Development of a gluten-free honey sweet potato flour premix as a functional baking alternative

Kezia Elsty [1]*, Evelin Cornelia [1], Berwyn Winata [1]

[1] *Pradita University, Indonesia*

**Corresponding author: kezia.elsty@pradita.ac.id*

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ABSTRACT

This research was done to develop the alternative of gluten-free snack as the functional food product by using sweet potato flour as a substitute for wheat flour. The purpose of this research is to explore the potential of sweet potatoes as local food ingredients that are nutritious and gluten-free, while completing the increasing request for healthy food and snacks. The research was done by combining literature study, kitchen lab experiment and respondent's evaluation. The research method is quantitative and is used to analyze the result achieved. The respondents were aged between 16 and 20 years. The respondents were requested to taste the gluten-free cookies alongside ranking them on a score that was based on some criteria that included aroma, colour, texture, taste and overall acceptance. Evaluation results showed that the product gets a positive result on every sensory parameter tested. This product has a good sensory quality that can be accepted while giving nutrition function, this supports the use of sweet potato flour as alternative to wheat flour as functional food.

1. INTRODUCTION

Indonesia is an archipelagic nation that extends from Sabang to Merauke. Indonesia is a vast country, which creates a variety of products and resources in the food industry (Yonathan et al., 2021; Sulistyo et al., 2024). Indonesia has a significant potential for food diversity. Many local food items are sources of carbohydrates including cereals (corn, sorghum, hotong, hanjeli, millet), tubers (cassava, sweet potato, taro, ganyong, arrowroot, gembili, gadung, suweg, porang, yam), starchy fruits (breadfruit, banana, pumpkin), and sago. But there has not been good use of these local food sources (Widowati, 2023).

Although sweet potatoes are mass produced in Indonesia, consumption remains relatively low (Anggara et al., 2026). There are several reasons why sweet potatoes are rarely consumed. One is the viewpoint from the locals that sweet potatoes are food for low-income people, making them less attractive to middle and upper-class consumers. Furthermore,

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young people are also considered to rarely consume sweet potatoes as part of their daily diet (Syafura & Rahmawati, 2021). Low interest in sweet potato consumption can lead to food waste. This is because high production levels are not matched by the consumption levels. As a result, some sweet potato harvests can be wasted due to low consumer demand. Moreover, sweet potatoes are typically only fried, boiled, or steamed (Aldi et al., 2024). This means that there is very little development of sweet potatoes in Indonesia into innovative food products.

On the production side, the Directorate General of Food Crops data indicates that in 2023, sweet potato will be produced at 1.43 million tons with a harvested area of 67.48 thousand hectares. This is a reduction of 80.70 thousand tons or 5.34% of production in 2022 which was 1.51 million tons. Nevertheless, the sweet potatoes are yet to be considered as a commodity that has high economic value in Indonesia. About 89% of sweet potato production is used to fulfil the community's needs of food, while the rest is used as industrial raw materials and animal feed. Sweet potato usage is still limited to traditional food products, which seem less attractive than flour-based products (Arianti & Harinta, 2021). This situation opens a big opportunity to process sweet potatoes into innovative and high valued products that can reduce food waste and strengthen national food security (Khusna et al., 2023).

Pastry products such as cookies have potential as innovative products that can combine flavor and nutritional value (Thejaya & Antonio, 2025). The popularity of cookies in Indonesia may also be reflected in the consumption rates of cookies, which accounted for 24.22% of total food consumption in the 20112015 years (Nandiyanto et al., 2022). As per the statistics provided by the Central Statistics Agency (BPS) (2020), the consumption of cookies in the localities was 2.28 kg/per capita/year. This number represents an increase of 17 percent over its trend in 2016, which was 1.94 kg per capita per year. Yuliandari et al. (2025) reported that cookies have a dense but crunchy texture that makes them popular with the different age groups, including children and adults. This indicates that cookies are well accepted by all ages.

Low sweet potato consumption has led to an oversupply (mass production), which can be processed into new, more beneficial products. High cookie consumption opens an opportunity to develop gluten-free cookies made from sweet honey potatoes. Sweet potatoes, rarely processed into other food products, can function as the main ingredient in cookies. This initiative will expand the interest of people in eating sweet potatoes. In addition to that, replacement of wheat flour with sweet potatoes could enhance the nutritional value of cookies.

