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The Characteristics of Wet Noodles from Mocaf Flour and Moringa Flour

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A B S T R A C T

This study aims to determine the effect of substituting mocaf flour for moringa leaf flour on the characteristics of wet noodles. The research method used a completely randomized design on a factorial pattern, namely the ratio of wheat flour to mocaf flour, consisting of 4 levels: (100:0), (90:10), (80:20), (70:30), and the addition of moringa leaf flour, which consists of three levels: (10%), (15%), and (20%). The results showed that the best substitution of mocaf flour and moringa leaf flour with a ratio of 70% wheat flour to 30% mocaf flour and leaf flour to 10% moringa yielded 71.467% moisture content and 13.249% protein content. Ash content of 1.359% does not meet SNI but is still accepted by consumers. swelling index 32.723%, color (L*) 39.580%, color (a*) -8.380%, and color (b*) 14.410%.

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INTRODUCTION

As a food product that is widely consumed by Indonesian people, noodle products in the form of wet noodles, dry noodles, and instant noodles have now become the second main food ingredient for Indonesian people after rice. The practical nature of noodles makes it easier for consumers to process them into various dishes. Noodles are usually made from wheat flour which their raw material is wheat. Indonesia has been forced to import wheat in large quantities to meet the need for wheat flour as wheat is difficult to develop in Indonesia (Nevara, 2018).

Consumption of noodles may reduce the country's foreign exchange because noodles are made from wheat flour which is an imported commodity. Efforts that can be made to reduce imports of wheat are by making use the local food ingredients such as mocaf flour as a substitute for wheat flour.

Mocaf is a derivative product of cassava flour which uses the principle of modification by fermentation using lactic acid bacteria. The fermentation treatment causes changes in the characteristics of the resulting flour, namely increased viscosity, gelation ability, rehydration power and ease of dissolving. In addition, Mocaf has a higher complex carbohydrate content than wheat, which is 87.3%. The fiber content in Mocaf is also higher than flour (Salim, 2007). However, Mocaf has a high amelopectin content of around 75% (Elliason, 2004) so that it can give a sticky texture to the resulting product.

Moringa leaves (Moringa oleifera) in various studies are known to be used as antioxidants. Moringa oleifera which is a family of Moringaceae has antioxidant content including, sapoins, alkaloids, phytosterols, tannins, phenolics and flavonoids. Furthermore, Quercetin, which is the largest flavonoid belonging to the flavonol class, has an antioxidant effect that can prevent free radicals from increasing. The use of Moringa leaves as a supplement in making wet noodles is expected to increase its nutritional content, so that it can supply nutritional value and can be functional food for consumers who consume wet noodles. Most people only know that wet noodles are mostly added with vegetables such as mustard greens and carrots in the dough. By utilizing the abundant moringa leaves in Indonesia, the noodles produced will contain antioxidant compounds so that they can function as functional food.

Therefore this research was conducted to find out what is the ratio of mocaf flour to moringa leaf flour to produce noodles with characteristics that consumers like and meet the SNI for wet noodles. This research is expected to provide information about the characteristics of wet noodles substituted for mocaf flour and moringa leaf flour which can be developed for the processing industry. In addition to providing information to the public that noodles can be made using ingredients other than wheat flour and to get to know the benefits of mocaf flour and moringa leaf flour.

THEORETICAL REVIEW

Noodles are a food ingredient made from wheat as the main raw material. Noodles do not include authentic Indonesian food when viewed from the raw materials. Noodles are known as noodles in English, in Japanese they are called

ramen, udom, kismen, while in Italian they are known as spaghetti (Astawan, 2008). The first noodles were made and developed in mainland China and are still famous as oriental noodles. Then the noodle technology was introduced by Marcopolo to the nobles in Italy and then spread to France, and then to the rest of Europe. At this time noodles have been known in various countries around the world, including Indonesia. Many types of noodles are produced, but in the simplest ingredients noodles are always made from flour because it belongs to a type of food group called pasta, which is food made from dough of flour, water and salt (Astawan, 2008).

