

RED RICE CREAM HORN WITH THE SUBSTITUTION OF RED RICE FLOUR AS A DESSERT PRODUCT INNOVATION

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ABSTRACT

The need for flour in Indonesia was increasing because the consumption of Indonesian people towards flour-based food was increased. Pastry was one of popular foods in Indonesia, one of their products were cream horn. All this time pastry products used flour as their main ingredients. To reduce the increasing need of flour and imported wheat in Indonesia, this study used local food ingredients, one of which was red rice flour to substitute the flour. The development of pastry products that use local food ingredients were limited, especially on cream horn. The objective of this study was to find a standard recipe, discover the nutrient content, and to know consumer acceptance of cream horn with red rice substitution. To find the standard recipe, this study used research and development with 4D development model which resulted 15% substitution of red rice flour. Proximate analysis was used to discover the nutrient content which resulted carbohydrate as the most dominant nutrients. Hedonic test was used in this study and resulted red rice cream horn is liked by consumer.

Keywords: Red Rice Cream Horn, Red Rice Flour, Proximate Analysis

INTRODUCTION

The need for flour in Indonesia is increasing. According to the data from Indonesia Central Bureau of Statistics (BPS), the volume of imported wheat commodities in the first semester of 2018 has increased 4% compared to the previous year to be 5.97 million tons. According to Indonesian Flour Producer Association (APTINDO), this is in accordance with the increase in consumption of the Indonesian people towards flour-based food for 6.2% throughout 2018 [1].

The term pastry comes from the word paste, meaning, in this case a mixture of flour, liquid and fat [2]. All this time pastry products is identical to using flour as a main ingredients, so that the need of flour is increasing. Cream horn is one of the continental pastry products that is made from horn-shaped puff pastry using cone mold, then filled with various variations of cream. It can be served with a sprinkle of granulated sugar, icing sugar, chocolate compound, or simply plain.

With the increasing need of flour and imported wheat in Indonesia, this can be

reduced with substituting the flour with local food ingredients, one of which is red rice flour.

Red rice flour is one of semi-finished products from red rice that can be stored longer, easy to blend (made composite), rich of nutrients (fortified), shaped and faster to cook as needed [3]. Red rice (*Oryza nivara*) belongs to the group of grains and it has reddish color. Red rice is a good source of various types of B vitamins, especially vitamin B1 (thiamine), which is needed as a messenger between brain and spinal cord. Red rice is not like any plain rice, is also a good source of folate, vitamin E and NSP (fiber) [4]. Red rice in addition to strongly supporting the absorption of particles into the body and the conversion of beta-carotene into vitamin A is also an antioxidant and anti-inflammatory compound in the body that lead to anticancer [5]. Red rice has anthocyanin pigment as a coloring source which acts as an antioxidant to prevent a various kinds of disease, for example diabetes mellitus [6].

The development of pastry products by using local food ingredients still limited, especially on cream horn, so research is needed

to find a standard recipe of cream horn with red rice substitution, discover the nutrient content of cream horn with red rice substitution, and to know consumer acceptance of cream horn with red rice substitution.

METHOD

Research Date and Place

This study takes place in Food Laboratory, Fashion and Culinary Engineering Education Department, Faculty of Engineering, Yogyakarta State University from February until April 2019.

Tools and Materials

Rolling pin, mixing bowl, cone molding, scraper, baking sheet, balloon whisk, piping bag, brush and oven were tools that was used in this study.

Pastry flour, red rice flour, butter, pastry margarine, water, salt, cream cheese and refined sugar were materials that was used in this study.

Product Production Procedure

The process began with making the puff pastry using English method. Make the horn by cut the puff pastry into a strip, then roll the dough into the cone mold then bake it at 170°C for 20-30 minutes. While the horn is being baked, make the filling by mix the cream cheese with refined sugar. When the horn is baked, fill in the horn with cream cheese.

Development Procedure

Research and Development (R&D) with 4D (define, design, develop and disseminate) development model were used in this research.