As public awareness of health and food quality increases, functional food products are developing far by now (Hendra et al., 2021). Functional foods are seen as foods containing active components that provide biological and physiological benefits for the body (Khoerunisa, 2020; Sulistyo & Ramli, 2024). According to the Ministry of Agriculture of the Republic of Indonesia (2023), sweet potatoes are ingredients with a great potential for functional foods. The food technology professionals also support the diversification of sweet potato-based

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products. The high nutritional content of sweet potatoes makes them a good quality ingredient for the development of functional foods, especially in Indonesia.

The use of sweet potato flour as a substitute for wheat flour also allows to produce gluten-free products. Gluten is a type of protein found with starch and is usually found in wheat flour (Rayesa & Ali, 2022). Using sweet potato flour instead of wheat flour in cookie production, the new product will be gluten-free. The product is not made using other ingredients that contain gluten to ensure that it is gluten-free.

These gluten-free cookies also grow with the trend of gluten-free consumption in Indonesia. In 2022, various gluten-free products began to be introduced to the Indonesian market (Rayesa & Ali, 2022). Yuliandari et al. (2025) stated that in the past decade, the request for gluten-free products has increased not only among individuals with gluten intolerance, but also among people searching for a healthier lifestyle by avoiding foods containing gluten. With the growing interest in a gluten-free diet, many gluten-free products are now available in Indonesia, from raw ingredients to ready-to-eat (RTE) products and even premix flours.

The concept of premix products is becoming increasingly related in modern society. People tend to use premix products, mostly those who are busy and have a fast-paced lifestyle, particularly in urban settings. The speed of cities is associated with their high activity, large mass, high human density and increased stress (Permatasari et al., 2022). Jakarta, Bandung and Depok are examples of busy cities in Indonesia. Therefore, developing premix flour products is a good alternative. The main advantages of premix products is the ease of preparation and efficiency in ingredient selection and use.

2. LITERATURE REVIEW

Gluten-Free

In Indonesia, gluten free means food that lacks the contents of wheat or other cereals with gluten. Previously, a gluten-free diet was a diet recommended to patients with celiac disease. Celiac disease is an autoimmune disease which took place because of a sustained intolerance to the protein known as gluten. Celiac patients have a maladaptive immune reaction to gluten, and this damages the small intestine (Rayesa & Ali, 2022). There is no cure for this disease yet and thus the patients are obliged to avoid foods containing gluten.

Besides celiac patients, the general population is also adopting gluten-free diets to keep their health in check. Individuals who fail to adhere to this diet usually take wheat flour as a source of carbohydrates. Consumption of wheat flour in Indonesia is on a constant rise and is approximately 19.2 kg/capita/year. This has caused the importation of wheat to about 6 million tons annually (Finani & Putra, 2023).

Excessive intake of gluten may also lead to several health issues, including immune system issues, particularly when consumed by individuals with high body fat, obesity, fatigue,

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or eczema (Finani & Putra, 2023). Celiac disease occurs in approximately 1% of the global population (Doyle et al., 2025). Due to the high fat, sugar, and gluten diets, as well as gluten, in particular, gliadin as a component of gluten (Skoracka et al., 2023), the disease is more common in the Western world. The abnormal response of the immune system of the celiac patients to gluten leads to the destruction of the small intestine (Kowalski et al., 2025).

Nevertheless, it is not very common in countries where gluten intake is low, like in Indonesia, Korea, and the Philippines, as well as in some Pacific islands. A 2009 study of 819 patients with chronic diarrhea, only 5 patients (0.61) were diagnosed with celiac disease. According to the study, some of them lives on wheat every day, and others eat it only occasionally (Syam, 2024). Conversely, food products, especially gluten-free, are gaining popularity in Indonesia through health labels on food (Dwiamanta et al., 2024). The label is also becoming popular among the citizens. According to a study conducted by Rayesa & Ali (2022), 88 percent of 302 millennial customers in Java were aware of gluten-free products and half of them were aware of the same on social media. Most of the respondents also agreed that they have gluten-free foods to remain healthy.



Figure 1. Level of Knowledge about Gluten-Free Products
Source: Rayesa & Ali (2022)



Figure 2. Perception of Gluten-Free Products
Source: Rayesa & Ali (2022)

The gluten free consumption trend in Indonesia is still increasing due to some factors, one of them is the public awareness of healthy food lifestyles (Fantika et al., 2023). This thing

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is supported by the high percentage of respondents who agreed that gluten-free is useful for a healthy lifestyle as shown in the previous survey. This healthy lifestyle trend is popular especially among millennials (Rayesa & Ali, 2022). The same thing is also shown in the younger generation, Generation Z. From Luthfi et al. (2024), healthy food products like gluten-free, low sugar, and high fiber foods are attracted to Generation Z consumers.

