Madani: Jurnal Ilmiah Multidisiplin
Volume 1, Nomor 9, Oktober 2023, Halaman 233- 239

E-ISSN: 2986-6340
DOI: https://doi.org/10.5281/zenodo.10017747

Utilization of Kepok Banana Peel Waste as Composite Ingredients of Kenari (Kepok Banana Crispy) for Approaching Novel Food and Waste Management Sustainability Using Organoleptic Testing

Chandra Halim.M, S.Si[1], Hikmah AR, S.Pd[2], Dra. Maisarah[3]
[1]Physics Teacher in Islamic State School 01 Bener Meriah
[2]Chemistry Teacher in Islamic State School 01 Bener Meriah
[3]Biology Teacher in Islamic State School 01 Bener Meriah
email: chandra.halim.m@mail.ugm.ac.id[1], hikmahar73@gmail.com[2] , sarahmaisarah@gmail.com[3]

Abstract
Waste is conventional problem that worsens the environmental conditions of society in Indonesia. Either inorganic or organic waste has the same role reducing the public health quality. Organic waste is easier to be processed into more useful products such as snacks. One of the organic wastes is banana peel waste. Banana peel is economic-accessible waste with large amounts of substances which is feasible managed into food products. One of the food products is crackers. Crackers are the most favorite snack in Indonesia. This research aims to utilize banana peel into crackers to increase food variation and reduce the organic waste in environment. The research methods were experimental, interviews and literature study. As the result, the highest assessment crackers achieved by 1:1 variation (tapioca flour: banana peel) with 492 points (outstanding) followed by 1:2 variation with 453 points (very good). The lowest assessment crackers achieved by 2:1 with 373 points (good). The difference of each variation depends on the taste, aroma and texture assessment. Providing banana peel to cracker mixture affects the parameter assessment as the variation 1:1 provides more crunchiness, aroma banana like and savory taste. Gradually, unbalanced variation such as 1:2 and 2:1 variation provides less crunchiness and savory taste. Banana peel waste can successfully add savory taste, crunchiness and interesting aroma of the cracker and increase society income since the cracker ingredient is more affordable. Therefore, banana peel waste can be utilized as the addition of cracker mixture in order to minimize the organic waste in Indonesia.
Keywords: *Crackers, Kepok Banana Peel, Organic Waste, Organoleptic Test.*

Article Info
Received date: 15 September 2023 Revised date: 26 Sept. 2023 Accepted date: 13 Oktober 2023

INTRODUCTION

Until now, a conventional/hereditary problem that is often encountered, namely waste is still a problem that worsens the environmental conditions of society, especially Indonesia. Starting from inorganic waste such as plastics and batteries to organic waste such as vegetable, fruit and household waste, they have the same role in reducing the quality of public health. Based on data from the Ministry of Environment and Forestry (KLHK) 2019, the dominant waste is organic waste with a composition of around 60%, followed by plastic waste with 14% and paper waste amounting to 9% in the third position. Based on the processing, this type of inorganic waste takes a long time to decompose so that the probability of processing it into other products is classified as difficult. On the other hand, organic waste such as fruit and vegetable waste tends to be easier to process into more useful products such as liquid fertilizers, snacks to complementary food ingredients for the manufacture of a product (Anif, 2018). Waste that has the potential to be processed is banana peel waste. Banana peel waste is a type of waste that is quite easy to find in the community. Data shows that banana productivity in Indonesia reaches 6,862,558 tons or around 34.65 percent of the total fruit production in Indonesia (Ministry of

Agriculture of the Republic of Indonesia, 2014). In everyday life, people use banana meat which is sweet and delicious and rich in vitamins than banana peels (Hidayati and Suhartini, 2018). For every 100 g of fresh banana fruit, there is an energy content of 91 kcal, 33 mg of magnesium, 35 mg of phosphorus, 20 mg of vitamin C and other minerals (Aurore et al., 2009). Meanwhile, the nutritional content of banana peels is 91.50% organic matter, 0.90% protein, 1.70% crude

lipids, 59% carbohydrates, and 31.70% crude fiber (Anhwage et al, 2009). Due to the large amount of substances that can still be used, banana peel waste is feasible to be managed into other food products. One of the foods that can be made is crackers. Crackers are snacks that are generally used as a snack in almost every Indonesian society. Crackers are a type of dry food that contains high tapioca flour because they are generally made from tapioca flour. Crackers have many varieties, ranging from taste and shape (Yasin, 2018). What distinguishes the taste and quality of the crackers are the main ingredients such as rice, wheat flour, or tapioca flour, additives or spices, and of course the manufacturing process (Rohaendi, 2009). With this research, the community is expected to be able to utilize banana peel waste into other food products such as crackers to add variety to food and reduce the number of organic waste in Indonesia.

