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Development Of Gluten Free Moringa Choux Paste As A Culinary Tourism Product

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ABSTRACT

The culinary industry is growing rapidly in Indonesia. Indonesian people are now aware of the importance of diet to meet the nutritional needs of the body so that it shows the potential of functional culinary. Functional foods can be developed in patisserie products, one of which is choux paste. The purpose of this research in general is to develop a gluten-free choux pasta recipe formulation with the addition of Moringa leaf flour as a culinary tourism product. Moringa leaf flour was added in a ratio of 4g (A1), 6g (A2), 8g (3), this test used a Likert scale with 30 consumer panelists in Kiaracondong and Pangalengan participating in this study by filling out a questionnaire. The results showed that the formula with the addition of 6g of Moringa leaf flour was the formula with the highest acceptability and the most preferred color by the panelists, so it is highly recommended.

Keywords: Choux Paste, Moringa leaf flour,gluten-freee, acceptability, Culinary tourism products

ABSTRAK

Industri kuliner berkembang pesat di Indonesia. Masyarakat Indonesia kini sadar akan pentingnya diet untuk memenuhi kebutuhan gizi tubuh sehingga menunjukkan potensi kuliner fungsional. Pangan fungsional dapat dikembangkan dalam produk patisserie, salah satunya choux paste. Tujuan penelitian ini secara umum adalah mengembangkan formulasi resep choux pasta bebas gluten dengan penambahan tepung daun kelor sebagai produk wisata kuliner. Tepung daun kelor ditambahkan dengan perbandingan 4g (A1), 6g (A2), 8g (3), pengujian ini menggunakan skala Likert dengan 30 panelis konsumen di Kiaracondong dan Pangalengan berpartisipasi dalam penelitian ini dengan mengisi kuesioner. Hasil penelitian menunjukkan bahwa formula dengan penambahan 6g tepung daun kelor merupakan formula dengan daya terima tertinggi dan warna yang paling disukai oleh panelis sehingga sangat direkomendasikan.

Kata kunci: Choux Paste, tepung daun kelor, bebas gluten, akseptabilitas, produk wisata kuliner

1.INTRODUCTION

One of the industries in Indonesia that is moving very fast in its development is the food/culinary industry. People's consumption patterns at this time have begun to change, at this time people are

starting to realize that food is not just for daily needs but for fulfilling nutrition to maintain body health. In this case, the Indonesian people are starting to realize the importance of eating patterns to meet the needs of the body in accordance with the body so that it shows the potential of functional food/culinary. Functional food can be developed in the product of patisserie. Pastry products are very popular with the people of Indonesia. This is because Indonesian people like to be pampered with beautiful visual pastry and a combination of flavors that are not too sweet but rather savory like choux paste.

According to Ratnasari.,(2014) choux paste is defined as a type of pastry with a large volume but has light characteristics. Choux paste in Indonesia is often referred to as eclairs. This eclairs has a soft textured appearance and hollow inside, so that fla or filling of various flavors can be filled in it.

Gluten is a natural protein which can be found in graminae groups such as wheat, oats, and barley. In this case to make eclairs, wheat flour can be replaced with gluten-free flour (gluten-free). Non-gluten flours that are often found in the market include tapioca flour and rice flour. So that through gluten-free eclairs or gluten-free choux paste, it helps people who love sweet foods to undergo a low-gluten diet in order to maintain and improve the quality of digestive health. By selling gluten-free products, it can expand the target market of consumers who can consume gluten for those who cannot consume gluten.

Anwar et al, (2007) explained that moringa oleifera or commonly called Moringa leaves is one of the many plants in which it contains a lot of fiber and complete vitamins. In Indonesia, Moringa plants are widely planted, this is because the Moringa plant is known as a nutritious medicinal food by utilizing all parts of the plant such as leaves, bark, seeds to roots (Simbolan et al, 2007). However, the use of Moringa leaves is still minimal and there are not many innovations, generally Moringa leaves are only known as one of the food menus such as vegetables and medicine. Because of that, to increase economic value, Moringa leaves are processed into processed cake products that consumers like, such as choux paste.