Sweet Potato as Functional Food

Its large natural resources and population diversity are ranked 63rd of the 113 countries in the Global Food Security Index in Indonesia. This indicates that food security is yet to be improved, particularly on the sustainability fronts (Economist Impact, 2022). The Indonesian Food and Drug Authority (BPOM) defines functional food as processed food, which has one or more components that have undergone scientific validation to perform some physiological action other than simple nutritional action. One of the local food commodities in Indonesia but with high potential to be developed as a functional food ingredient is the sweet potato *(Ipomoea batatas L.)*. The orange flesh sweet potatoes contain high amounts of β-carotene, which is an antioxidant and a provitamin A (Yulia, 2022). Sweet potatoes are not only a source of energy but also provide other health benefits with these ingredients.

Two common varieties that are different in taste, color and functional potential are cilembu sweet potato (also called honey sweet potato) and purple sweet potato which are popular in Indonesia. Cilembu sweet potatoes, a variety of sweet potatoes grown in Sumedang, have been reported to be rich in natural sugar and when baked, release a honey-like liquid that gives them a sweet flavor resembling caramel. The nutritional value and antioxidant activity of this variety are approximately 44 g of carbohydrates, 3.4 g of dietary fiber, 0.03g of beta-carotene, flavonoids and carotenoids is found in 100g of its composition (Alodokter, 2024). Beyond that, honey sweet potato also has 8.509 mg/100 grams of vitamin A that helps in fulfilling vitamin A requirements and decreases insulin resistance. This type of sweet potato also tastes sweet naturally and has 46 mg/100 g calcium, 0.08 mg vitamin B1, 0.5 mg vitamin B2, 0.9 mg niacin and 20 mg/100 g vitamin C (Maxiselly et al., 2024).

In the meantime, purple sweet potatoes are also characterized by a great amount of anthocyanin that predisposes the deep purple color and the strong antioxidation. Such distinctions in features render each type possessing its own pros and personality. Honey sweet potatoes are natural sweeteners and add richness to the flavor of the product, whereas purple sweet potatoes add aesthetic value and extra health value. Hence, these two types can be used effectively in the production of new products like functional cookie premixes.

Moreover, the glycemic index of sweet potatoes is lower than processed carbohydrates like wheat flour hence they can stabilize blood sugar levels. Such a combination of nutritional content aids in creating healthier functional food products (Yulia, 2022). The sweet potatoes

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are also gluten-free in nature and thus are an ideal substitute to gluten-free diet or an individual who are intolerant of wheat protein (Puspitasari & Kok, 2023). It is with these diverse applications that sweet potatoes can be used effectively as a fundamental ingredient in the formulation of contemporary functional food products, including cookie premixes, which are a blend of taste, nutritional value and sustainability.

Efficiency of Premix Flour Products in Indonesia

The consumption of pre-mix flour is gaining popularity in Indonesia, particularly in towns. It is a product that is regarded as a time and energy saving product. Premix flour serves to make the production process easier, since it already includes a ready-to-use combination of dry ingredients. All users have to do is pour in liquid ingredients, e.g., water, eggs, or oil, and then bake (PRB Indonesia, 2023). This will remove the necessity of weighing or buying large amounts of dry ingredients individually. Premixes save time and energy as compared to the traditional approach to making the product. Compared to the traditional method, using premixes saves a lot of time and energy to make the product.

The report by PT Kaffah Sentral Indonesia (2023) explains that premix flour can be used to speed up the production process without affecting the quality of the products. Thus, pre-mixed flour can be applied to small-scale businesses and domestic consumption, particularly in big towns where people do not have enough time. Bungasari Flour Mills Indonesia (2022) also adds that premix products assist consumers to make a variety of bakery products with a reliable number of results and flavor. This is in line with the hectic schedules of the urban cities such as Jakarta and Bandung that demand convenient but healthy food.

ATI Makassar Polytechnic indicates that surimi-based premix flour is very efficient in that it can shorten the time needed in production. The IRR of this product is also economically viable at 136% (Riskawati et al., 2022). These findings demonstrated that not only can the urban consumers be offered the premix flour innovation, but also the small and medium-sized food enterprises have a huge potential of being more productive due to the innovation. According to this description, the conclusion can be made that premix flour is an efficient and practical product and could be used in food processing in everyday life.

