

LE 'ECLAIRE (MILLET ECLAIRE) WITH THE SUBSTITUTION OF MILLET FLOUR AS UTILIZATION OF LOCAL FOODSTUFFS

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ABSTRACT

This study purpose 1) Find the right recipe for making Le'Éclair 2) Knowing the community's acceptance of Le'Eclair 3) Le'Eclair nutritional information. The object of this research is éclair with millet flour substitution. The method using Research and Development (R & D), with a 4D model (Define, Design, Development and Dissemination). The results of this study: 1) The right recipe for making Le'Eclair with 50% millet flour substitution. The technique for making Le'Eclair is baking, packaging used plastic and paper cups 2) Community acceptance of Le'Eclair products, the limited scale acceptance of products is offered with an overall average 3.73, for modification products with a yield 3.8. The level of wide-scale acceptance is seen with an overall average f 3.8. 3) Le'Eclair nutritional information based on the proximate test, the nutrient content in 100 gr Le'Eclair namely air 37.75%, ash 2.67%, protein 9.37%, fat 23.19%, fiber 7.16%, and carbohydrates 19.87%.

Keywords: Millet Flour, Le'Eclair, Proximat Test

INTRODUCTION

Choux paste is one type of pastry with mild and large volume characteristics and is strongly leavened with large cells. Choux paste has two forms, eclairs (oval shape) and cream puff (round shape) (Faridah, 2008).

Eclair are made from dough called éclair paste (éclair dough) or choux paste, in French called pate a choux. Choux paste in Indonesia is better known as sus. In Indonesia, choux paste is a pastry product that accepted by the tongue of the Indonesian people because its taste is popular. Choux paste has very diverse contents. And from choux paste skin can be modified so as to create a new style choux paste (Gisslen, 2013).

Eclair is usually made from a mixture of water, sugar, salt, butter, wheat flour (flour), and eggs. Wheat flour in the making of choux paste serves as a framework for choux paste. Wheat flour contains starch and protein which functions as a framework. Formation of éclair dough can occur with the ability of starch gelatination when the dough is baked. Thus the role of starch found in wheat flour can be replaced with other flour which has relatively the same level. The type of local flour that

allows use as a substitute for wheat flour is millet flour.

Millet is a group of plants from the subfamily of grasses (Graminae) (FAO, 1972). Millet is a small seed cereal and is included to minor economic plants with nutritional content similar to other food crops such as rice, corn and wheat. Millet can live in low soil fertility, low humidity, and at high temperatures. In Indonesia millet plants are usually cultivated in several areas such as Labor, Jember, South Sulawesi such as Enrekang, Sidrap, Maros, Majene, and other regions. The types of millet that are usually found in Indonesia such as millet, cantel, ote, red millet, and yellow millet. Millet has a low glycemic index level and can reduce high blood pressure compared to wheat or rice. Millet is believed to prevent cardiovascular diseases such as strokes and heart attacks.

Indonesian people are not familiar with millet as food, usually millet is only used as bird feed, even though this plant can be processed into food by the community to support food security (Marlin, 2009).

The advantages of processing millet into millet flour are increasing usability, yield and use value, more easily processed into

products with high economic value, easier to mix with flour and other ingredients and in terms of nutrition millet flour has a protein content which is higher than corn and rice and low in gluten. Millet flour has a water content of 9.19%, 1.80% ash, 2.58% fat, 11.29% protein, 56.53% starch, 74.52% carbohydrate, and 2.01% crude fiber (Prabowo , 2010)

The use of millet flour in the manufacture of products in addition to adding nutrients, is also useful in reducing gluten content, gluten is difficult to digest by the body so that the digestive system becomes disrupted. The use of millet flour in the manufacture of food products such as wheat flour-based food products is highly expected to reduce the dependence of Indonesian people on wheat flour.

The purpose of this study are: 1) Know the right recipe for making Le'Eclair with substitution of millet flour. 2) Knowing community acceptance of Le'Eclair products 3) Knowing Le'Eclair product nutritional information

METHOD

The method that used in this study is research and development methods, with the model used is the 4-D development model. The 4-D development model developed by S. Thiagarajan, Dorothy S. Semmel, and Melvyn I. Semmel (1974: 5), consists of 4 main steps namely Define, Design, Development, and Disseminate. This research method was chosen because it aims to produce a development product in the form of an eclair pastry product with substitution of millet flour. The development product feasibility test by validation, and the preferences test of semi-trained panelists.

PERIOD AND RESEARCH LOCATION

Location

The research was held in the Culinary Laboratory, Department of Food and Clothing Engineering Education, Faculty of Engineering, Yogyakarta State University.

