

## Wuak Piuak Organoleptic Study of Traditional Food Modified Using Cassava (*Manihot Utilissima*)

Mimi Harni<sup>#1</sup>, Rince Alfia Fadri<sup>#</sup>, Sri Kembaryanti Putri<sup>#</sup>

<sup>#</sup> Food Technology, Agricultural Polytechnic of Payakumbuh, Jl Raya Negara Km 7 Tanjung Pati, Payakumbuh, 26271, Indonesia  
E-mail: <sup>1</sup>mimiharni2009@gmail.com

**Abstract**— Wuak piuak is a kind of traditional food comes from Kapur IX, Limapuluh Kota Regency. It is usually presented in local traditional events. The Existence of this food unfortunately started to be disappeared and slowly not recognized by young generations.. It is expected by modifying this kind of food using cassava will make it known back. Complete Randomly Design (CRD) was used in this case by five treatments and three replications for organoleptic test. The test be assessed by asking which kind of most preferred product from some treatments of texture, colour, aroma, taste, appearance. The high value stated the most preferred product whereas the lowest value was most un-preferred one. Advanced test from data was done by using Duncan's New Multiple Range Test (DNMRT) at 5 % significance level. The result showed that the treatment by adding 100% of cassava was the most preferred and had high value of texture, aroma, colour and taste.

**Keywords**— Starch; Amylose; Amylopectin; Cassava; traditional food

### I. INTRODUCTION

*Wuak Piuak* is a kind of traditional food comes from Kapur IX, Limapuluh Kota Regency. It is usually presented in local traditional events. The Existence of this food unfortunately started to be disappeared and slowly not recognized by young generation. It is expected by modifying this kind of food using cassava will make it known back.

Wuak piuak is a mashed-rice basic ingredient food. Rice using in some traditional foods as based-ingredient just like Wuak piuak, encourage of rice consumption being higher. Reference [2] shows rice consumption data's for West Sumatera Area in the year 2009 is 1.315,2 kcal/capita/day. Government recommendation's just only 1000/kcal/capita/day, thus West Sumatera area exceeded 31,52%. The data is only for rice consumption as staple food. Many kind of traditional foods made from rice or rice-based ingredient will increase rice consumption higher. This condition encourages the government to issue a program of local foodstuffs use in decreasing rice consumption more over to make cake and others.

One of local foodstuff to be used is Cassava. Cassava production in Limapuluh Kota Regency area is quite high. The production of cassava is 62.482,62 ton with harvest area 1.350 ha [2] . . An high production can be seen by many

cassavas processing industries like *karak kaliang*, *sanjai*, *kerupuk ubi* (cassava chips) and others.

Rice and cassava are food ingredients as starch source that part of carbohydrate. But, the starches in that ingredients are different. To the rice, its amylose is higher and different amylopectin based on to the kind of rice. This causes the rice *pera* or not *pera* (*taste of rice*). Then, the amylopectin in the cassava is higher and even reaches 14 % [3] so that gelatinous process will produce no stiff gel but if the starch content is low it will produce stiff gel.

Cassava Using in traditional foods especially for Wuak piuak will change the characteristic of that food. That change is expected gives a better way to the product. The aim of this research with rice replacement to cassava is expected will produce better organoleptic and to be preferred by consumers.

### II. MATERIALS AND METHOD

#### A. Time and Place

This research had been done in processing and chemical laboratory of Agricultural Polytechnic State of Payakumbuh.

#### B. Materials

The material used in this research were purple sweet potato, sago and cooking oil.

### C. Research Design

Completely Randomize Design (CRD) was used in this case by five Treatments and three repetitions for organoleptic testing. That test to be assessed by asking which kind of product preferred most from some treatments of texture, colour, aroma, taste, appearance. The high value stated the most preferred product whereas the lowest value was un-preferred most one [1]. Advanced test from data was done by using *Duncan's New Multiple Range Test (DNMRT)* at 5 % real level.