3. METHODOLOGY

The research methods applied in the study would be experimental using non-randomized studies for intervention. There will be 1 control and 3 non-randomized interventions from the amount of self-made honey sweet potato flour to make the honey sweet potato premix, in an interval of 25 g of each intervention, 75, 100 and 125 g per recipe for each intervention. Then the process continues to the stage of organoleptic test using a semi-trained panelist of 30 people to test control and the 3 non-randomized intervention samples of

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gluten-free sweet potato cookies using the honey sweet potato premix. The organoleptic test will cover the taste, smell, texture, color and overall senses toward each sample.

Besides, for the secondary studies, literature review is conducted to find the previous studies of similar topics and the based theory for developing the premix recipe in this research. The based on developing the premix recipes are the use of 100% sweet potato flour is not recommended, as it may result in suboptimal texture and sensory characteristic, as the mix for dry ingredients, other gluten-free flours commonly used in cookie production include cornstarch, rice flour, and sago flour, mocaf (Modified Cassava Flour), and the dehydrating process of flour at an appropriate temperature can enhance cookie flavor and produce a lighter, crispier texture. The result of the experiment will be presented descriptively showing the meaning of the test through an organoleptic test toward the semi-trained panelists.

Based on the above explanation, the formulation of the Sweet Potato Premix Cookie recipe is presented as follows:

Table 1. List of Ingredients for Original Sweet Potato Cookie Premix

Ingredients	Intervention 1		Intervention 2		Intervention 3	
	Quantity	Unit	Quantity	Unit	Quantity	Unit
Sweet Potato Flour	75	gr	100	gr	125	gr
Mocaf Flour	75	gr	75	gr	75	gr
Cornstarch	37.5	gr	37.5	gr	37.5	gr
Icing Sugar	35	gr	35	gr	35	gr
Milk Powder	10	gr	10	gr	10	gr
Baking Powder	2.5	gr	2.5	gr	2.5	gr
Fine Salt	1.25	gr	1.25	gr	1.25	gr

The steps for making sweet potato flour are as follows:

1. Peel and grate the sweet potatoes. You can also squeeze the grated sweet potatoes to remove excess water so the drying process can be faster (optional).



Figure 3. Grated Sweet Potato

2. Spread the grated sweet potatoes evenly on a drying tray (dehydrator) lined with baking paper to prevent sticking.

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Figure 4. Grated Sweet Potatoes on the Drying Tray Liner

3. Dry the sweet potatoes for 8 hours at 60°C, make sure that all the parts are completely dry before proceeding to the next step.



Figure 5. Fully Dried Grated Sweet Potato

4. Grind the dried sweet potatoes, then sift until a fine flour texture is achieved.



Figure 6. Sweet Potato Flour

The steps for making gluten free sweet potato premix:

1. Weigh all the ingredients.

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Figure 7. Ingredients for Original Flavor Sweet Potato Premix Cookies

2. Mix all the ingredients together.



Figure 8. Original Flavor Sweet Potato Premix Powder

3. Store in airtight packaging.



Figure 9. Premix Powder in Vacuum Packaging

Table 2. List of Additional Ingredients for Making Cookies (Calculation per 250 g)

Ingredients	Quantity	Unit
Butter	100	gr
Egg Yolk	20	gr

Gluten free sweet potato cookies directions:

1. Combine the butter and yolks of the egg in a bowl. Blend until combined and smooth (do not overmix).
2. Pour in the sweet potato cookie premix, and mix using a spatula until the mixture forms a soft dough that can be easily moulded and use toppings of your choice.
3. Take a piece of the dough, roll it into a ball, and flatten it slightly, then lay it on a piece of

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baking paper.

4. Bake in a pre-heated oven at 160C, and bake for 20-25 minutes, or until the bottom of the cookies turns a golden brown.
5. Bake and allow cookies to cool on a wire rack before placing it in an airtight container.
6. All the gluten-free sweet potato cookies are prepared and ready to serve and enjoy.