Period

This research begin from February to May 2019

PRODUCT TESTING MATERIALS AND TOOLS

Form Experiment

Form experiment is used to determine whether the product that approaches the criteria can be used for development. This form is used for 3 reference recipes for each product. Assessment can be done by colleagues or others. Characteristics assessed include color, aroma, taste and texture. The results of the study will be used as input for product development.

Forms of Validation Sensory Tests

The sensory validation test I for Le'Eclair products is a tool for sensory testing by experts whose contents include name, date, product name, assessment and signature. How to use the validation form, the expert must assess the product as a result of practice which includes the characteristics of color, aroma, taste and texture. The results of the assessment will be used as suggestions for product improvement.

Forms of Panelist Sensory Tests

Sensory test forms (panelists) are used for acceptance testing of limited scale products for 30 people. The way to use sensory test forms is that panelists are asked to give a value for the level of product preference which includes the characteristics of color, aroma, taste and texture as well as product product comments. Granting numbers in the form of crossing numbers that represent highly disliked, disliked, liked, very liked.

Acceptance Level Test Form

After the product validation and acceptance test, the results of the development products that have produced standard recipes are then held an exhibition to introduce the products that have been made to the general public and conduct extensive scale tests. The form contains the name, date, product name

Stationary

Stationery are used to fill in the forms provided by the researcher. Stationery in the form of pens.

DATA SOURCES / RESEARCH SUBJECTS

The subject of this study was conducted on 2 experts at the validation stages 1 and 2, then the panelists' preference test was aimed at 30 semi-trained panelists, and at the final stage of the acceptance test conducted at the exhibition aimed at 80 untrained panelists using assessment through forms.

Explanation of data sources that can be presented in table form.

Table 1. Data source / product testing subject

No	Research stage	Data sources	Amount
1	Presentation :Seminar proposal	expert	2 people
2	Validation	Expert	2 people
3	Presentation :Sensory test	Semi-trained panelist	30 people
4	Presentation :Product Exhibition	Untrained panelist	80 people

DATA ANALYSIS TECHNIQUE

Validation Test Data Analyzed As Descriptively Qualitatively.

This study used a qualitative descriptive research method. Djarn Satori (2011: 23) reveals that qualitative research is carried out because researchers want to explore phenomena that cannot be quantified that are descriptive such as the process of a work step, formula for a recipe, notions of a variety of concepts, characteristics of an item and so forth.

Sensory Test Data Analyzed With T-Test

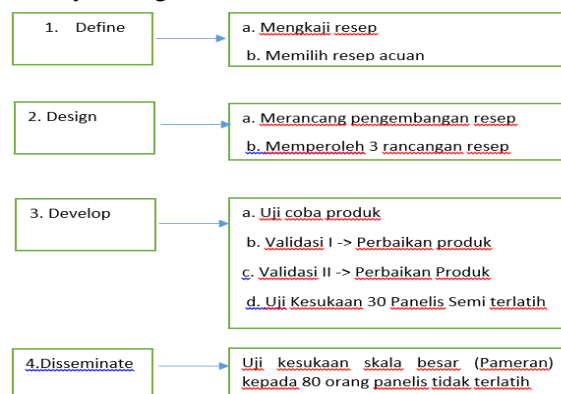
Sensory or organoleptic evaluation is science that used the human senses to measure

the texture, appearance, aroma and flavor of food products. Consumer acceptance of a product begins with its assessment of appearance, flavor and texture. Sensory testing (panel testing) plays an important role in product development by minimizing risk in decision making. Panelists can identify sensory characteristics that will help to describe the product. Panelists are asked to give their personal responses about likes or vice versa (dislike). Besides the panelists expressing their happy, like or opposite responses, they also expressed their favorite level. These favorite levels are called the hedonic scale. For example the hedonic scale such as: very liked, liked, disliked, very disliked.

The T-test or often termed the t-test, is a type of statistical test that aims to compare the average of two groups in pairs. Paired samples can be interpreted as a sample with the same subject but experience 2 different treatments or measurements, namely measurements before and after a treatment is performed.

PROCEDURE

The type of research used is R & D (Research and Development) or research and development design. Research and development design is research design to produce certain learning products and test the effectiveness of the product (Sugiyono, 2012: 407), using the 4D development model (Define, Design, Develop and Disseminate) (Endang Mulyatiningsih, 2012: 179).



Picture 1. Thinking Framework Define

Le'Eclaire is Eclaire with Chocolate Filling. Eclaire is one type of choux paste product. Eclaire ingredients are made with flour, water, eggs, margarine, baking powder and salt. But the recipe for flour development uses substitution from millet flour.

