flour has an impact on the texture of steamed sponge cake. There is a difference in the texture of the P2 steamed sponge which is slightly harder because it contains a mixture of 80% wheat flour, 10% red bean flour, and 10% oyster mushroom flour. Meanwhile, P1 steamed sponge with a composition of 75% red bean flour, 20% wheat flour, and 5% oyster mushroom flour, has a softer texture. The texture and consistency of an ingredient can affect how quickly the salivary glands are stimulated, which in turn can change the taste of the ingredient.

Based on research (Mahalia et al., 2022) The amount of gluten in the dough will decrease as the proportion of pumpkin increases, thus affecting how soft the steamed cake is. Due to the high content of pumpkin, steamed pumpkin sponge cake has a more moist, soft texture, and tighter pores. This theory is supported by research showing that up to 70% of respondents consider steamed sponge cakes made with P3 mixture to have a very soft texture. This is different from the formulation of steamed sponge cakes P1 and P2 which respectively 3.33% and 20% of panelists stated that steamed sponge cakes have a very soft texture.

Acceptability to the aroma of steamed sponge yellow pumpkin flour

The results of the aroma organoleptic test showed that panelists liked the aroma of steamed sponge cakes using yellow pumpkin flour because they got the highest overall score of 9 (36.0%) in the likes category (table 3). The addition of ingredients such as eggs, butter, sugar, and yellow pumpkin flour which has its own distinctive aroma in steamed sponge cakes causes fragrance to the steamed sponge cakes. The aroma of steamed sponge cake made from yellow pumpkin flour is more concentrated and pronounced. Scent is also known as long-range olfaction, where humans can detect odors from food through olfactory epithelial cells in the upper wall of the nasal cavity that are sensitive to odor components. (Fauziah, 2023)

Based on research (Wulandari, Nur Asyik, 2019) The S3 treatment (70% wheat flour: 30% yellow pumpkin) scored highest in the aroma evaluation by the panelists, with an average score of 3.71. This can be explained by the peculiarities of the aroma possessed by yellow pumpkin flour. A significant contribution to the aroma of steamed brownies is given by the use of yellow pumpkin flour. Pumpkin flour protein is responsible for pumpkin flavor because it binds to the food's taste system to create a unique aroma. The S0 treatment (100 percent wheat flour and 0% yellow pumpkin flour) had the lowest average aroma criteria panelists' ratings, with a score of 3.07. Panelists may not enjoy it even more if less pumpkin flour is added. Taste, fragrance, first impression, and speed of evaporation are examples of volatile components. The addition of yellow pumpkin flour to brownie dough affects the aroma because the reaction to the sensory quality of smell or aroma is usually associated with the smell of certain items or ingredients that are often used, such as smell, butter, vanilla, and flour.

Based on research (Radiani et al., 2020) The hedonic qualities of steamed pumpkin puree sponge cake aroma and test results are shown in Figure 1b. The next formula with a ratio of 5 grams of yellow pumpkin flour: 55 grams of wheat flour: and the other 40 grams of flour has the best hedonic quality and results, with scores ranging from 1.66 (dislikes) to 4.21 (likes). Meanwhile, hedonic quality results were obtained at 3.66 (yellow pumpkin taste) and

1.84 (not too pumpkin flavor). The reason is that the sponge cake starts to smell like pumpkin, the more pumpkin puree is added, thus masking the aroma of yeast.

