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Sensory characteristic of cassava (*Manihot utilissima*) using in the making of kwetiau

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1 Abstract. Kwetiau is a type noodles originating from the Chinese region with raw materials of rice flour. The use of rice flour as food is high enough plus rice is the main commodity for staple food. Therefore, the research aims to see the extent which cassava can replace rice flour but has no effect on the sensory characteristics. The added cassava formulation ranges from 0-40% of the total raw materials used. Increasing amount of cassava will decrease the amount of rice flour used. This study used the design of RAL 5 treatments, 3 repeats with one treatment as control. Organoleptic observations include color, texture, taste and, flavor. The advanced test is done by the way of Duncan's New Multiple Range Test (DNMRT) on a 5% real level. Based on the results of organoleptic analysis of the chosen treatment is the use of cassava 30% (treatment D) with the value of proximate: water content of 57,89%, ash content 0,94%, protein content 2,13%, fat content 2,46% and carbohydrate content of 36,42%.

1. Introduction

Multiple diverse of food consumption program, nutritious and balanced that planned by the government aims to reduce dependency on one particular food commodity. This condition is increasingly worsed when this dependency on the commodity of staple food such as rice. Rice, in addition as a staple food of Indonesia people is also used in a variety of foods both traditional and modern. This **10** leads to a higher dependency plus no more balance with the production of rice harvest per year. Therefore, as a preliminary step of rice consumption reduction starts from foods such as kwetiau.

According to [4] **2** kwetiau is a type of noodles made from rice and then [2] complements

that the kwetiau is white, flattened and wide. The kwetiau characteristic is not chewy like ordinary noodles derived from wheat flour so it can be replaced with other sources of starch such as cassava. The carbohydrate content of cassava is 35,3% [12]. The purpose of the study is to look for the decrease in rice flour that can be replaced by cassava ¹ but has no effect on its sensory characteristics.

2. Material and Methods

2.1. Materials and tools

The materials used in the making of kwetiau include rice flour, tapioca, salt, cassava and oil while the tools used in the manufacture of kwetiau are pan, scales, stoves, baking pan, steamers, spoons and the tools for sensory observations are plates, glassware and atcetera.

2.2 Research implementation.

This research started from making a kwetiau with the treatment of cassava addition through a decrease in ¹ the amount of rice flour that is 10%, 20%, 30%, 40% and as a control of the kwetiau without the addition of cassava. The kwetiau produced further tested its sensory characteristics with a hedonic test on 20 panelists [10]. The best sample on organoleptic test is analyzed its nutritional content.

2.3. Program

The program in this study is Complete Random Draft (CRD) with 5 treatments and 3 repeats. An advanced test with Duncan's ¹ New Multiple Range Test (DNMRT) at 5% real level. The following treatments are as follows:

A: no use of cassava

B: 10% use of cassava

C: 20% use of cassava

D: 30% use of cassava

E: 40% use of cassava

3. Results and Discussion

3.1 Color

The results of various investigations showed that the addition of cassava treatment does not affect the color of the kwetiau (the real level 5%). Organoleptic test results on the panelist can be seen in Table 1.

Table 1. Average color of kwetiau

Treatments

Average color of kwetiau

A (No addition of cassava)

3,60 a

D (30% addition of cassava)

3,47 a

C (20% addition of cassava)

3,40 a

B (10% addition of cassava)

3,33 a

E (40% addition of cassava)

3,27 a

The numbers followed by the same lowercase letter 5 in the same row and the same uppercase in the same column differ not real according to the DNMRT advanced test at a real level of 5%.

Based on Table 1 the highest color is without 2 the addition of cassava or control,

because with the addition of cassava has been steamed changes in terms of color. The color becomes rather yellowish white, this is because cassava has undergone the process of gelatinization first time-making before the manufacture of this kwetiau. 3 The color difference is more obvious with the controls due to the addition of cassava which is increasingly a lot however between the treatments are not real different from each other. According to [7] that the pre-gelatinization is generally lower degree of white on the flour. This is because the pre-gelatinization will dissolve some of the chemical components in the flour and starch cells such as sugar, amylose, protein. Furthermore, according to the [1] stated, 2 the addition of the tapioca in a large amount will lower the level of brightness on the product, which occurs due to the density of the gel increased.

3.2 Texture

On the test of variety investigation 9 to the texture of kwetiau is not real different from each other (5% level). The following is the average texture of the kwetiau by the panelists can be seen in Table 2.

Table 2. Average texture of kwetiau

Treatments

Average texture of kwetiau

A (no addition of cassava)

3,33 a

D (30% addition of cassava)

3,07 a

B (10% addition of cassava)

2,87 a

C (20% addition of cassava)

2,80 a

E (40% addition of cassava)

2,53 a

The numbers followed by the same lowercase letter **5** in the same row and the same uppercase **in the same** column differ not real according to the DNMRT advanced test at a real level of 5%.