By utilizing banana peels in addition to reducing waste, it will increase its economic value and will complement the diversification of foodstuffs and develop the use of local foodstuffs to enter the global market so that it can help increase people's income, especially home industries (Julfan, et.al., 2016). Thus, it means that there are no more parts of the banana plant that are not used, by utilizing all parts of the banana plant, it means that there aremore alternative food choices for consumption (Munadjim, 2013).

In this research, an experiment about KENARI (Kepok Banana Crispy) will be carried out as an alternative solution for the processing of banana peel waste in making nutrient-rich crackers. This banana peel will be combined in composition against tapioca flour to get the right variety of some of the best crackers. Therefore, this research will be helpful to overcame the numerous amount of waste especially organic waste in Indonesia.

Research related to banana peel waste is quite common as the object of research studies and there have been a number of studies that have been carried out previously related to the use of banana peel waste such as in the research of banana peel waste conducted by Ermawati et al (2016) regarding the effect of substitution of Kepok banana peel flour (Musa Paradisiaca L) on fiber content and cookie acceptance which was carried out aimed at measuring the yield of banana peel flour produced in the process of making cookies using the sun drying method, analyzing the comparison of the best formulation of Kepok banana peel flour substitution in cookies, and analyzing the level of panelist acceptance of the resulting cookies. The design used in this study was a completely randomized design with 4 substitution treatments of wheat flour and kepok banana peel flour then continued with analysis of moisture content and fiber content. In each treatment, the organoleptic test was analyzed (taste, aroma, texture and color) and the data obtained were tested by ANOVA and advanced DMRT tests to determine the effect of treatment on each cookie treatment. The results showed that the characteristics of Kepok banana peel flour with the best treatment were 75% wheat flour and 25% Kepok banana peel flour with 2.13% water content and 15.34% fiber content (Pary, dkk., 2016). Based on the results of the acceptance test, the use of kapok banana peel flour of 75%, 25% of Kepok banana peel flour was preferred by the panelists.

Further research related to the manufacture of banana peel crackers is a study conducted by Nur H. Anggriyani, et al. 2016. This research was conducted to find out how much the addition of the best M. pruriens flour can increase the value of protein content and get the characteristics of banana peel crackers that are organoleptically acceptable. This study

used a randomized block design (RBD) with a factorial 6x1 with 4 repetitions in order to obtain 24 treatments. One factor research was the addition of M. pruriens flour which consisted of 6 levels. the responses tested included color, taste, and crunchiness. The results showed that the addition of M. pruriens flour was 10% based on the organoleptic properties of the best taste parameters, with the resulting moisture content of 8.81%, protein content of 4.54%, starch content of 33.35%, ashcontent of 1.51%, HCN content. amounted to

0.00 mg / kg and swelling power of 78.75%. The addition of the concentration of koro flour has an effect on the characteristics of banana peel crackers which include protein content, flower power, organoleptic parameters of color, taste, and crunchiness. Research shows that increasing the percentage of M. pruriens flour by up to 15% increases the protein content, flower power, and crunchiness. However, the addition of the concentration of koro flour did not affect the water content of banana peel crackers.

However, the variations in output (product results) that exist so far are still limited to test methods that only involve one aspect. So based on this research, there is a novelty that will be carried out in this study, namely by using a combination of tapioca flour and kepok banana peel waste. And in this study will use parameters in terms of aroma, texture and taste in making crackers based on variations in composition.