Research and Development (R&D) is a process or steps to develop new product or perfecting certain products. This method is a research method used to produce certain products and to test the effectiveness of those products [7]. This method is in the form of cycle, which begins with needs, problems that require solving with certain products and testing the effectiveness of those products.

Define

Define is useful for deciding and define needs and to collect various information relating to the product to be developed. This step begins with finding basic problems by raising facts and alternative solutions.

In this step, reference recipe of puff pastry were discovered. The recipes are from text book or cook books, there are Professional Baking by Wayne Gisslen, Buku Lengkap Homemade Pastry by Dian Nimpuno, and Bake: The Essential Companion by Alison Thompson (Table 1).

Table 1. Reference Recipes

Ingredients	Recipe 1 (Professional Baking by Wayne Gisslen)	Recipe 2 (Buku Lengkap Homemade Pastry by Dian Nimpuno)	Recipe 3 (Bake: The Essential Companion by Alison Thompson)
Pastry Flour	500 g	500 g	450 g
Butter	75 g	50 g	-
Water	250 g	200 ml (Cold)	225 ml
Pastry Margarine	300 g	500 g	450 g
Salt	10 g	1 tbsp	2 tbsp
Lemon Juice	-	1 tbsp	-

Design

This step is used to design products by deciding the formula of red rice substitution. This was used to discover a standard recipe of red rice cream horn. The formulation that was used in this study were 15%, 30% and 45% (Table 2).

Table 2. Formulation of Red Rice Substitution

Ingredients	Reference Recipe	15%	30%	45%
Pastry Flour	500 g	425 g	350 g	275 g
Red Rice Flour	-	75 g	150 g	225 g
Butter	75 g	75 g	75 g	75 g
Water	250 g	250 g	250 g	250 g
Pastry Margarine	300 g	300 g	300 g	300 g
Salt	10 g	10 g	10 g	10 g

Develop

This step is used to produce the chosen formula and reference recipe that has been tested with experts (validation) until it reached the desired texture, aroma, flavor, and color. The plating, garnish, filling and packaging were also discovered in this step.

Validation is done by two experts, in this study were two lecturers at Culinary Engineering Education Department, Yogyakarta State University. The developed product and reference product were presented simultaneously to the experts. After reaching the desired texture, aroma, flavor and color then continue with proximate analysis.

Disseminate

Disseminate is used to know consumer acceptance. This step is divided into two parts. The limited scale acceptance test and exhibition.

The developed product that has been tested by experts are then tested to a semi-trained experts, in this study were some second semester students at Culinary Engineering Education Department, Yogyakarta State University. Then the developed products are presented in exhibition with minimum 60 people visitors..

Proximate Analysis

Proximate analysis were used in this study to discover the nutrient content such as protein, carbohydrate, fat, fiber of the developed product. The proximate analysis takes place in Chem-mix Pratama Laboratory, Bantul, Special Region of Yogyakarta in April 2019.

Consumer Acceptance

Hedonic test were used in this study. Basically in hedonic test, the consumer or tester were asked to taste the product and then score the color, aroma, flavor, texture and overall acceptance of the product to their preferences. The score scale are 1 – very dislike, 2 – dislike, 3 – like, and 4 – very like.

RESULTS AND DISCUSSION

Define

Recipe from Professional Baking Sixth Edition by Wayne Gisslen were chosen as the reference recipe of the puff pastry. It is because the puff pastry has the most desired texture among all of the other recipes.

Design

15% were chosen as the formulation of red rice substitution because the texture of the formula is similar with the reference recipe, while the 30% and 45% are tend to be chewy rather than crispy.

Develop

Mint leaf, icing sugar and strawberry were the garnish of the product. It created a color harmony to the product in the plating.

The results of the analysis of the proximate analysis were given in Table 3.