Ingredients Percentage

The following is a diagram showing the percentage of ingredients content in the sweet potato cookie premix:

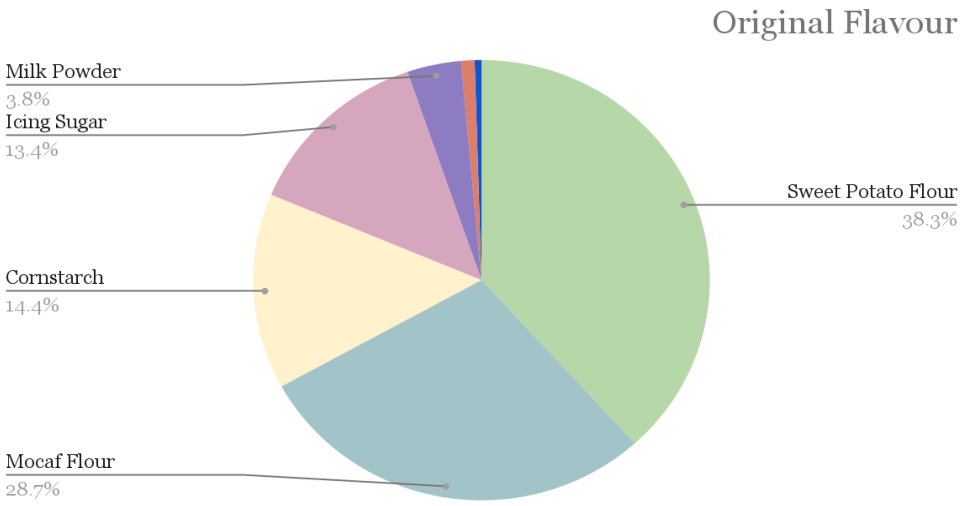


Figure 10. Percentage Diagram of Original Flavor Premix Ingredients

Research Trials

The author did several tests and trials in the kitchen lab. According to the main recipe formulation, it was established that the recipe and standards were adhered to the letter, and the dough was too dry and hard to mould. The baked cookies were also likely to become excessively crumbly and dry with that consistency and texture.



Figure 11. Dry Cookie Dough

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To solve this issue, the author decided to increase the amount of butter and egg yolk. The function of this adjustment is to raise the percentage of wet ingredients so that the dough could achieve a better consistency and texture. The dough that contained extra wet materials gave the dough a better shape, and gave better results upon baking. The extra weight used was 20 g of butter and 20 g of egg yolk per serving (120 g of butter and 40g of egg yolk).



Figure 12. The Right Dough Consistency

The following section presents the results of the product developed based on the steps described earlier.



Figure 13. Sweet Potato Cookie Result

4. RESULTS AND DISCUSSION

About the Product

The product can be developed in the form of a premix to improve its efficiency and consistency in preparation. A premix formulation allows the dry ingredients to be pre-measured and blended in a controlled proportion, which helps maintain product quality during preparation. This premix also reduces differences that may occur when consumers measure dry ingredients individually, making sure more consistent results in forms of texture, flavor, and overall product characteristics. From a product development perspective, making the formulation into a premix format also supports better shelf stability and storage management, as the ingredients can be packaged in a controlled in right environment to maintain safety and quality over time.

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Product Sketch

The following sketch illustrates an example of packaging design for the premix product. This design concept may be used as a reference for future marketing and sales purposes.



Figure 14. Estimated Sketch of the Original Flavor Cookie Box

Discussion

The results of the organoleptic test indicate that the formulation using 100 g of honey sweet potato flour received better responses from the respondents compared to the other interventions. Many respondents gave higher scores for the factors which are taste, aroma, texture, and overall acceptance. This suggests that the 100 g formulation provides a better result for the premix cookie recipe. In comparison, the lower and higher quantities of honey sweet potato flour produced slightly different sensory characteristics, which may have influenced the level of preference from the respondents.

Table 3. Average Respondent Scores

Product	Taste	Aroma	Color	Texture	Overall
Original Gluten-Free Cookie Recipe (528)	3.01	3.27	3.30	3.10	3.21
75 gr Honey Sweet Potato Flour Recipe (281)	2.94	3.13	3.16	3.05	2.92
100 gr Honey Sweet Potato Flour Recipe (625)	3.00	3.00	3.29	3.11	3.10
125 gr Honey Sweet Potato Flour Recipe (107)	2.76	2.85	2.25	2.62	2.86

The results of the sensory evaluation show that each formulation produced different average scores across the score of taste, aroma, color, texture, and overall. The overall average score of the gluten-free cookie recipe (528) control recipe was the highest at 3.21. In the meantime, the 100 g of honey sweet potato flour (625) formulation obtained an average total of 3.10, which is not very different to the control sample. Meanwhile, the recipes that used 75 g (281) and 125 g (107) of honey sweet potato flour scored lowly with an overall score of

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2.92 and 2.86. These findings suggest that the quantity of honey sweet potato flour applied in the formulation can affect the sensory properties of the end product.