Research Objectives

Based on the problem statement above, this research was carried out with the following objectives to investigate the effect of adding banana peels in making crackers in terms of taste, aroma and texture; to investigate the best variation between tapioca flour and banana peelin order to get the best crackers in terms of taste, aroma and texture

METHODOLOGY

Tools and Materials

The tools used in this study were a knife, spoon, large bowl, frying pan, spatula, gas stove, coconut filter, oil scraper, belender, sugar plastic and a scale. The materials used in this study were tapioca flour, banana peel,cooking oil, garlic, lime salt, and water

Research Variables

a. Independent Variables

The independent variable is the variable that affects or causes the change or the emergence of the dependent (dependent) variable (Sugiyono, 2014). The independent variables in this study were tapioca flour and banana peel, which were varied based on composition. Variations were made as much

- Tapioca flour: Banana peel (1: 1)
- Tapioca flour: Banana peel (1: 2)
- Tapioca flour: Banana peel (2: 1)

b. Dependent Variables

The dependent variable is the variable that is affected or that is the result, because of the independent variable (Sugiyono, 2014). The dependent variable in this study is the crackers which are seen based on:

1. The taste of crackers
2. The aroma of crackers
3. The texture of the crackers

3. Research Steps

This research was conducted in four stages, the first stage was the preparation stage which included the manufacture of the basic ingredients of Kepok banana peels. The second stage is the stage of making variations of tapioca flour and banana peel of Kepok. The third stage is the stage of making crackers (Naf'an, 2012). Furthermore, the last stage is the testing phase in the form of interviews with crackers. The research stages are described as follows.

The research stages are described as follows.

a. Preparation Stage

First, the waste banana peel is washed clean. then the banana peel waste is cut into small pieces. After that the pieces of banana peel waste are boiled by adding enough lime. After boiling, crushed banana skin pieces in a blender. After mashed, banana peels are filtered and ready to use

b. Stage of Making Variation

First, Kepok banana peel dough and tapioca flour are prepared. Then, the mass of banana peel dough and tapioca flour was measured using analytical scales. Furthermore,the variation in composition was adjusted bycomparing the composition of the banana peel mixture with tapioca flour. The composition variation is done by comparison

c. Stage of Making Crackers

First, the flour is put into a bowl filled with banana peel dough according to the predetermined variations. Then salt and garlic that have been blended are put into the dough and stirred until evenly distributed and the dough is molded. After forming the donut, the dough is steamed over medium heat. Then the dough is dried in the sun 1 day 1 night then the dough is ready to be fried and served.

d. Testing Stage

Crackers and research questionnaires were prepared in advance. Questionnaires and crackers were presented to the panelists to be assessed in terms of taste, aroma and texture aspects. Assessment was carried out for all varieties of crackers. Research data for each variety of crackers were obtained and statisticaldescriptive tests were performed.

RESULTS AND DISCUSSION

Research Data

In this study, three variations of the composition of mixing tapioca flour with kapok banana peel were varied. The variations carried out were variation 1 with a ratio of tapioca flour and kapok banana peel respectively 1: 1, variation 2 with a ratio of 1: 2 and variation 3 with a ratio of 2: 1. After varying the composition, all the ingredients are processed into crackers so that organoleptic tests can be carried out by distributing questionnaires to 30 respondents. These respondents assessed using a Likert scale, namely (1) very bad (2) bad (3) moderate (4) good (5) very good (6)outstanding. All data can be seen in table 1 below:

Information:

Table 1. The Result of 30 Respondents Questionnaires

No	Variation	Taste	Texture	Aroma	Total
1	Crackers 1:1	171	162	159	492
2	Crackers 1:2	156	147	150	453
3	Crackers 2:1	129	121	123	373

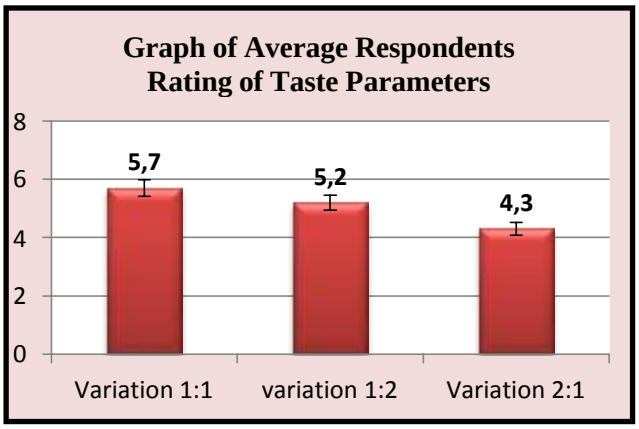
Assessment of each parameter:

30 – 55 : very bad
55 – 80 : bad
80 – 105 : moderate
105 – 130 : good
130 – 155 : very good
155 – 180 : outstanding

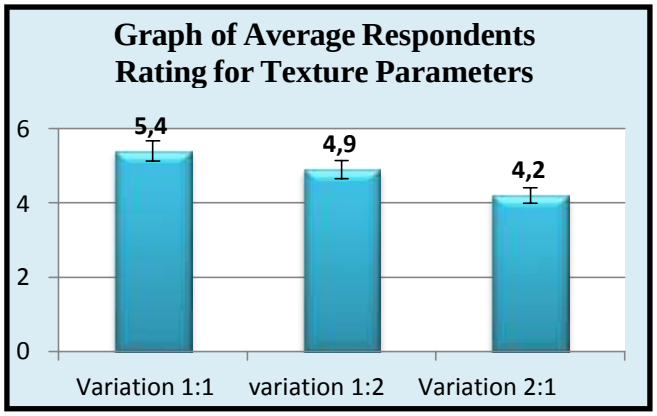
Furthermore, the research data will be explained and carried out by organoleptic analysis and descriptive statistics in order toobtain accurate research results.

Research Graph

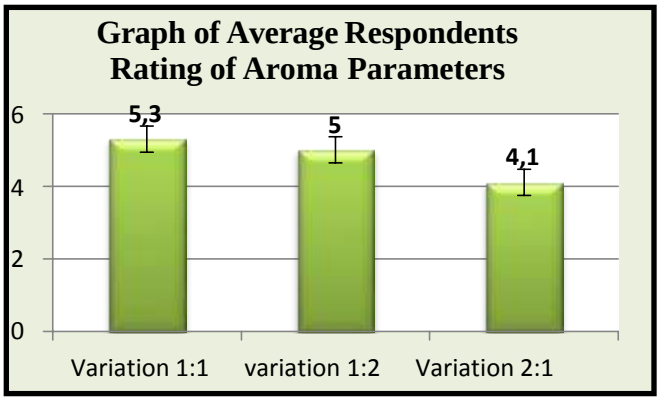
It has been explained that previously the organoleptic test data that had been obtained from the distribution of questionnaires to 30 respondents would be analyzed and presented by a graph which can be observed below:



(a)scale, namely (1) very bad (2) bad (3) moderate(4) good (5) very good (6) outstanding. Theoverall data obtained can be seen in table 2.



(b)



(c)

Figure (a). Graph of Average RespondentsRating of Taste (b). Graph of Average Respondents Rating of Texture and (c) Graph of Average Respondents Rating of Aroma on Crackers

Discussion

This study aims to determine the effect of adding banana peels in the manufacture of crackers and to determine the appropriate variation between tapioca flour and banana peels in order to obtain the best crackers in terms of taste, aroma and texture. In determining the appropriate variation, 3 variations of the composition of the mixing of tapioca flour and kapok banana peel were carried out. The variations carried out were variation 1 with a ratio of tapioca flour and kapok banana peel respectively 1: 1, variation 2 with a ratio of 1: 2 and variation 3 with a ratio of 2: 1. After varying the composition, all the ingredients are processed into crackers so that organoleptic tests can be carried out by distributing questionnaires to 30 respondents. These respondents assessed using a Likert

Table 2. Results of Distributing Questionnaires to 30 Respondents

No	Variation	Parameters		
		Taste	Texture	Aroma
1	Variation 1:1	5,70 ± 0,47	5,40 ± 0,50	5,30 ± 0,47
2	Variation 1:2	4,90 ± 0,55	5,00 ± 0,59	4,30 ± 0,70
3	Variation 2:1	4,30 ± 0,70	4,20 ± 0,66	4,10 ± 0,66