Noodles are a type of pasta made from wheat flour with or without the addition of eggs or egg yolks. Twist-shaped noodles with a diameter of 0.1779-0.317 cm. Noodles have several advantages in terms of taste, texture, appearance and convenience and practicality in serving. Generally, noodles are rich in carbohydrates and energy (energy) with low protein content. The nutritional content of noodles varies depending on the type, quantity, and quality of the ingredients and how they are made. In principle, noodles are made in the same way, but there are several types of noodles known in the market, such as fresh or raw noodles, wet noodles, dry noodles, and instant noodles (Astawan, 2008).

METHODOLOGY

The main ingredients used in making noodles were wheat flour, mocaf flour, and moringa leaf flour, eggs, clean water, salt, and palm cooking oil. The materials used in the analysis were BSA 0.3 mg/ml, Lowry's reagent A, Lowry's reagent, Lowry's reagent E, Lowry's reagent D, and Aquades (protein content analysis). The equipment used in this research included: sample making equipment and equipment for analysis.

The method used in this study was a completely randomized design (CRD) factorial pattern with 2 factors. Factor I, the ratio of wheat flour and mocaf flour which consisted of 4 levels, namely: (100:0) %, (90:10) %, (80:20)%, (70:30)%. Factor II, the treatment of adding moringa leaf powder consisted of 3 levels, namely: (10%), (15%), (20%). From this treatment, there were 24 experimental units with 2 repetitions.

The stages of making wet noodles in this study were as follows:

a. Preparation of tools and materials.
b. Dough making. After the materials and tools were ready, the wheat flour, mocaf flour, moringa leaf flour and other ingredients were then mixed according to the specified treatment. After that, the dough was kneaded until smooth.
c. Dough rest. The dough was then covered with an airtight plastic for 10 minutes. The aim was to keep the dough moist and to distribute the water in the dough evenly so that the dough would not dry out and break easily when rolling.
d. Milling and cutting. Once the dough was ready, it was then milled starting from a large thickness, namely size 1; then continue to thin out until size 3. After that, the dough is then cut. Before doing the rolling and cutting, the

dough was first plated with flour with the aim that the dough would not stick to the rolling and cutting tools.

e. Noodle boiling. The dough that has been cut was boiled at 100^{o}C for 3 minutes.
f. Oil smearing. The cooked noodles are drained, then smeared with oil with the aim that the noodles are not sticky and stick to one another. Then proceed with the analysis.

The data that has been obtained from the results of the study were analyzed using the method of analysis of variance. In order to obtain objective data, if a real or very significant treatment effect was obtained, then the Least Significant Difference Test (0.05% BNT) was done to find out the different pairs. Meanwhile, for subjective data, the Duncan test was administered.

RESULTS AND DISCUSSION

Moisture Content

The highest value of water content in the treatment of wheat flour was in the treatment of 80% wheat flour and 20% mocaf flour with an average value of 71.121% and the lowest was found in the treatment of 100% wheat flour and 0% mocaf flour with an average value of 63.261%. In the treatment of the addition of Moringa leaf powder, the lowest water content was in the treatment of adding 15% Moringa leaf powder with an average value of 66.751%, while the highest value was found in the treatment of adding 20% Moringa leaf powder with an average value of 68.825%. Although statistically the treatment ratio of wheat flour, mocaf flour and Moringa leaf flour had no significant effect on the water content of wet noodles, from Table 1 it can be seen that the higher the ratio of mocaf flour and Moringa leaf flour showed a tendency to increase the water content in wet noodles. This is due to the presence of gluten in flour, gluten occurs due to mixing wheat flour and water (Anam et al, 2010).

Table 1. The Effect of Comparison of Wheat Flour and Mocaf Flour with the Addition of Moringa Leaf Flour on the Moisture Content of Wet Noodles

Comparison of Wheat Flour and Mocaf Flour	Addition of Moringa Leaf Flour			Mean	
	10%	15%	20%		
100% : 0%	69,145	54,098	66,540	63,261	a
90% : 10%	66,601	67,183	73,156	68,980	a
80% : 20%	71,461	74,400	67,501	71,121	a
70% : 30%	67,875	71,320	68,104	69,100	a
Mean	68,770a	66,751a	68,825a		

Note: The same letter after the average value in the same column indicates a difference that is not significant (p>0.05)

Ash Content

Ash is a measure of the organic components present in a food ingredient. The ash content is not always equivalent to the mineral material lost during combustion and evaporation (Astawan, 2003). The results of the analysis of ash content in wet noodles can be seen in Table 2.