The greater amount of honey sweet potato flour used in the recipe is what helps to make the cookie have a texture. These variations have to do with the moisture and dry content in the cookie dough. The dough made with the 75 g of honey sweet potato flour might have been of a relatively higher moisture and, thus, the cookies were rather wet and softer after they were baked. Conversely, the formula with 125 g of Honey sweet potato flour could have raised the proportion of dry components and resulted in a drier and firmer cookie, the cookie will be more orange colored and the aroma of the sweet potato will be more apparent. Comparatively, the 100 g formulation seems to give a more balanced mixture of moisture and structure, leading to the characteristics that are more similar to the original recipe.

The sweet potato cookie premix is formulated to give a functional snack made for everyone who seeks for functional food. The functional cookie could be made by adding the fat (could be butter or margarine) and egg yolk then mix and continue the process by baking it. This functional cookie becomes the alternative snack for people who are gluten intolerant, chronic disease related to gluten consumption such as Crohn or colitis and people who seek for healthier snacking. Besides consuming functional snacks like gluten free honey sweet potato cookies, consumers will get additional nutrition such as vitamin A, vitamin B-1, vitamin B-2, niacin and vitamin C.

5. CONCLUSION

This study indicates that sweet potatoes can be a very good functional food ingredient. These substances add to the antioxidant and anti-inflammatory properties. Moreover, sweet potatoes are inherently gluten-free, and their glycemic index is relatively lower, so they are an ideal fit to healthy and gluten-free diets. The development and experimentation of sweet potato-derived premix cookie flour were underway by substituting wheat flour with sweet potato flour and conducting kitchen tests to enhance sensory properties of the product, such as taste, texture, aroma, and appearance. The findings demonstrated that sweet potato flour can be used with other local flours to enhance the texture of the product and enhance the acceptance of the product by the consumers. Moreover, the concept of premix products was efficient and viable due to the saving of preparation time, the consistency of product quality and the ability to meet the demands of consumers in an urban setting with fast and hectic lives.

The findings of this research, in general, suggest the possibility of using sweet potato flour as a primary ingredient of pre-mix cookies. The analysis reveals that the taste, aroma, color, and texture of the final product are affected by different flour compositions. Out of the test formulations, the sample that had a 100-gr percentage of sweet potato flour usually scored

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higher among respondents. This implies that sweet potato flour does not only add nutritional benefit to the product but also the overall sensory acceptability of the cookies.

Suggestion

For future product development, it is suggested to do other flavor variations of the premix cookies to increase consumer interest.Aside from the original flavor, one other flavor that can be developed further due to the popularity of the chocolate taste among many consumers is chocolate flavor itself. It is known for its strong and distinctive taste, which would serve well to complement the original flavor of the sweet potato. At the same time, the distinctive taste of the chocolate will cover up the earthy taste that some consumers do not appreciate. With this flavor, it will be possible to attract consumers seeking something sweeter but with the nutritious components of sweet potato flour.

Another possible flavor that can be developed in the future is the matcha flavor. Matcha flavor has been gaining increasing popularity among different kinds of desserts and snacks owing to its distinct taste and smell. This distinct feature of the matcha, as well as its slightly bitter taste, can help make for a well-balanced combination of the flavors of the sweet potato and the matcha. Moreover, matcha flavoring also adds an extra health benefit to the product, contributing to the functional food status of the product.

6. REFERENCES

Aldi, M. A. A., Fahruddin, M. N., Suandi, M. R., Musthofa, N. L., Larasati, N., Kinanti, P., Aghia S., Q. N., Az-zahra, R. P., Putri, S. A., Azaria J., S., & Hastuti, A. (2024). Pendampingan inovasi kuliner sistik ubi jalar di Desa Cipicung: Kolaborasi pendidikan, kesehatan, dan sosial masyarakat. *Satwika: Jurnal Pengabdian Kepada Masyarakat, 4*(2), 116–127. https://doi.org/10.21009/satwika.040205

Alodokter. (2024, December 18). *Ubi madu, inilah nutrisi dan manfaatnya bagi kesehatan*. Alodokter.