The city of Bandung is one of the main attractions for culinary tourism in Indonesia. At this time Bandung is known as a culinary center tourist area. The modern culinary wealth of the Bandung area has begun to spread. One of the most popular culinary tourism products in the world is coux paste which is a dessert or snack. Choux Paste innovation as a culinary tourism product in the city of Bandung has begun to be developed. In developing a business there are several things that need to be considered because they can have a major impact on the competitiveness of a product, one of which is packaging (Klimchuk & Krasovec, 2012; Szaky, 2018; Wahyudi & Satriyono, 2017).

Packaging is a protection or container used for an item that serves to maintain the quality of a product. According to Kotler and Keller.,(2012), packaging is also defined as a business built to maintain brand equity so that it can break sales. Food packaging design has become a key component of companies' marketing mix to ensure the long-term success of their products, and to convey information that differentiates their products from competitors (Gastón Ares et al, 2022). The role of food packaging has largely evolved throughout history, beyond its basic functions related to containment, protection and convenience (Pal et al, 2019).

The purpose of this research in general is to develop a recipe formulation of Free gluten moringa Choux Paste as a culinary tourism product. The specific objectives of this study were 1) to determine the recipe for gluten free moringa choux paste 2) to determine the acceptability of the free gluten free moringa choux paste as a culinary tourism product. 3) To develop the packaging design of Free gluten moringa Choux Paste in order to increase the attractiveness and marketability of the product.

Through the innovation of gluten free choux paste with the addition of Moringa leaf flour, it is hoped that it can be a breakthrough to positive things in the bakery industry which in turn has the potential to be processed for culinary tourism, especially in the city of Bandung. With the rise of cake or cake innovations that not only highlight a unique taste and attractive shape, but also with a better cake composition and are able to encourage the bakery industry in Indonesia, especially the city of Bandung, to experience significant development.

2. METHOD

The research method used in this study is an experimental method, namely a direct experiment on the manufacture of choux which is added with Moringa leaf flour in its manufacture. The tools used in this study were bowls, pans, ovens, scales stoves, teaspoons, tablespoons, sieves, measuring cups, spatulas, baking sheets, piping bags, syringes, scissors. The ingredients needed in making choux paste are rice flour, glutinous rice flour, moringa leaf flour, vanilla, eggs, margarine, salt, water, baking powder.

The procedure of this research begins with the preparation stage of making choux paste/gluten-free eclairs with the addition of Moringa leaves. In the material preparation stage, namely the selection of quality ingredients and weighing the ingredients according to the reference recipe and preparing organoleptic tests in the form of a questionnaire (scale scoring) and semi-trained panelists to test the characteristics of choux paste/gluten-free eclairs with the addition of Moringa leaves. Furthermore, at the implementation stage, the process of making this choux begins with boiling water (300ml), salt, margarine (100g) until it boils then add glutinous rice flour (25g) and rice flour (150g) then stir on low heat until well mixed. Cool the dough until it is lukewarm then add the eggs (150g), Moringa leaf flour (4g, 6g, 8g) and baking soda (1g) then mix thoroughly using a mixer. After everything is done, print the eclairs dough on the baking sheet and then place the pieces of craquelin dough on top of the choux and bake at 170℃ for 25 minutes with the addition of Moringa leaf flour formulations contained in table 1. The last step is to wait for the choux that has been cooked then give the filling and the choux is ready to be served.

The variables observed in this study were acceptability tests using hedonic tests on texture, aroma, taste, color.