From the **table 1,** the highest assessment crackers achieved by 1:1 variation (tapioca flour: banana peel) with 492 points (outstanding) followed by 1:2 variation with 453 points (very good). The lowest assessment crackers achieved by 2:1 with 373 points (good). The difference of each variation depends on the taste, aroma and texture assessment. Providing banana peel to cracker mixture affects the parameter assessment as the variation 1:1 provides more crunchiness, aroma banana like and savory taste. From the **table 2**, the differences between each variation is represented in one graph. As the figure (a), variation 1:1 holds the highest average assessment with 5,70 ± 0,47 also appears in the figure (b), variation 1:1 hits the average 5,40 ± 0,50. Nevertheless, the highest average assessment is also obtained by variation 1:1 which has 5,30 ± 0,47. For all parameters, variation 1:1 is the best result in this research based on descriptive statistics and sum of all respondent assessments for each parameter. Gradually, unbalanced variation such as 1:2 and 2:1 variation provides less crunchiness and savory taste. Banana peel waste can successfully add savory taste, crunchiness and interesting aroma of the cracker and increase society income since the cracker ingredient is more affordable. Therefore, banana peel waste can be utilized as the addition of cracker mixture in order to minimize the organic waste in Indonesia.

Conclusion

The addition of banana peels to the tapioca flour mixture can increase the appetizing aroma of bananas, savory taste and crunchy texture and the best composition variation for this research achieved by 1: 1 variation (tapioca flour Flour: banana peel waste) which hits 492 points (outstanding) in a total of assessment followed by 1:2 variation with 453 points (very good).

References

Anggrainy, NH. 2016. Kajian karakteristik kerupuk kulit pisang ambon (Musa paradisiaca L) yang diperkaya dengan penambahan tepung kacang koro pedang (Cannavalia

ensiformis). Skripsi. Bandung: Fakultas Teknik. Universitas Pasundan

Anhwage, M., Bhat, R. And Karim, A.A., 2017. Antioksidant Capacity And Phenolic Content Of Selected Tropical Fruit From Malaysia, Extracted With Different Solvent. Food Chemistry, 115, Pp.785-788.

Anif, S., Rahayu, T. And Faatih, M., 2018. *Pemanfaatan Limbah Tomat Sebagai Pengganti Em-4 Pada Proses Pengomposan Sampah Organik*

Aurore, G., Parfait, B. And Fahrasmane, L., 2017. *Bananas, Raw Materials For Making Processed Food Products. Trends In Food Science & Technology, 20(2), Pp.78-91.*

Ermawati, W.O., 2016. Kajian Pemanfaatan Limbah Kulit Pisang Raja (Musa Paradisiaca Var Raja)Dalam Pembuatan Es Krim. Jurnal Sains Dan Teknologi Pangan, 1(1).

Hidayati, TN and Suhartini. 2018. Analisis daya saing ekspor pisang (Musa Paradiaca L.) Indonesia di pasar Asean dalam menghadapi Masyarakat Ekonomi Asean (MEA). Jurnal EkonomiPertanian dan Agribisnis (JEPA), 2(4): 267-278

Julfan., Harun, N., and Rahmayuni. 2016.Pemanfaatan kulit pisang kepok (Musa paradisiaca Linn) dalam pembuatan dodol. Jurnal Teknologi Pertanian 3(2) : 1-12

Kementerian Lingkungan Hidup Dan Kehutanan (Klhk), 2019. Gerakan Nasional Pilah Sampah Dari Rumah Resmi Diluncurkan Ministry Of Agriculture Of The Republic Of Indonesia

Munadjim, 2013. Effect Of Packaging And Length Of Storage On Total Plate Count (Tpc) Of Microbial Organoleptic Flour Properties Gablok Kepok Banana (Musa Paradisiaca Balbisiana) Sekolah Tinggi Ilmu Pertanian Semarang 2) Universitas Semarang

Naf'an. 2012. Proses Produksi Kerupuk Kulit Pisang. Laporan Tugas Akhir DIII. Surakarta: Universitas Sebelas Maret.

Pary, C., Masita., Safitrah, A., Nurfadillah, M., dan Setiyawati, E. 2016. Analisis kandungan gizi limbah kulit pisang kepok (Musa paradisiaca Formatypica) sebagai bahan baku kerupuk. Jurnal Biology Science & Education, 5(1): 112-123

Rohaendi, 2013. Memproduksi Kerupuk Sangrai

Sugiyono. 2014, Metode Penelitian Kuantitatif, Kualitatif, Dan Kombinasi (Mixed Methods), Bandung : Alfabeta

Yasin, N. 2018. Pengaruh penambahan tepung pisang pada pembuatan kerupuk. Gorontalo AgricultureTechnologyJournal,1(1)49-58