Table 2. The Effect of Comparison of Wheat Flour, Mocaf Flour with the Addition of Moringa Leaf Powder on Ash Content of Wet Noodles

Comparison of Wheat Flour and Mocaf Flour	Addition of Moringa Leaf Flour			Mean
	10%	15%	20%	
100% : 0%	1,235	1,338	1,415	1,329 a
90% : 10%	1,270	1,431	1,415	1,372 a
80% ; 20%	1,356	1,276	1,455	1,362 a
70% : 30%	1,388	1,363	1,479	1,410 a
Mean	1,312b	1352 b	1,441 a	

Note:

1. The same letter in the same line beside the mean value indicates a difference that is not significant ($p>0.05$).
2. The different letters behind the average value in the same column below the average value indicates a significant difference ($p <0.05$) to very significant ($p <0.01$).

The lowest ash content was obtained in the comparison treatment of 100% wheat flour, 0% mocaf flour with an average value of 1.329% and the highest was found in the treatment of a comparison of 70% wheat flour, 30% mocaf flour with an average value of 1.410%. In table 3.2 it can be seen that the lowest addition of Moringa leaf flour was found in the addition of 10% Moringa leaf flour with an average value of 1.312% and the highest was in the addition of 20% Moringa leaf flour with an average value of 1.441%. However, this was not in accordance with the Indonesian National Standard (SNI No. 2987-2015) which states that the maximum ash content in cooked wet noodles is 0.05%. The high value of the ash content was influenced by the inorganic components in flour and Moringa flour. Moringa leaf powder has an ash content of 0.2 per 100 g of dry matter (Luthfiyah, 2012).

Protein Content

Based on Table 3, it can be seen that the lowest comparison treatment of wheat flour and mocaf flour on the protein content of wet noodles was in the treatment of a comparison of 70% wheat flour and 30% mocaf flour with an average value of 10.732%. in addition, the highest value was found in the treatment with a comparison of 100% wheat flour and 0% mocaf flour with an average value of 12.165%. The amount of mocaf flour substitution used in making wet noodles greatly affects the protein content. The protein content of

mocaf flour was lower than that of wheat flour so that the value of the protein content decreased in each treatment. According to (Hersoelistyorini (2015), the protein content of mocaf flour is 1.949%.

Tabel 3. The Effect of Comparison of Wheat Flour, Mocaf Flour with the Addition of Moringa Leaf Powder on Protein Content of Wet Noodles

Comparison of Wheat Flour and Mocaf Flour	Addition of Moringa Leaf Flour			Mean	
	10%	15%	20%		
100% : 0%	13,991	12,273	10,231	12,165	a
90% : 10%	13,110	12,217	9,700	11,675	a
80% : 20%	13,249	9,765	9,763	10,926	a
70% : 30%	12,003	10,308	9,907	10,739	a
Mean	13,088 a	11,141 b	9,900 c		

Note:

1. The same letter in the same line beside the mean value indicates a difference that is not significant (p>0.05).
2. The different letters behind the average value in the same column below the average value indicates a significant difference (p <0.05) to very significant (p <0.01).

In the treatment of adding Moringa leaf powder, the lowest protein content was found in the treatment of adding 20% Moringa leaf powder with an average value of 9.900%. On the other hand, the highest protein content in the treatment of adding moringa leaf powder was highest in the treatment of adding 10% moringa leaf powder with an average value of 13.088%. The protein content decreased in the addition of Moringa leaf flour due to the presentation of mocaf flour used which is higher than Moringa leaf flour, the protein content of mocaf flour is 1.949% (Hersoelistyorini, 2015). Meanwhile, the protein content of Moringa leaf flour is 27.1 g / 100 g (Luthfiyah, 2012).

Swelling Index

The average swelling index value for wet noodles in comparison to wheat flour, mocaf flour with the addition of moringa leaf flour can be seen in Table 4. It can be seen that the highest swelling index value was found in the comparison treatment of 90% wheat flour and 10% mocaf flour with an average value of 31.563 %, while the lowest was found in the comparison of 100% wheat flour and 0% mocaf flour with an average value of 26.481%.