Table 1. Formula for Adding Moringa Leaf Flour to Gluten Free Moringa Choux Paste

Ingredient Choux skin (30 pcs)	**Basic Recipe**	**Treatment**		
		A1 4 g	**A2 6 g**	**A3 8 g**
Rice flour	150 g	150g	150 g	150 g
Glutinous rice flour	25 g	25 g	25 g	25 g
Moringa Leaf Flour	-	4 g	6 g	8 g
Vanilla	1/2 g	1/2 g	1/2 g	1/2 g
Egg	150 g	150 g	150 g	150 g
Margarine	100 g	100 g	100 g	100 g
Salt	¼ g	¼ g	¼ g	¼ g
Water	300 ml	300 ml	300 ml	300 ml
Baking Powder	1 g	1 g	1 g	1 g

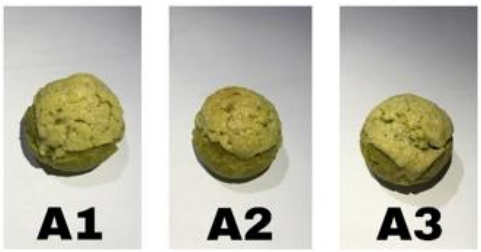
After the innovation process of making gluten free choux paste / eclairs with the addition of Moringa leaves is carried out, then in developing this gluten free moringa choux paste business there are several things that need to be considered because they can have a big impact on the competitiveness of a product, one of which is packaging.

The packaging design uses the method of data collected from sources obtained from various theories that can be used as the basis for research. The data that became the basis of the research included data on packaging theory, packaging functions, references to types and forms of packaging in food. Determining packaging design ideas and concepts from the data that forms the basis of research then collected and processed into new concept designs in creating creative ideas regarding packaging design .

3. RESULT AND DISCUSSION

The hedonic test was conducted in Kiaracondong and Pangalengan with a total of 30 consumer panelists. The samples tested were 3 Gluten Free Choux au Craquelin products with sample code A1 (Gluten Free Choux au Craquelin with 4g Moringa flour composition), A2 Gluten Free Choux au Craquelin with 6g Moringa flour composition and A3 samples (Gluten Free Choux au Craquelin). Craquelin with 8g Moringa flour composition). The results of product trials are then evaluated to get the right basic formula. The results of the hedonic test can be seen in Figure 1

Figure 1. Gluten Free Choux



Paste Experiment Final Results

At the conclusion of the acceptability test or hedonic test carried out by the panelists, it was found that the Gluten Free Moringa Choux Paste formulation made from 150 grams of rice flour, 25 grams of glutinous rice flour with formulation A2 or 6 grams of Moringa leaf flour were the most preferred formulations by the panelists. of 4 indicators, namely aroma, color, taste, and texture. The results of Gluten Free Moringa Choux Paste 6 gram Moringa leaf flour formulation (A2) can be seen in Figure 2

Figure 2. Results of Gluten Free Moringa Choux Paste 6 gram Moringa leaf flour formulation (A2)

Thus, based on consumer acceptance, this formulation is the most recommended formulation for production. The results of the experiment using a reference recipe in terms of color on Coux Paste are yellow, aroma, taste and texture like coux paste in general, so this reference recipe can be innovated by adding Moringa leaf flour to the manufacture of coux paste. Based on the results of the hedonic coux paste test, the average color indicator value is 4.50 (Very Like), Aroma 4.43 (Very Like), Taste 4.40 (Very Like) and Texture 4.37 (Very Like). Observation results can be seen in the table 2.

Table 2. Hedonic Test Results on Gluten Free Moringa Choux Paste

Aspec	Gluten free Choux with Moringa leaf flour 4g (A1)	Gluten free Choux with Moringa leaf flour 6g (A2)	Gluten free Choux with Moringa leaf flour 8g (A3)

	n	%	n	%	n	%
	0	0	0	0	0	0
	0	0	0	0	0	0
Score	0	0	1	3,33	12	40
	20	66,67	10	33,33	12	40
	10	33,33	19	63,33	6	20
Participant (n)	30	100	30	100	30	100
Total score	130		136		114	
Mean (Average)	4,33		4,60		3,80	

Information : n = Number of Panelists, % = Number of panelists in percent

After doing further research, the results showed that the panelists most liked the A2 product with the addition of 6g of Moringa leaf flour with an average value of (4.60) which in the hedonic quality test got the highest average value on the A2 product. That is, the panelists judged that product A2 was the product with the best formula.

