

Using Goroho Banana Flour as a Substitute in Making Cookies Rolls

Tineke Langi and Teltje Koapaha

Abstract---This study's aimed is to evaluate the substitution of wheat flour with goroho banana flour in making cake rolls to produce a crispness appropriate to consumer satisfaction. The substitution ratios for cake rolls were 90% wheat flour and 10% goroho flour, 80% wheat flour and 20% goroho flour, 70% wheat flour and 30% goroho flour, 60% wheat flour and 40% goroho flour, and 50% wheat flour and 50% goroho flour. Analysis evaluated the water content, protein, fat, carbohydrate, and ash to determine which substitution ratio scored highest on an organoleptic test. Results showed that the ratio of 50% wheat flour and 50% goroho flour achieved the highest consumer acceptance in terms of taste (i.e., taste, smell, and texture) and 1.78% water content, 0.83% ash, 18% fat, and 5.8% protein.

Keywords---Goroho Banana, Flour, cake rolls, consumer satisfaction

I. INTRODUCTION

GOROHO bananas belongs to the kind of "plantain" which is one type of banana that cannot consumed directly but need to be processed first. This type of banana is usually consumed in the form of chips or by boiled. Therefore, some efforts are needed to increase the utilization of this banana to another form. For example, this banana can be processed into flour form, which can then be used into a variety of foodstuffs. Goroho banana (*Musa acuminata*, sp) is a specific type of banana that locally in North Sulawesi. This banana contains some nutrients such as vitamin C, vitamin B6, vitamin A, thiamin, riboflavin and niacin. In 10 grams banana fruit contains 27 grams of starch, 1.2 grams of protein, 0.3 grams of fat, 0.5 grams of fiber, 400 mg of potassium and 70 grams of water (Ashari, 1995 in Kiay, 2011). Currently, the consumption level of goroho banana in North Sulawesi has been rise high enough caused by mouth-to-mouth information about the benefits of this banana. In general, goroho banana is consumed by fried, boiled or made into flour as an ingredient to make another food products.

Research by Suryanto et al (2011) about goroho banana stated that goroho banana is a food that gives a positive effects on health because it contains phenolic compounds, flavonoids, tannins and also has antioxidant activity.

Various attempts have been made by developing countries to lift the utilization of composite flour, where the use of wheat flour was replaced by local starches such as goroho banana

flour in manufacturing bakery or cake products, thereby reducing the costs of importing wheat. Banana flour is one of the products processed from raw bananas through the process of drying and milling. Banana flour is not only as a source of calories, but also as a source of other nutrients. Beside containing carbohydrate, banana flour also contains some vitamins and minerals (Kania, 2003). Banana flour can be further processed into various food products, for example for the manufacture of cakes, porridge, crackers and bread.

The use of banana goroho can be led as one way to support national food security, as one alternative, by processed into flour to be used as a substitution material in the making of traditional cakes, such as a roll cookie. By this innovation, this may reduce the use of flour in making of roll cookies. The fact that the price of flour is increasing lately, we've done some innovation to substitute the regular (wheat) flour with goroho banana flour.

Roll cookies is a traditional cookie that is loved by the people. Beside it was easy to get, the price is also affordable, so it suitable to consume as a daily snack. In effort to maximize the utilization of goroho banana flour, we've made a roll cookie in this study with goroho banana flour substitution. The substitution of goroho banana flour has done to see the potential of goroho banana flour as an ingredient in goroho roll cookies in accordance with the taste of consumers.

The objectives of this research work therefore are: to evaluate the substitution of wheat flour with goroho banana flour in making cookies rolls to produce a crispness appropriate to consumer satisfaction

II. MATERIALS AND METHODS

A. Material Procurement

Goroho bananas, flour, sugar, salt, coconut milk, margarine, eggs were obtained from the local market and the chemicals and reagents used were of analysis.

B. Preparation of the Goroho Banana Flour

First, the goroho bananas was sorted to removed of dirt and damaged. Peeled goroho banana with stainless steel blades, after peeled banana fruit pulp soaked in water, then the meat sliced with a knife or with a slicer (slicer) with a thickness of 0.5 to 1 cm. Then blanched the bananas in temperature of 80°C for 15 minutes. After that dried the bananas at a temperature of 60°C for 13 hours in an oven. The dried bananas grinded and then sieved through 80 mesh. Flour that is so then packed in a container.

C. Preparation of Roll Cookies

The flour used for roll cookies production was from blends of goroho banana flour and wheat flour. The flour was

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obtained by blending in the ratio of (10:90; 20:80; 30:70; 40:60 and 50:50). Besides this all, were blended with, 150 grams sugar, 3 eggs beat until blended, 1 tsp cake emulsifier, 1 tsp baking powder, and 450 ml of coconut milk.

Mix eggs, sugar and cake emulsifier and then put the flour (blend in the ratio), 1 tsp milk powder and baking powder very well and then pour the coconut milk and mix them all until they blend well. Heat the roll cookies maker, pour 1 tbs mixture in the middle and close it. Let it bake for around 30 second until the mixture is ready (if you bake it more than 30 secs, you'll get crispy egg roll but you won't get a nice color). Open the roll cookies maker, and scroll it using chop stick. Take it out from the pan, let it gets cold and take it out from the chop stick. To make it crunchy, put the roll cookies in the oven, with low temperature for a little bit and put them in a jar.

D. Sensory Evaluation and Proximate Analysis

Sensory evaluation of rolls cookies using a 25 panelists was carried out as per 5 points hedonic scale. The panelists were required to observe the sample, taste and score. Then rinse their mouth with water before tasting another sample. The products were analysed based on the following parameters of appearance, color, taste, aroma, and crispness. The proximate analysis of the rolls cookies was carried out according to the method of AOAC (1990).