Anggara, J. R., Tambayong, S. G., Wibowo, E. K., & Suniati, F. R. T. (2026). Color and aroma changes in potato and chicken meat due to maillard reaction during roasting. *Journal of Tourism, Culinary, and Entrepreneurship (JTCE)*, *6*(1), 93–104. https://doi.org/10.37715/jtce.v6i1.5925

Arianti, Y. S., & Harinta, Y. W. (2021). Sweet potatoes: Development and potential as alternative food ingredients in Karanganyar Regency, Indonesia. *E3S Web of Conferences, 226*, Article 00050. https://doi.org/10.1051/e3sconf/202122600050

Bungasari Flour Mills Indonesia. (2022). *Sambut Ramadan, Bungasari tampilkan sajian praktis gunakan tepung premix*. https://bungasari.com/sambut-ramadan-bungasari-tampilkan-sajian-praktis-gunakan-tepung-premix-4171

Dwiamanta, F. A., Nasution, G. H. U., Kamil, R. Z., Putra, H. B. P., & Sa'adah, A. A. (2024). Penerapan konsep *innopreneurship* melalui pengolahan beras merah menjadi produk premiks cookies bebas gluten. *Jurnal Gembira: Pengabdian Kepada Masyarakat, 2*(6), 2352–2359.

Doyle, J. B., Silvester, J., Ludvigsson, J. F., & Lebwohl, B. (2025). Advances in the pathophysiology, diagnosis, and management of celiac disease. *BMJ, 391*, e081353. https://doi.org/10.1136/bmj-2024-081353

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Economist Impact. (2022). *Global Food Security Index 2022*. https://impact.economist.com/sustainability/project/food-security-index/

Fantika, R. R., Sutanto, J. E., Soediro, M., & Oktavio, A. (2023). The influence of product quality, service quality, and location on customer loyalty at Depot Wakik Gresik. *International Journal of Economics, Business and Accounting Research (IJEBAR), 7*(2), 537–544. https://doi.org/10.29040/ijebar.v7i2.8835

Finani, N. I., & Putra, A. Y. T. (2023). Sosialisasi makanan bebas gluten sebagai pengganti tepung terigu untuk pencegahan diabetes dan overweight di Kampung Bulak Cumpat Srono, Surabaya. *Jurnal Pengabdian Masyarakat Inovasi Indonesia, 1*(1), 35–40. https://doi.org/10.54082/jpmii.264

Hendra, H., Wahyuningputri, R. A., Putra, A. N., & Levyta, F. (2021). The lexicon of Majapahit culinary at Trowulan in the globalization era. *Journal of Tourism, Culinary, and Entrepreneurship (JTCE), 1*(2), 208–218. https://doi.org/10.37715/jtce.v1i2.2271

Khoerunisa, T. K. (2020). Review: Pengembangan produk pangan fungsional di Indonesia berbasis bahan pangan lokal unggulan. *Indonesian Journal of Agricultural and Food Research, 2*(1).

Khusna, R. N. B., Lestari, L. A., & Supriyati, S. (2023). Persepsi dan pengetahuan ibu terhadap pangan fungsional di Indonesia. *Jurnal Gizi dan Kesehatan Indonesia, 19*(3), 128–138.

Kowalski, M. K., Domżał-Magrowska, D., & Małecka-Wojciesko, E. (2025). Evaluation of the frequency of HLA-DQ2/DQ8 genes among patients with celiac disease and those on a gluten-free diet. *Foods, 14*(2), Article 298. https://doi.org/10.3390/foods14020298

Luthfi, T. F., Novianti, S., Sanggramasari, S., Duhita, N., Septian, A. R., Eleanora, C., & Alistiawati, A. (2025). Persepsi dan faktor penentu pemilihan produk pastry dan bakery sehat pada generasi Z: Studi kasus kuantitatif di Indonesia. *Jurnal SAGO Gizi dan Kesehatan, 6*(2), 309–317.

Maxiselly, Y., Ridwan, K. A. I., Khamaliyah, S. D., Sitanggang, A. L., Hanan, H., Nurmahmudin, A., Nur, M. R., Anindya, N., Sevia, D. A., Simanjuntak, G. P. N., Sukarno, C. F., & Fauzzan, C. I. (2024). Ubi Cilembu mashed: Penguatan ketahanan pangan dengan inovasi produk Ubi Cilembu pada masyarakat Desa Cileles. *Agrikultura Masyarakat Tani, 2*(1), 35–41. https://doi.org/10.24198/agrimasta.v2i1.59773

Nandiyanto, A. B. D., Ragadhita, R., Ana, A., & Hammouti, B. (2022). Effect of starch, lipid, and protein components in flour on the physical and mechanical properties of Indonesian biji ketapang cookies. *International Journal of Technology, 13*(2), 432–443.