Table 3. Hedonic Test Results of Color Indicators on gluten-free choux

Aspec	Color Aspect Gluten Free Choux					
	***Gluten free Choux* with Moringa leaf flour 4g (A1)**		***Gluten free Choux* with Moringa leaf flour 6g (A2)**		***Gluten free Choux* with Moringa leaf flour 8g (A3)**	
	N	%	n	%	n	%
	0	0	0	0	0	0
	0	0	0	0	0	0
Score	0	0	1	3,33	12	40
	20	66,67	10	33,33	12	40
	10	33,33	19	63,33	6	20
Participant (n)	30	100	30	100	30	100
Total Score	130		136		114	
Mean (Average)	4,33		4,60		3,80	

The results of product trials using a reference recipe in terms of the color of Choux Paste, which is golden yellow in Choux Paste in general. So that it can be applied with the addition of Moringa leaves in the manufacture of Choux Paste (eclairs).

Color in food has a major role in the appearance of food, even though the food tastes delicious if the color of the food is not attractive when served it will result in loss of appetite (Putri, 2009). Based on the results of the acceptance test on 30 consumer panelists contained in table 3 for the Gluten Free Choux color with 4g (A1) Moringa leaf flour, the mean obtained is 4.33, which means that the Gluten Free Choux color is included in the criteria of being highly favored. for the Gluten Free Choux color with 6g (A2) Moringa leaf flour, the mean obtained is 4.60, which means that the Gluten Free Choux color is included in the criteria of being highly favored. for the Gluten Free Choux color with 8g (A3) Moringa leaf flour, the mean obtained is 3.80, which means that the Gluten Free Choux color is included in the preferred criteria. In the product quality test, the mean or the highest average value is the A2 product. That is, the panelists considered that the product with the addition of 6g of Moringa

leaf flour (A2) was an attractive product in terms of color.

Research conducted by Widyaningrum.,(2018) states that the more addition of Moringa leaves to the dough, the more color will be produced. With the addition of 6g of Moringa leaf flour, the color results are not too thick so that it becomes the product with the most preferred color by the panelist.

Table 4. Hedonic Test Results of Scent Indicators on gluten-free choux

Aspec	Aspects scent of the Gluten Free Choux					
	***Gluten free Choux* with Moringa leaf flour 4g (A1)**		***Gluten free Choux* with Moringa leaf flour 6g (A2)**		***Gluten free Choux* with Moringa leaf flour 8g (A3)**	
Score	n	%	n	%	n	%
	0	0	0	0	0	0
	0	0	0	0	0	0
	1	3,33	0	0	9	30
	19	63,33	20	66,67	16	53,33
	10	33,33	10	33,33	5	16,67
Participant (n)	30	100	30	100	30	100
Total score	129		130		116	
Mean (Average)	4,30		4,33		3,86	

Scent is one of the factors that determine the quality of a product. Scent determines the delicacy of a product. Based on the results of the acceptance test on 30 consumer panelists contained in table 4 for the scent of moringa gluten free choux with 4g of moringa leaf flour, the mean obtained is 4.30, which means that this Gluten Free Choux scent is in the very acceptable criteria. for the scent of moringa gluten free choux with 6g of moringa leaf flour, the mean obtained is 4.33, which means that the scent of gluten free choux is included in the criteria of being highly favored. for the scent of moringa gluten free choux with 8g of moringa leaf flour, the mean obtained is 3.86, which means that the scent of Gluten Free Choux is included in the preferred criteria. This study, seen from the scent assessment, showed that for all treatments it was quite favored by the panelists, this was because the addition of moringa leaf flour made the choux paste scent unique and like the scent of matcha.