The treatments were :

- No Addition of Cassava (control)
- Addition of 25 % Cassava
- Addition of 50 % Cassava
- Addition of 75% Cassava
- Addition of 100% Cassava

### D. Research Implementation

The rice soaked for about 30 minutes and the rice smooth mashed using a blender machine without sieving. Peeled the cassava, cleaned, grated to be smooth and squeeze till dry. Mixed the mashed\_rice with skimmed milk, vanilla, salt and evenly stirred it. Added grated cassava and evenly stirred it. Added 170ml of coconut milk next stirred it. Input one scoop of dough into the clean-washed pouch and blanched, next input pieces of palm sugar in the middle and covered by another dough. Steamed for about 30 minutes.

## III. RESULT AND DISCUSSION

### A. Texture

Investigation results showed that the treatment of cassava using in the making of Wuak Piuak took real effect to the texture produced (5% real level). This case could be seen on the Table 1 below :

TABLE I  
THE AVERAGE TEXTURE VALUES OF WUAK PIUAK

Treatments	Texture
E (Addition of 100% Cassava)	5,40 <sup>a</sup>
D (Addition of 75% Cassava)	3,70 <sup>b</sup>
B (Addition of 25% Cassava)	3,20 <sup>b</sup>
C (Addition of 50% Cassava)	2,80 <sup>b</sup>
A (No Cassava Addition)	1,50 <sup>c</sup>
CV = 32,9 %	

Numbers were followed by the same small letters on the same lines and the same capitals on the same rows unreal different based on DNMRT advanced test at 5 % real level.

From the table above the most preferred texture was treatment E by addition of 100% cassava whereas treatment D, B and C unreal different from each other because there was still addition of cassava and rice in rather rough measurement so that its texture considered be same according to the panellists. Wuak Piuak's texture by addition of 100% cassava (E) to be preferred because of high amylopectin content in cassava that was 14 % [4] . Amylopectin in Food Products stimulated puffing process where the products would be light, elastic whereas a starch with high amylose tend to produce hard products because puffing process was limited [5].

### B. Colour

Investigation Test showed that the treatment of cassava addition to Wuak Piuak took real effect to the colour of the products (5% real level). This case could be seen on the Table 2 below :

TABLE II  
AVERAGES COLOUR VALUES OF WUAK PIUAK

Treatments	Colour
E (Addition of 100% Cassava)	5,80 <sup>a</sup>
D (Addition of 75% Cassava)	4,40 <sup>b</sup>
C (Addition of 50% Cassava)	4,00 <sup>b</sup>
B (Addition of 25% Cassava)	3,90 <sup>b</sup>
A (No Cassava Addition)	3,10 <sup>c</sup>
CV = 21,09 %	

Numbers were followed by the same lowercase at the same lines and the same capital at the same rows were unreal different according to DNMRT continuation test at 5% real level.

On the Table 2 could be seen that the most preferred colour was the treatment by addition of 100% cassava (E). From the table also seen there was cassava effect to the colour produced, where between treatment D, C and B unreal different each other. This case was caused by the starch in the cassava and rice. Cassava had higher amylopectin so that in the heating process would be more transparent whereas to the rice with higher amylose would produce White after heating.

Reference [5] says that the changing while starch suspension heating will be occurred limpidity and viscosity increasing. At the heating continuous pasta's viscosity will increase little by little because the granule distension for more. This viscosity increase finally reaches the top and next the viscosity will decrease when occurred granule damage because of stirring. Finally the proportion reached between intact starch granules with starch granules cuts which spreaded out in colloid form.

Wuak piuak's colour beside to be effected by raw ingredients also to be effected by palm sugar addition got in the products so that rather brown if seen from outside. Reference [6] says that the colour formed at the palm sugar caused by non enzymatic Maillard browning reaction and caramelyze reaction. Mailard reaction is a reaction occurred between amino acid with sugar reductor when to be heated together, whereas caramelyze reaction is a reaction occurred at the time sugar heating in acid, alkali and no-water heating.