Permatasari, I., Baswara, B., & Adira, N. (2022). Comparing the pace of life of a city: Size and average temperature as predictors. *Psychological Research and Intervention, 5*(1), 28–36.

PRB Indonesia. (2023, July 22). *Tepung premix: Solusi praktis dan hemat untuk membuat kue*. PRB Indonesia News Portal.

PT Kaffah Sentral Indonesia. (2023). *Tentang kami*. Kaffahmix Official.

Puspitasari, E. D., & Kok, T. (2025). Nutritional and sensory profile of conventional, gluten-free, and plant-based cookies. *Keluwih: Jurnal Kesehatan dan Kedokteran, 7*(1).

Rayesa, N., & Ali, D. Y. (2022). Sikap konsumen milenial terhadap produk berlabel gluten-free. *Jurnal Ekonomi Pertanian dan Agribisnis, 6*(4), 1684–1695.

Riskawati, Tawali, A. B., & Dirpan, A. (2022). Scale up produksi tepung premix otak-otak berbasis surimi pada usaha kecil. *Journal of Agro-industry Engineering Research, 1*(1), 36–42. https://doi.org/10.61844/jaier.v1i1.144

Skoracka, K., Hryhorowicz, S., Rychter, A. M., Ratajczak, A. E., Szymczak-Tomczak, A., Zawada, A., Słomski, R., Dobrowolska, A., & Krela-Kaźmierczak, I. (2023). Why are western diet and western lifestyle pro-inflammatory risk factors of celiac disease? *Frontiers in Nutrition, 9*, Article 1054089. https://doi.org/10.3389/fnut.2022.1054089

Sulistyo, J., Dewi, I. C., & Oktavio, A. (2024). Pelatihan pengembangan inovasi bioaktivator untuk meningkatkan kualitas pangan organik berbasis sistem pertanian organik. *I-Com: Indonesian Community Journal, 4*(2), 773–780. https://doi.org/10.33379/icom.v4i2.4335

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Sulistyo, J., & Ramli, A. M. (2024). Characterization of virgin coconut oil fermented using starter culture prepared with probiotic bacterial strain. *Journal of Tourism, Culinary, and Entrepreneurship (JTCE)*, *4*(1), 63–76. https://doi.org/10.37715/jtce.v4i1.4635

Syafura, A. N., & Rahmawati, F. (2021). Substitusi puree ubi jalar kuning (*Ipomoea batatas* L.) dalam pembuatan kulit taco ubi kuning dengan isian ikan nila crispy sambal dabu-dabu. *Prosiding Pendidikan Teknik Boga Busana, 16*(1).

Syam, A. F., Utari, A. P., Hasanah, N. H., Rizky, A., & Abdullah, M. (2024). Prevalence and factors associated with celiac disease in high-risk patients with functional gastrointestinal disorders. *PLOS ONE, 19*(6), e0297605. https://doi.org/10.1371/journal.pone.0297605

Thejaya, G., & Antonio, T. (2025). The role of consumer satisfaction in mediating product quality and online service quality on repeat product purchase decisions. *Journal of Tourism, Culinary, and Entrepreneurship (JTCE)*, *5*(1), 189–199. https://doi.org/10.37715/jtce.v5i1.5597

Widowati, S. (2023). Prospek pemanfaatan pangan lokal dalam rangka meningkatkan ketahanan pangan. In S. Widowati & R. A. Nurfitriani (Eds.), *Diversifikasi pangan lokal untuk ketahanan pangan: Perspektif ekonomi, sosial, dan budaya* (pp. 1–13). Penerbit BRIN. https://doi.org/10.55981/brin.918.c789

Yonathan, C. J., Ristam, Y. P. G., Wijaya, V. A., & Krisbianto, O. (2021). Focus group discussion and quantitative sensory analysis to identify sensory parameters of new food product. *Journal of Tourism, Culinary, and Entrepreneurship (JTCE), 1*(1), 61–78. https://doi.org/10.37715/jtce.v1i1.1800

Yulia, N. (2022). Pemanfaatan ubi jalar oranye (*Ipomoea batatas* L.) dalam pembuatan minuman probiotik sebagai pangan fungsional. *Journal of Pharmacopolium, 5*(1).

Yuliandari, T., Romadhoni, I. F., Sutiadiningsih, A., & Miranti, M. G. (2025). Inovasi cheese cookies gluten free dengan coating gula palm menggunakan tepung mocaf dan pati garut. *Journal Sains Student Research, 3*(6), 216–230.

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