III. RESULT AND DISCUSSION

The measurement of taste is to show the consumer acceptance levels of foodstuffs. This methods is generally done by using the senses or known by the organoleptic test (Winarno, 1992). This test uses hedonic scale method and tested in 20 panelists. The parameters that has been tested were color, taste, smell, and crispness of our roll cookie. The results can be seen in Table 1.

TABLE I
MEAN VALUE OF THE ORGANOLEPTIC TEST OF ROLL COOKIES

Samples	Color	Taste	Aroma	Crispness	Overall
A : 90:10	3,85	3,7	3,7	3,65	3,725
B : 80:20	3,65	3,65	3,6	3,8	3,675
C : 70:30	2,55	3,45	3,55	3,85	3,350
D : 60:40	3,8	3,6	3,75	3,6	3,688
E : 50:50	4	4,1	3,8	4,3	4,050

The results of the organoleptic test has ranged from 3.35 to 4.05 which is between "neutral" to "like".

Table 1 shows that the treatment E (50:50) has the highest average value of the color preference level of rollcookies which is 4 that can be categorized as "like". Meanwhile the treatment C (70:30) has the lowest value which is 2.55 which can be categorized as "neutral". Panelists tend to like the E (50:50) treatment because of the color of the roll cookies was light brown and found it very attractive because the color is like cookies in general. Based on the analysis of variance, showed that the treatment was not give significant effect on the color. This is due to the color of roll cookies was rising on some comparisons, as well as the existing colors on the cake as much depends on the magnitude of the fire burning and techniques that has been used.

The average value in flavor of roll cookies in the treatment E (50:50) has the highest number in spite of other treatment which is 4,1 and can be categorized as "like", while the lowest value was obtained in the treatment of C (60:40) that is equal to 3.45 which can be categorized "neutral". While on treatment A, B and D are categorized as "tend to like".

A level of panelist's likeness to the taste the roll cookies was increasing as the percentage of banana flour that used. In treatment E, the typical smell of goroho in the roll cookies feels so significant. So the panelists tend to like the treatment E, that had a balanced comparison with other treatment. The average value of treatment E reached the highest level of whole acceptance which is 4.3 that can be categorized "like". Meanwhile the lowest value was on treatment D which is 3.6.

Based on the analysis of variance, showed that the treatment was not give a significant effect on the crispness of the roll cookies, because it depends on the composition and making techniques.

The results of organoleptic test about the crispness of this roll cookies was the panelists is the most preferred the treatment E with number 5:5 which produces a same crispness. The significant differences from formula 1 to 5 indicate the level of crispness biscuits was influenced by the concentration of the binder components. The crispness of the roll cookies is determined by the concentration of the binder and that affect the panelist's preference.

Table 1 shows that the level of acceptance of the odor on treatment E reach the highest number which is 3.8, while the lowest value was obtained in the treatment of C which is 3.55. Based on the analysis of variance showed that the difference in the formula does not give a significant effect on the smell of the roll cookie. The smell of roll cookies has a distinctive odor that was produced from the reaction of the composition or content in roll cookies with the burning process.

The result of the proximate composition of the roll cookies is shown in the Table 2. From this table, rolls cookies sample resulted in increased protein, ash and carbohydrate, while as moisture and fat content was decreased.

TABLE II
MEAN VALUE OF THE PROXIMATE COMPOSITION OF ROLL COOKIES

Samples	Moisture (%)	Ash (%)	Fat (%)	Protein (%)	Carbohydrate (%)
A : 90:10	1,80	1,5	18,76	4,5	73,44
B : 80:20	1,80	1,67	15,7	4,8	76,03
A : 90:10	1,79	1,67	15,7	5,1	75,74
B : 80:20	1,78	1,7	15,13	5,3	76,09
A : 90:10	1,77	1,83	14	5,8	76,60

Indonesian National Standard (01-2973-1992) of biscuit's water content is a maximum of 5 %. The water content of banana flour biscuits goroho is below 5 % so that may keep the shelf life of this cookies, because in the water content less than 5 % may be free from defects and of harmful microbes.

According to the Indonesian National Standard (01-2973-1992) The ash content in the biscuit is a maximum of 1.5 %. These results indicate that the ash content of goroho banana roll cookies is accordance with the standard. According Suprapti (2003) reported by Igfar (2012), the amount of ash shows the number of minerals that contained in the cookies,

and this study's result indicate a few content of the ash which means the number of minerals in goroho banana roll cookies.

The fat in biscuits goroho banana flour is 14-18,76 %. According to the Indonesian National Standard (01-2973-1992) the minimum fat content in biscuit is 9.5 %, and this shows that the fat in the goroho banana roll cookies has reached the standard.

The proteins in goroho roll cookies was indicated of 4.50-5.8% According to the Indonesian National Standard (01-2973-1992) the protein content of biscuits is at least 9 %. This shows that the amount of protein in goroho banana roll cookies still not in accordance with the standard.

Carbohydrates may found in foods as starch, sugar and crude fibers. According to the Indonesian National Standard (01-2973-1992), the carbohydrate content in biscuits is at least 70 %. Carbohydrate content of goroho banana roll cookies is 70 % of white variety, and for the red variety is 72.01 %. The number of the carbohydrate in this cookies has reached the standard. Based on the amount of carbohydrate content, these biscuits not only a carbohydrate supplier but also may give the nutritional needs of carbohydrate.

IV. CONCLUSION

- 1 Goroho banana flour can be developed into roll cookies.
- 2 Ratio of 50% goroho flour achieved highest consumer acceptance in term of organoleptic (color, taste, aroma and crispness) and 1.78% water content, 1.83% ash, 18% fat, 5.8% protein and % carbohydrate.

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