At this stage researcher search for three reference recipes from trusted sources such as books, journals, jobsheets, and magazines. From the three recipes, an experiment will be conducted to get the best reference recipe that will be used as a control of the product that will be made with flour substitution. Here is a table from the Eclaire reference product recipe.

Design

Based on the recipe for the reference product, the best recipe is chosen, then try again with a different ratio of substitution flour (millet flour) to find out which shape, size, color, texture, aroma, taste is most preferred.

Table 2. The Selected Recipe Eclaire Reference Products

Ingredients	Reference Formula	Formula Development		
		F1 (30%)	F2 (40%)	F3 (50%)
Wheat flour	41,7 gr	29,2 gr	25 gr	20,9 gr
Millet flour	-	12,5 gr	16,7 gr	20,9 gr
Water	83,3 gr	83,3 gr	83,3 gr	83,3 gr
Egg	50 gr	50 gr	50 gr	50 gr
Butter	33,3 gr	33,3 gr	33,3 gr	33,3 gr
Baking Powder	1,7 gr	1,7 gr	1,7 gr	1,7 gr
Salt	1 gr	1 gr	1 gr	1 gr

Development

Based on the trial of making Le'Eclaire with different comparisons of millet flour, Le'Eclaire was found to be the most preferred in terms of shape, size, color, texture, aroma, taste, Le'Eclaire with 50% flour millet substitution.

Table 3. Selected Le'Eclaire Development Product Recipes

Ingredients	Reference Formula	F3 (50%)
Wheat flour	41,7 gr	20,9 gr
Millet flour	-	20,9 gr
Water	83,3 gr	83,3 gr
Egg	50 gr	50 gr
Butter	33,3 gr	33,3 gr
Baking Powder	1,7 gr	1,7 gr
Salt	1 Gr	1 gr

Disseminate

To find out the favorite level of Le'Eclaire products, testing was carried out. Panelist sensory test of Le'Eclaire products by 30 semi-trained students, namely from Technical Education students, Food and Clothing Engineering education department, Faculty of Engineering, Yogyakarta State University. The product tested in the panelist test is a product that has been substituted and assessed by the expert in validation I, and validation II. Test of product acceptance by the public as many as 80 people was carried out at the final project exhibition. At this stage the product is assessed by the panelists, to determine the level of product acceptance by the general public / consumers.

RESEARCH RESULTS AND DISCUSSION

To take advantage of local food ingredients such as flour millet as a raw material for le'eclaire, further testing is needed. There are several steps taken during the research including the following:

Phase I Proposal Seminar

At this stage the activities carried out are in the form of exposure to the contents of the proposal to the supervisor and examiner, the purpose of this stage is to get useful criticism and suggestions to improve the research for the better.

Phase II Validation and Revision

At this stage the development products that have been substituted for local food are tested to the expert as many as 2 people, if at the first validation stage the development product is not considered good, then the validation stage will be done again. Critics and suggestions during validation by experts are

recorded in the form provided. The following are the results of the expert validation test:

SENSORY FORM (VALIDATION I)

Expert : Sutriyati Purwanti, M.Si

Date : March 13th 2019

Product : *Le'Eclair*

Table 1. Sensory Test (Validatino I)

Characteristic	Sample	
	Reference Product	Development Product
Shape	3	3
Size	3	3
Color	3	4
Aroma	3	3
Taste	3	3
Texture	2	2
Overall	3	3
Presentation	3	3
Tidiness	3	3

Explanation :

1 Very Disliked 3 Liked
 2 Disliked 4 Very Liked

SENSORY FORM (VALIDATION I)

Expert : Dr. Dra. Badraningsih

Date : March 13th 2019

Product : *Le'Eclair*

Table 5. Sensory Test (Validatino I)

Characteristic	Sample	
	Reference Product	Development Product
Shape	3	3
Size	3	4
Color	3	3
Aroma	3	3
Taste	3	3
Texture	2	2
Overall	3	4
Presentation	3	4
Tidiness	3	4

Explanation :

1 Very Disliked 3 Liked
 2 Disliked 4 Very Liked

In the first validation stage, it can be seen that the product development assessment carried out by expert 1 and expert 2 assesses that the product is not good in its texture, so the expert expects a product improvement, by validating the second stage with the following results:

SENSORY FORM (VALIDATION I)

Expert : Sutriyati Purwanti, M.Si

Date : March 22th 2019

Product : *Le'Eclair*

Table 6. Sensory Test (Validatino II)

Characteristic	Sample	
	Reference Product	Development Product
Shape	3	4
Size	3	4
Color	3	4
Aroma	3	4
Taste	3	4
Texture	3	4
Overall	3	4
Presentation	3	3
Tidiness	3	3