Acceptability to the taste of steamed sponge yellow pumpkin flour

Based on the organoleptic taste test, panelists preferred steamed yellow pumpkin flour sponge cake because yellow pumpkin flour sponge cake had the highest favorability criterion score of 9 (36.0%) as shown in Table 4. In this study, steamed pumpkin flour cake produced a harmonious and delicious sweetness. This is by research that shows that the final product will taste sweeter and more balanced if less pumpkin flour is added (Kristianingsih, 2010). Conversely, if you use more yellow pumpkin flour, the finished dish will taste a bit bitter even though it still tastes sweet. This is because during the ripening process, the starch component of yellow pumpkin fruit which in some fruits is rather high usually experiences a decrease in carbohydrate content, causing an increase in sucrose and total sugar content due to starch hydrolysis. Taste refers to the panelists' evaluation of the taste of a food that can be seen through its sense of taste. Taste is the sense of taste, that is, the perception of sweet, sour, salty, and bitter sensations produced by mouth-soluble ingredients. When deciding whether or not to accept a food, consumers consider a lot of taste. (Surahman & Winarti, 2021)

Based on research (Mahalia et al., 2022) Formula P3 (30% yellow pumpkin: 70% wheat flour), which is steamed sponge cake with more yellow pumpkin added, tastes sweeter than formulas P2 (20% yellow pumpkin: 80% wheat flour) and P1 (10% yellow pumpkin: 90% wheat flour), which is steamed sponge cake with a little substitute for yellow pumpkin. The reason is because yellow pumpkin is different from wheat because it contains more sugar, fiber, and carotenoids (Budoyo et al., 2014). in particular sucrose, glucose, and fructose, with pumpkin (Zhou, et al., 2017). Based on research (Radiani et al., 2020) The results of the hedonic quality evaluation of the taste of steamed pumpkin puree sponge cake and the results of the hedonic test can be seen in Figure 2a. Formula with a ratio of 5 grams of yellow pumpkin flour: 55 grams of wheat flour: the other 40 grams of flour has the best quality and hedonic value, with scores ranging from 1.88 (dislike) to 3.61 (like). At the same time, the measured hedonic quality score varied from 2.02 (indicating no pumpkin flavor) to 3.88 (indicating yellowish pumpkin flavor). It is intended to increase the authenticity of the puree of the yellow pumpkin to make it sweeter and remove the yeast flavor if added with additional puree.

Fiber Content in Steamed Pumpkin Flour Cake

The World Health Organization (WHO) recommends a good fiber intake of 25-30 grams per day. Dietary Reference Intake (DRI) of fiber based on the National Academy of Sciences states that good fiber consumption is 19-38 grams per day according to the age of each consumer (Prasetyo et al., 2021) By (PERMENKES, 2019a) Fiber needs are differentiated based on age groups through the Daily Value Table (RDA) per day. Fiber needs at the age of 0-9 years are 0 grams to 23 grams, at the age of 10 - 80+ men are 22 grams to 36 grams, at the age of 10 - 80+ women are 22 grams to 32 grams, in pregnant women trimester 1-3 of +3 grams to +4 grams, and in breastfeeding mothers of the first 6 months - the second 6 months of +5 grams to +6 grams. Based on the results of the fiber content test conducted at the organic chemistry laboratory FMIPA University of North Sumatra showed the results that 33.58 g of steamed sponge made using yellow pumpkin flour has a fiber content of 55.14% (can be seen in Table 2). Therefore, this yellow pumpkin flour steamed sponge is intended as a snack So it can only meet 20% of the daily fiber needs of 7.2 grams a day. So by eating about 5 grams of steamed sponge is sufficient for fiber needs per day

Fiber helps prevent constipation as well as a good source of nutrients and vitamins for the body. Adequate fiber consumption can also lose weight. Fiber will be left in the digestive tract in a relatively short time, so the ability to absorb substances from food will decrease. Foods that contain high fiber will provide satiety because the composition of complex carbohydrates suppresses appetite, causing reduced food consumption. (Maryoto, 2019)