In the other hand case of colour also caused by pouch effect that used as package. Reference [7] says that upper pouch is green because chlorophyll content, while lower pouch covered by sun lights so that it is red. To the treatment addition of 100% cassava (E) and addition of 100% rice (A) the colour difference was very clearly seen.

### C. Aroma

Investigation test showed that the treatment of cassava addition in Wuak Piuak making took real effect to the aroma ( 5% real level). This thing could be seen on the Table 3 below :

TABLE III  
AVERAGES AROMA VALUES OF WUAK PIUAK

Treatments	Aroma
E (Addition of 100% Cassava)	5,10 <sup>a</sup>
D (Addition of 75% Cassava)	4,60 <sup>ab</sup>
B (Addition of 25% Cassava)	3,80 <sup>bc</sup>
C (Addition of 50% Cassava)	3,60 <sup>c</sup>
A (No Cassava Addition)	2,90 <sup>c</sup>
CV = 21,09 %	

Numbers followed by the same lowercase at same lines and the same capital at the same rows unreal different according to DNMRT continuation test at 5 % real level.

From the table above was seen that the most preferred aroma by panellists was the addition of 100% cassava (E). Wuak piuak's aroma was very effected by coconut milk addition, palm sugar and vanillin till covering the original aroma from cassava as well as rice. Treatment E and A clearly seen the aroma difference. Cassava's aroma less preferred by the consumer especially for dried-cassava. But in the making of Wuak Piuak, cassava had steaming process so that the original aroma would reduce moreover by addition extra ingredients and the aroma would be more fragrant.

In the food industry, coconut milk's role is very important as nutrient source, aroma addition, taste, flavour and texture recovery of food ingredients processed result. This thing caused by the coconut milk has nonylmethylketon compound, with a high temperature will cause volatile character and makes good smell [8]. Vanilin in the vanille is the most compound to the taste. To a fresh vanille the aroma compound is got as glucoside [9]

Palm sugar has specific aroma because there are organic acids content in it. In the other hand palm sugar has specific caramel aroma. The aroma caused by caramelize reaction because of heating while cooking [10].

#### D. Taste

Investigation test showed that cassava addition treatment to Wuak Piuak took real effect to the product's taste produced (5% real level). This thing cold be seen on the Table 4 below :

TABLE IV  
AVERAGES TASTE VALUES OF WUAK PIUAK

Treatments	Taste
E (Addition of 100% Cassava)	5,30 <sup>a</sup>
D (Addition of 75% Cassava)	3,80 <sup>b</sup>
C (Addition of 50% Cassava)	3,70 <sup>b</sup>
B (Addition of 25% Cassava)	3,60 <sup>b</sup>
A (No Cassava Addition)	1,70 <sup>c</sup>
CV = 21,09 %	

Numbers followed by the same lowercase at same lines and the same capital at the same rows unreal different according to DNMRT continuation test at 5 % real level.

On the table 4 could be seen that the most preferred taste was addition of 100% cassava (E). Treatment B unreal different each other with treatment B and C but by addition of cassava the texture became more elastic so would give good taste to the panellists. Whereas the coconut milk felt

more to the mashed-rice, the possibility panellists who had the test less of concentration in doing it. Cassava taste generally less preferred by consumers but cassava godah would have steaming process till the original taste covered by coconut milk addition, salt and palm sugar which made it more tasty.

Food ingredients if to be processed with addition of another ingredients will get to produce specific aroma and flavour that covered the real aroma and flavour from its raw ingredients that inclined make the consumers feel uncomfortable [11].