Table 5. Hedonic Test Results of Gluten Free Choux . Flavor Indicators

Aspec	**Flavor Indicators Gluten Free Choux**					
	Gluten free Choux with Moringa leaf flour 4g (A1)		**Gluten free Choux with Moringa leaf flour 6g (A2)**		**Gluten free Choux with Moringa leaf flour 8g (A3)**	
	n	%	n	%	n	%

Score	0	0	0	0	0	0
	0	0	0	0	0	0
	1	3,33	0	0	0	0
	19	63,33	12	40	23	76,67
	10	33,33	18	60	7	23,33
Participant (n)	30	100	30	100	30	100
Total Score	129		138		127	
Mean (Average)	4,30		4,60		4,23	

In a study conducted by Hasanah Hafidzah.,(2015) said that the higher the addition of Moringa leaves to a food ingredient, the more bitter the taste and the dense green color. Based on the results of the acceptance test on 30 consumer panelists contained in table 5 for the Gluten Free Choux taste with 4g of Moringa leaf flour, the mean obtained is 4.30, which means that the Gluten Free Choux taste is included in the criteria of being highly favored. for the Gluten Free Choux taste with 6g of Moringa leaf flour, almost some chose to like it and most chose to really like it, the mean obtained was 4.46, which means that the Gluten Free Choux taste was included in the criteria of being highly favored. for the Gluten Free Choux taste with 8g of Moringa leaf flour, the mean obtained is 4.23, which means that the Gluten Free Choux taste is included in the criteria of being highly favored.

Taste is the main indicator in determining the acceptance or rejection of a food product to consumers. Although in terms of appearance, aroma and texture, if the taste is not suitable, the product will be rejected by consumers. The hedonic test of the taste indicator explained that with the addition of 6g of Moringa leaf flour, the panelists received the most flavor.

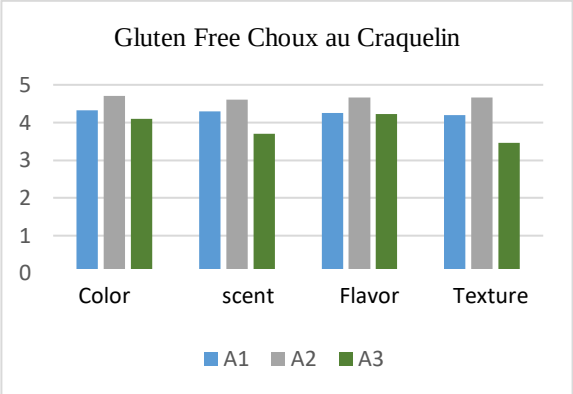
Table 6. Hedonic Test Results of Gluten Free Choux . Texture Indicators

Aspec	**Texture Indicators Gluten Free Choux**					
	Gluten free Choux with Moringa leaf flour 4g (A1)		**Gluten free Choux with Moringa leaf flour 6g (A2)**		**Gluten free Choux with Moringa leaf flour 8g (A3)**	
Score	n	%	n	%	n	%
	0	0	0	0	0	0
	0	0	0	0	0	0
	3	10	0	0	5	16,67
	18	60	17	56,67	16	53,33
	9	30	13	43,33	9	30
Participant (n)	30	100	30	100	30	100
Total Score	126		133		124	
Mean (Average)	4,20		4,43		4,13	

Texture is the appearance from the outside or the appearance that is seen visually by consumers so that it will affect the acceptance of the product by consumers. Good texture is determined by the basic ingredients used in making the product. According to Lawrie.,(1995), the impression of texture involves three aspects, namely whether or not the teeth easily penetrate the food, whether or not the food can be broken down into small parts and the amount of residue that remains after chewing.

Based on the results of the acceptance test on 30 consumer panelists contained in table 6 for the Gluten Free Choux texture with 4g of Moringa leaf flour, the mean obtained is 4.20, which means that the Gluten Free Choux texture is in the preferred criteria. For the Gluten Free Choux texture with 6g of Moringa leaf flour, the mean obtained is 4.43, which means that the Gluten Free texture is included in the criteria of being highly favored. for the Gluten Free Choux texture with 8g of Moringa leaf flour, the mean obtained is 4.13, which means that the Gluten Free texture is included in the preferred criteria. In the texture aspect, the highest average value obtained is. 43,33 which indicates that the panelists liked the Choux paste texture. This statement is in harmony with the texture of choux paste in general, which is crunchy on the outside and soft on the inside. The hedonic test of the taste indicator explained that with the addition of 6g of Moringa leaf flour, the panelists accepted the texture the most.