CONCLUSION

The results of the acceptability test research that was carried out on steamed pumpkin flour sponge cake, obtained results in the category of liking the color of the steamed sponge cake as much as 12 (48.0%), category really liking the texture of the steamed sponge cake as much as 11 (44.0%), category liking the aroma of the steamed cake as many as 9 (36.0%), and the category likes the taste of steamed sponge cake as many as 9 (36.0%). Like and really like are the choices most frequently chosen by panelists. Therefore, it can be said that the formulation carried out by researchers was successful and the use of pumpkin flour as a substitute for wheat flour to make steamed cakes was accepted by society. The organoleptic test results show that the opinion of the public is that steamed pumpkin flour sponge cake is acceptable, with a taste, aroma, color and texture that is comparable to steamed sponge cake in general. Steamed sponge cake has a combination of flavors and aromas designed to suit the panelists' tastes. How you process pumpkin affects its delicious taste. Making steamed pumpkin flour sponge cake is almost the same as making steamed sponge cake in general. In this research, the steamed sponge cake created produced a fiber content of 55.14% in 33.58 grams of steamed sponge cake. Fiber helps prevent constipation and is a good source of nutrients and vitamins for the body. Adequate fiber intake can also contribute to weight loss. Fiber will stay in the digestive tract for a relatively short time, reducing the ability to absorb substances from food. Foods rich in fiber tend to provide a feeling of fullness for longer because complex carbohydrates reduce appetite, which ultimately results in decreased food consumption. In this case, to find out whether there are changes in fiber adequacy before and after the intervention of giving steamed sponge cake containing pumpkin flour in individuals who have inadequate fiber intake, it is necessary to carry out further research on this topic.

REFERENCES

- Amaliyah, R. (2023). Utilization of yellow pumpkin flour for substitution of steamed brownies as a distraction for children.
- ArengaIndonesia. (2024). Arenga Sugar vs Coconut Sugar. Divas move forward together. <https://arengaindonesia.com/arenga-sugar-vs-coconut-sugar-beda-di-mana/>
- BPS. (2021). Production of Seasonal Vegetables and Fruits by Plant Type in North Sumatra Province 2020-2021. <https://sumut.bps.go.id/statictable/2022/03/08/2569/produksi-tanaman-sayuran-dan-buah-buahan-semusim-menurut-jenis-tanaman-di-provinsi-sumatera-utara-2020-2021.html>
- Fauziah, S. U. (2023). Acceptability of white bread with the substitution of yellow pumpkin flour (*Curcubita moschata*) and katuk leaves (*Sauropus androgynus*). In *Poltekkes Medan* (Vol. 4, Issue 1).
- Fitri, A. (2022). Benefits of pumpkin fruit for health Hadith perspective (issue 322).
- Hatta, H., & Sandalayuk, M. (2020). The Effect of Adding Yellow Pumpkin Flour on the Carbohydrate and Protein Content of Cookies. *Gorontalo Journal of Public Health*, 3(1),