Palm sugar has sweet taste. The sweet taste caused by some contents of sugar like sucrose, fructose, glucose, and malt. Sweetness value especially caused by fructose in palm sugar that has higher sweetness value than sucrose. Palm sugar also has a bit sour taste. This caused by organic acids in it. The organic acids cause the palm sugar has specific aroma, a bit sour and caramel smell [12].

Reference [13] says that coconuts are usually utilized as food ingredient, one of it the making of coconut milk which can create savory taste if to be mixed with another food ingredients become certain dishes.

#### IV. CONCLUSIONS

Based on the research done to some treatments in the making of Wuak Piuak, could be got some conclusions : There was cassava effect to the organoleptic testing from Wuak Piuak produced. Preferred treatment (Highest value) in organoleptic testing was addition of 100% cassava (E)

#### ACKNOWLEDGMENT

We would like to thank the Higher Education (Directorate General of Higher Education) who have financed this study as well as the P3M of Agricultural Polytechnic State of Payakumbuh that has facilitated this activity. thank you to all the colleagues who have helped this research so that it can run properly.

#### REFERENCES

- [1] W.P. Rahayu, *Penuntun Praktikum Penilaian Organoleptik*. Jurusan Teknologi Pangan dan Gizi Fakultas Teknologi Pertanian, Institut Pertanian Bogor, 1998
- [2] Dodo. (2010). Masyarakat Sumbar Terlalu Banyak Konsumsi Beras. [Online]. Available: <https://padangmedia.com>.
- [3] BPS. 2013. *Limapuluh Kota Dalam Angka*. Limapuluh Kota.
- [4] SE Ben, Zulianis, A Halim, "Studi Awal Pemisahan Amilosa dan Amilopektin Pati Singkong dengan Fraksinasi Butanol Ai"r, Fakultas Matematika dan Ilmu Pengetahuan Alam. 2011
- [5] Supriyadi. 2012. Pengaruh Rasio Amilosa dan Amilopektin dan Kadar Air Terhadap Kerenyahan dan Kekerasan Model Produk Gorengan. Institut Pertanian Bogor.
- [6] Dyanti, R. 2002. Studi Komparatif Gula Merah Kelapa dan Gula Merah Aren. Skripsi Jurusan Teknologi Pangan dan Gizi. Fakultas Teknologi Pertanian, IPB. <https://jpa.ub.ac.id>. Bogor.
- [7] Witarto. 2006. Protein Pencerna di Kantong Semar. Koran Tempo Hari Kamis, Tanggal 19 Januari 2006. <https://witarto.wordpress.com>. Jakarta.
- [8] Khairulanam. 2010. Santan Kelapa. <https://khairulanam.wordpress.com>. Didownload pada Tanggal 27 Februari 2015.
- [9] Dignum, M.J.W., J. Kerler and R. Verpoorte. 2003. *Vanilla Curing Under Laboratory Conditions*. Food Chem. 79: 165 -171.
- [10] Sutrisno, C.D.N dan W.H, Susanto. 2014. Pengaruh Penambahan Jenis dan Kosentrasi Pasta (Santan dan Kacang) terhadap Kualitas Produk Gula Merah. Jurnal Pangan dan Agroindustri Vol. 2 No. 1 p.97-105, Januari 2014. <http://jpa.ub.ac.id>.

- [11] Smaemunah. 2012. Sekilas tentang Mocaf. Mutiply.com. (Artikel tersebut di-download pada Tanggal 12 Desember 2012).
- [12] Nengah, I. K. P. 1990. Kajian Reaksi Pencoklatan Termal pada Proses Pembuatan Gula Merah Aren. Tesis. Program Studi Ilmu Pangan, Pasca Sarjana. IPB. Bogor
- [13] Srihari, E, F.S. Lingganingrum, R. Hervita, H.Wijaya. 2010. Pengaruh Penambahan Maltodekstrin Pada Pembuatan Santan Kelapa Bubuk. Makalah Seminar Rekayasa Kimia dan Proses Tanggal 4 Agustus 2010. <http://undip.ac.id>