Graph 1. Acceptability of the whole Gluten Free Moringa Choux Paste



Based on graph 1, it is known that the results of the acceptability test or hedonic test were carried out by the panelists, the results obtained that the Gluten Free Moringa Choux Paste formulation made of 150 grams of rice flour, 25 grams of glutinous rice flour with formulation A2 or 6 grams of Moringa leaf flour is a formulation that The panelists liked the most from 4 indicators, namely scent, color, taste, and texture. Thus, based on consumer acceptance, this formulation is the most recommended formulation for production

Packaging Design

Image 3. Examples of packaging design designs, packaging, product logos

The introduction of choux paste products which are varied with the addition of Moringa leaves and low gluten, namely free gluten moringa choux paste as a souvenir food product from the Bandung area which is expected to develop and become one of the typical souvenir products of Bandung. In order for this choux paste product to reach a wider modern market, the right packaging design is needed. According to Wyrwa & Barska.,(2017) food packaging is a source of information that can attract consumers to buy it.

According to Margot et al.,(2005), the function of packaging aims to improve several important functions including: 1) packaging functions as a product protector. 2) packaging as a source of product information. 3) packaging functions as a brand/branding as well as a means of the product image in the field/market.

In order for the packaging to function optimally then: First, understand the characteristics of the product to be packaged. According to Subagyo.,(2021) the selection of the right packaging materials will be able to improve product quality and will prolong the expiration period of food products. The selection of the right packaging materials can also have an influence in maintaining or increasing sales. Therefore, the packaging of this gluten free moringa choux paste product uses folding carton packaging. According to Chatarina.,(2017) folding carton packaging has the ability to protect products from impact and exposure to sunlight so that the product is not damaged and the temperature is maintained. Second, for product information listed in the product, Figure 3 is an example of a design design. The illustrations used are vector, displaying animations of Choux Paste or sus cakes as well as the addition of Moringa leaves to describe the innovative variant of this eclairs product. The product name is at the bottom, the logo is at the top right of the packaging. The packaging is rectangular with a size of 8.5cm x 11cm x 5cm. Information on specific gravity is on the bottom front, and product storage instructions are on the side of the packaging. Information on the composition and consumption limits is on the back of the packaging. Third, packaging that has a function as branding and as a means of product image in the field/market. According to Kotler.,(1997), there are several ways of product positioning that can be done in product marketing, one of which is benefit. Homemade cake products use a position according to benefits, namely as a product that sells exclusive homemade cakes that can be adjusted to the wishes of consumers and have benefits and are good for health. As shown in Figure 3 there is information on the nutritional value contained in the product.

With this packaging design, the packaging is able to provide durability and hygiene for the product. After using the packaging with complete data, the product can be introduced to the public. Consumers who order are getting interested and ordering regularly and there are more and more enthusiasts, ranging from teenagers to adults.

4. CONCLUSION

1. The results of the analysis of consumer acceptance of Gluten Free Choux made from rice flour and glutinous rice flour with the formulation of Moringa leaf flour as a dye, have the results with the best formula quality, namely A2 with categories of color (score 4), scent (score 4), texture (score 4), and taste (score 4). Overall, the quality of fluten free moringa choux paste is in the quality category. Meanwhile, the sample with the 3rd order acceptability was choux with the formula 8g or A3 with a score of color (score 4), aroma (score 3), texture (score 4) and taste (score 4). Overall this product was accepted, but the strong smell of Moringa made the consumer panelists dislike the A3 formula. Based on the results of the acceptance analysis of Choux Paste made from rice flour and Moringa leaf flour as much as 1g has results with color (score 4), scent (score 4), texture (score 4), and taste (score 4) which means Choux is also included in the quality category and highly accepted.
2. The right packaging design needs careful consideration. Include complete information so that consumers believe in the quality of the product, and can even easily order a product again. The use of the right material is also related to the safety and durability of a product. The development of product designs made of Folding cartoons that are designed to make the packaging more attractive with various information that is needed by consumers, in the form of composition, nutritional content, storage durability and storage instructions. based on these conditions, making gluten free moringa choux paste products stronger and more competitive.

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