41. <https://doi.org/10.32662/gjph.v3i1.892>
- Kandoli, S. J. I. P. D. S. ; N., & Tulaka, L. N. (2022). Analysis of the effect of yellow pumpkin flour (*Cucurbita moschata*) as a substitute for wheat flour on the quality of roll cake. *Sagacious*, 9(1), 1–7.
- Mahalia, L. D., Supriyono, T., & Sari, F. D. R. (2022). The use of yellow pumpkin as a substitute material for making steamed sponges to improve organoleptic quality and acceptability. *Andaliman Journal: Journal of Food, Clinical and Community Nutrition*, 2(2), 1. <https://doi.org/10.24114/jgpkkm.v2i2.38995>
- Mahrta, S., Kusumadati, W., Faridawaty, E., & Tianto. (2023). The effect of the formulation of coconut milk and yellow pumpkin (*Cucurbita moschata*) on the physical and chemical properties of ice cream. *Angewandte Chemie International Edition*, 6(11), 951–952., 3(8), 73–87.
- Mardhiah, A. (2020). Test of Acceptability and Value of Nutritional Content on the Addition of Yellow Pumpkin Flour in Making Biscuits. Thesis, Public Science, Faculty of Public Health., 1.
- Maryoto, A. (2019). Benefits of Fiber for the Body (Sulistiono (ed.); 2019th ed.).
- PERMENKES. (2019a). Regulation of the Minister of Health of the Republic of Indonesia Number 28 of 2019 concerning the recommended nutritional adequacy rate for the people of Indonesia.
- PERMENKES. (2019b). Regulation of the Minister of Health of the Republic of Indonesia Number 41 of 2019 concerning Guidelines for Balanced Nutrition. In *Applied Microbiology and Biotechnology* (Vol. 85, Issue 1).
- Prasetio, P. O., Puspita, I. D., & Fatmawati, I. (2021). Dietary fiber content and organoleptic properties of corn bran crackers with the addition of babara bean flour. *Journal of Food Technology and Nutrition*, 20(2), 130–138.
- Purwidiani, N., & Bahar, A. (2022). Organoleptic properties of steamed lapis Surabaya. *Journal of Boga*, 11(2), 1–11.
- Radiani, A., Syahrumsyah, H., & Saragih, B. (2020). Formulation of wheat flour, mocaf and yellow pumpkin puree (*Cucurbita moschata*) to the content as well as coarse, fat and sensory characteristics of steamed sponge. *Journal of Tropical AgriFood*, 2(1), 8. <https://doi.org/10.35941/jtaf.2.1.2020.3917.8-15>
- Santoso, K. (2021). Development of high-fiber snack bar products from carrots and bananas. Soegijapranata Catholic University Semarang.
- Secret, F. (2023). Nutritional Information of Steamed Bolu.
- Silaban, J. T. B. (2023). The effect of variations in the use of yellow pumpkin flour (*Cucurbita moschata*), mung bean flour (*Vigna radiata*) and lemuru fish meal (*Sardinella lemuru*) on the acceptability of Lajoru muffins.
- Subaktilah, Y., Wahyono, A., Oktavia, S., Yudiastuti, N., & Mahros, Q. A. (2021). Effect of

- Pumpkin Flour Substitution (*Cucurbita moschata* L) on the Nutritional Value of Steamed Pumpkin Brownies on the Nutritional Value of Steamed Pumpkin Brownies. *ScientificInnovation*, 21(1), 18–21.
- Surahman, B., & Winarti, W. (2021). Analysis of the Effect of Taste on Customer Satisfaction HR Coffe SP. Four Bebesen. *White Elephant Journal of Economics Review*, 3(2), 26–45. <https://doi.org/10.55542/gpjer.v3i2.70>
- Widyastari, N. K. W. (2022). Substitution of wheat flour with yellow pumpkin flour (*Cucurbita moschata* durch) and mung bean flour (*Vigna radiate* L) for the organoleptic quality and nutritional content of cookies. In *Angewandte Chemie International Edition*, 6(11), 951–952. (Vol. 2).
- Wulandari, Nur Asyik, M. S. S. (2019). The effect of the addition of yellow pumpkin flour (*Cucurbita moschata* L) on organoleptic tests and nutritional value of steamed brownies as a high- β -carotene snack. 4(3), 2188–2203.
- Yuliastuti, E., Sulistyawati, E., Rismaya, R., Radiansyah, M. R., Nur, D., Fauziyah, A., Ulfah, M., Studi, P., Pangan, T., & Open, U. (2023). Increased knowledge and skills of Integrated Assisted Post Cadres (Pobindu) in the production of healthy based food. 256–268.
- Yuniari, N. (2023). Test the acceptability and protein and fiber content of steamed sponges with the addition of breadfruit flour and yellow pumpkin flour.
- Zaki, I., Wati, T. W., Kurniawati, T. F., Putri, W. P., & Khansa, I. (2022). A High-Fiber Diet Loses Weight in Obesity. *Journal of Nutrition and Culinary*, 2(2), 1. <https://doi.org/10.24114/jnc.v2i2.36756>
- Zatalini, N. T. (2021). Test the acceptability of steamed sponges with the addition of red bean flour and white oyster mushroom flour.