Explanation :

1 Very Disliked 3 Liked
 2 Disliked 4 Very Liked

SENSORY FORM (VALIDATION I)

Expert : Dr. Dra. Badraningsih

Date : March 22th 2019

Product : *Le'Eclair*

Table 7. Sensory Test (Validatino II)

Characteristic	Sample	
	Reference Product	Development Product
Shape	3	4
Size	3	4
Color	3	3
Aroma	3	4
Taste	3	4
Texture	2	4
Overall	3	4
Presentation	3	4
Tidiness	3	4

Explanation :

1 Very Disliked 3 Liked
 2 Disliked 4 Very Liked

In the second stage of the validation test the results of the assessment of the two experts showed good results with the overall results getting a value of 4 which means the product is very preferred, so the product is declared to pass validation II.

Stage III Semi-Trained Panelist Sensory Test

At this stage 30 sensory panelists were tested for 30 sensors. At this stage, 30 reference products and development products are made, so each panelist gets 2 product samples, the panelists are asked to give an assessment of each product, but they certainly do not know which products

are reference and product development. The reference product is given code 214 while the development product is given code 516. Below is the result of the test of preference for semi-trained panelists:

The sensory tests carried out at this stage include tests on the color, aroma, texture, taste, and overall product, and obtained results as in the table below.

Table 8. Semi-Trained Sensory Test Results

	Control	Development	P Value
		t	T test
Color	3,73	3,86	0,10
Aroma	3,66	3,73	0,29
Texture	3,6	3,76	0,08
Taste	3,67	3,73	0,29
Overall	3,73	3,8	0,27

The above results show that the numbers obtained by p value from product control and development are more than 0.05, so it can be said that the product is not significantly different then the product is accepted.

Stage IV Wide Scale Acceptance Test (80 Trained Panelists)

At this stage the acceptance test is carried out at the exhibition. At this stage the researcher made 80 development products to get an assessment from the wider community (untrained panelists). This stage is done to get visitors' response to product development regarding their level of acceptance. The final results of this wide-scale acceptance test are presented in the following table based on the number of 80 forms:

Table 9. Wide Scale Preference Test Results

Characteristic	Average score
Color	3,7
Aroma	3,8
Texture	3,7
Taste	3,8
Overall	3,8

Explanation :

1 Very Disliked

2 Disliked

3 Liked

4 Very Liked

The table above is the average score on the untrained panelist test which results are for taste, and the aroma has a score of 3.8 meaning that it is very popular while for color, texture and overall score 3.7, which means it is preferred.

Proximate Test

In this study, a proximate test was carried out at the Primary Chem-Mix Laboratory on April 4, 2019. The purpose of this proximate test was to determine water, ash, protein, fat, crude fiber, carbohydrate and energy levels with the following results:

Table 10. Proximate Test Results Per100g

Sample Code	Analyze	Test 1	Test 2
<i>Le'Eclaire</i>	Water	37,77	37,72
	Ash	2,58	2,75
	Protein	9,30	9,44
	Fat	23,04	23,34
	Fiber	7,23	7,09
	Carbohydrate	20,07	19,67
	Energy	325,52kal	327,20kal

The table above shows the proximate test results per 100 product development. The proximate test was performed twice so that the results of the data obtained were accurate. From the results above it can be seen that the most content in the product is water with a yield of 37.77gr and the smallest is the ash content with a yield of 2.58gr. This product contains an energy of 325.52kal / 100gr.

CONCLUSIONS AND SUGGESTIONS

Conclusion

Based on the observations, analyzes and data obtained from the results of research on making Le'Eclaire products with millet flour substitution it can be concluded as follows: 1) The right recipe for making Le'Eclaire with millet flour substitution by 50%. The technique if making Le'Eclaire is baking, the product is packaged using plastic opp and paper cups. 2) The results of the limited-scale acceptance of

the limited-scale acceptance receipt test products are indicated by the overall average yield of 3.73 whereas, for the modified products indicated by the results of 3.8. The level of wide-scale acceptance is indicated by the overall results of 3.8. 3) Based on the proximate test, the nutrient content in 100 gr Le'Eclair is 37.75% water, 2.67% ash, 9.37% protein, 23.19% fat, 7.16% fiber, and carbohydrate 19.87 % .

Suggestion

Based on the results of the study, it is suggested that the following are: 1) When oven using an oven stove with no temperature measurement, the oven temperature must be monitored using a thermometer so that it is not too hot so the le'eclair can cook evenly. 2) The results of testing the acceptance of Le'Eclair products are favored and well received by the community, so the product can be used as a new business opportunity to be developed as a product by recording local food ingredients.

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