In Table 2, in terms of texture D (addition **1** of cassava 30%) more liked by panelists, this value is under control. **2** The addition of steamed cassava has caused the texture of the kwetiau to be less chewy because the addition of cassava reduces the use of rice flour.

However, this is not an influence for panelists because the **3** characteristics of the kwetiau are not chewy like ordinary noodles derived from wheat. According to [5] rice flour that has been gelatinized and modified starch has been able to provide a chewy texture in the product.

In the cassava content is higher amylose while the amilopectin tapioca higher **3** so that the texture of the kwetiau becomes dense. Amilopectin in food products is stimulating **5** the occurrence of puffing process (blooming) where the product will be mild, chewy while starch with high amylose content tends to produce a hard product, because the process puffing occurs limited [9].

3.3 Taste

On the test of variety investigation to the taste of kwetiau is not real different from each other (5% level). The following is the average taste of the kwetiau by the panelists can be seen in Table 3 .

Table 3. Average taste of kwetiau

Treatments

Average taste of kwetiau

A (No addition of cassava)

3,13 a

D (30% addition of cassava)

3,07 a

C (20% addition of cassava)

2,87 a

B (10% addition of cassava)

2,80 a

E (40% addition of cassava)

2,73 a

The numbers followed by the same lowercase letter 5 in the same row and the same uppercase in the same column differ not real according to the DNMRT advanced test at a real level of 5%.

From Table 3 is seen for the taste of the kwetiau differ not real between treatments, this occurs because 2 the addition of cassava in the kwetiau does not affect the taste. In the kwetiau there is also no addition of seasoning that causes taste of the kwetiau changed. The taste is usually influenced by the raw materials that compose the product it self. The type of material used as a component of taste is salt, but it is used in small quantities, so it does not change the taste of the kwetiau. The taste is generally influenced by non-volatile components found in materials. Non-volatile components provide sweet, 8 bitter, sour, and salty, functioning as a medium for volatile components, and help withstand the evaporation of volatile components [3]. According to [6] taste is a combination of various constituent materials in the food.

3.4 Flavor

On the test of variety investigation to the flavor of kwetiau is not real different from each

other (5% level). The following is the average flavor of the kwetiau by the panelists can be seen in Table 4

Table 4. Average flavor of kwetiau

Treatments

Average flavor of kwetiau

A (No addition of cassava)

3,13 a

D (30% addition of cassava)

3,00 a

C (20% addition of cassava)

3,00 a

B (10% addition of cassava)

2,87 a

E (40% addition of cassava)

2,73 a

The numbers 4 followed by the same lowercase letter in the same row and the same uppercase in the same column differ not real according to the DN MRT advanced test at a real level of 5%.

From Table 4 is seen for the flavor of the kwetiau differ not real between treatments, this occurs because 2 the addition of cassava in the kwetiau does not affect the flavor.

The flavor of a food derived from the volatile components of the material used in the processing also comes from the processing process that has been done in the form of a steam. 3 According to the [8] the flavor on the food can come from components that already exist in the natural as in the fruit, spices, arising from the chemical changes of the basic components caused by processing such as heating and oxidation and because of 2 the addition of flavor ingredients (natural or synthetic).

3.5 Nutritional analysis of kwetiau products

3 Based on the results of the sensory test, it can be determined that the addition of 30%

cassava treatment (D) is liked because it gains the highest scoring score under the control of color, texture, flavour and flavor. ⁹ Nutritional value of products can be seen in Table 5.

Table 5. Product proximate value of selected kwetiau

Components

Nutrition value

No addition of cassava (kontrol)

30% aaddtion of cassava

Water content

59,41%

¹ 57,89%

Ash content

0,39%

0,94%

Protein content

3,55%

2,13%

Fat content

2,63%

2,46%

Carbohydrate content

33,61%

36,42%

In the Table 5 it seen on the rice flour is higher water content and protein while on the cassava is higher ash, fat and carbohydrate content. From this ³ data can be concluded that the difference in value occurs due to the replacement of the main raw material from rice flour to cassava. Cassava has a higher carbohydrate value but lower than its protein

value while the fat content in addition to being influenced by the ingredients, is also due to the use of oil during the steaming and the polishing of a kwetiau after the steaming

1 The use of oil in the process aims to avoid the sticky of kwetiau in the process of steaming and after the process of steaming. According to [11] water content on rice flour per 100 gram material is 12 grams, ash 145.8 mg, fat 0.3 gram, 7 grams of protein and 80 grams of carbohydrate. The nutritional value of cassava is 63% of water, 35,3%, of carbohydrate, 0,6% of protein, 0,2% of fat, 1,6% of fiber [12].

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