Table 3. Proximate Analysis of Red Rice Cream Horn

Analysis	First Test	Second Test
Water	31.1581%	31.6772%
Ash	2.2823%	2.0406%
Protein	8.6633%	8.7457%
Fat	7.3656%	7.7073%
Rough Fiber	4.491%	4.8117%
Carbohydrate	46.0813%	45.0172%
Energy	281.0649 kal/100g	280.4120 kal/100g

From the table, it is known that red rice cream horn contained a lot of carbohydrate (46%) and lots of energy (281 kal/100g).

Disseminate

The limited scale acceptance test was done in Chemistry Lab of Culinary Engineering Education Department, Yogyakarta State University on March 27, 2019. In this test, the developed product and reference product were presented simultaneously to the tester. The reference product are coded 911, and the developed product are coded 610. The tester were asked to score the color, aroma, flavor, texture and overall acceptance to both reference

product and developed product to their preferences.

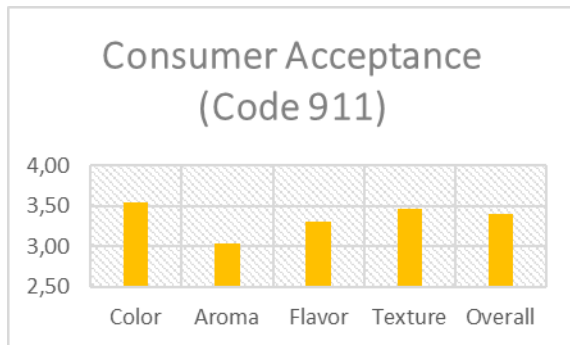


Figure 1. Consumer Acceptance of Reference Product

Based on Figure 1, it is discovered that the average acceptance of the color of the reference product is 3.53, the aroma is 3.03, the flavor is 3.30, the texture is 3.47, and the overall acceptance is 3.4.

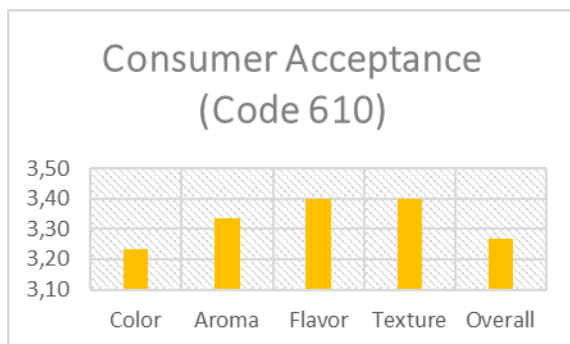


Figure 2. Consumer Acceptance of Developed Product

Based on Figure 2, it is discovered that the average acceptance of the color of the developed product is 3.23, the aroma is 3.33, the flavor is 3.4, the texture is 3.4, and the overall acceptance is 3.27.

From Figure 1 and Figure 2, it is concluded that the tester liked both reference product and developed product because it reached score more than 3.

After limited scale acceptance test, the developed product then being fixed some of the parts according to the advice given by the tester during the limited scale acceptance test before the exhibition begins. The exhibition was held in Yogyakarta State University Auditorium on April 25, 2019. The minimum people in the exhibition to do the consumer acceptance test were 60 people, and it got 66 people to take the

acceptance test. The 66 people were the visitor of the exhibition. The visitor were asked to score the color, aroma, flavor, texture and overall acceptance of red rice cream horn to their preferences.



Figure 3. Consumer Acceptance in Exhibition

Based on Figure 3 above, it is discovered that the average acceptance of the color of red rice cream horn is 3.71, the aroma is 3.56, the flavor is 3.79, the texture is 3.74, and the overall acceptance is 3.80.

From Figure 3 it is concluded that the visitor of the exhibition liked red rice cream horn because it reached score more than 3.

CONCLUSION

Based on the observation, analysis and data collected from this study, it is concluded that the recipe formula of red rice cream horn consist of 85% pastry flour and 15% red rice flour. The nutrient content of red rice cream horn is mostly dominated by carbohydrate with 46% content, and contains a lot of energy with 280 kal/100 g. The consumer acceptance of red rice cream horn can be accepted and liked by consumer in terms of color, flavor, aroma, texture and overall acceptance.

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