In Table 3.4 it can be seen that the highest treatment of adding Moringa leaf powder was in the treatment of adding 10% Moringa leaf powder with an average value of 30.025%, while the lowest was in the treatment of adding 15% Moringa leaf powder with an average value of 26.687%. The more addition of moringa leaf flour will affect the level of development of wet noodles. Trisnawati (2015) stated that the more protein concentrate added to Moringa

leaves, the swelling power of the noodles increased for mocaf substituted dry noodles.

Table 4. The Effect of Comparison of Wheat Flour, Mocaf Flour with the Addition of Moringa Leaf Flour on the Swelling Index

Comparison of wheat flour and mocaf flour	Addition of Moringa Leaf Flour						Mean	
	10%		15%		20%			
100% : 0%	28,005		29,227		22,211		26,481	a
90% : 10%	30,096		27,370		37,222		31,563	a
80% : 20%	32,723		21,207		29,765		27,898	a
70% : 30%	29,277		28,943		30,240		29,487	a
Mean	30,025	a	26,687	a	29,859	a		

Note: The same letter after the average value in the same column indicates a difference that is not significant (p>0.05).

Color, Color Reader Method

Brightness level (L)*

(L*) indicates the level of brightness in a sample. The value (L*) ranges from 0 (black) to + 100 (white). The closer to the +100 value, the whiter the color of the object. The average value of the brightness level (L*) for wet noodles can be seen in Table 5.

Table 5. The Effect of Comparison of Wheat Flour, Mocaf Flour and Moringa Leaf Powder on the Analysis of L* Brightness Levels in Wet Noodles

Comparison of Wheat Flour and Mocaf Flour	Addition of Moringa Leaf Flour			Mean	
	10%	15%	20%		
100% : 0%	44,445	39,700	34,355	39,503	a
90% : 10%	40,320	40,775	40,120	40,405	a
80% : 20%	45,175	39,580	42,520	42,425	a
70% : 30%	45,415	37,660	43,340	42,140	a
Mean	43,841a	39,429a	40,085a		

Note: The same letter behind the mean value in the same column indicates a difference that is not significant (p>0.05).

Based on the research results, the highest brightness value (L*) of wet noodles was in the treatment of comparison of wheat flour and mocaf flour in the treatment of comparison of 80% wheat flour and 20% mocaf flour with an average value of 42.425% while the lowest was in the treatment of 100% wheat flour and 0% mocaf flour with an average value of 39.503%. Based on Table 3.5, the highest treatment for adding Moringa leaf powder was in the treatment of adding 10% Moringa leaf powder with an average value of 43.841%, while the

lowest value was in the treatment of adding 15% Moringa leaf powder with an average value of 39.429%. The more the addition of Moringa leaf flour is, the brightness of the wet noodles decreases. Moringa leaf flour contains green substances and chlorophyll which makes the noodles green. Moringa leaf powder also contains polyphenols which cause enzymatic browning, polyphenolase reactions and oxygen in the air (Istiqomah, 2014).

(a) Value*

(a*) Value is a color parameter that indicates the level of redness or greenness of a sample, with a value range of -80 to +80. The closer to the value -80, the sample will be closer to green. While getting closer to +80, the sample will be closer to red. The average (a*) value of wet noodles can be seen in Table 6.

Table 6. The Effect of the Substitution of Mocaf Flour and Moringa Leaf Flour to the Value (a*) of Wet Noodles

Comparison of Wheat Flour and Mocaf Flour	Addition of Moringa Leaf Flour			Mean	
	10%	15%	20%		
100% : 0%	-8,240	-2,950	-8,035	-6,408	a
90% : 10%	-8,220	-6,335	-8,355	-7,637	a
80% : 20%	-8,380	-7,975	-9,525	-8,627	a
70% : 30%	-8,250	-7,735	-8,435	-8,140	a
Mean	-8,273b	-6,249a	-8,588b		

Note:

1. The same letter in the same line beside the mean value indicates a difference that is not significant (p>0.05).
2. The different letters behind the average value in the same column below the average value indicates a significant difference (p <0.05) to very significant (p <0.01).

Based on Table 6, it can be seen that the highest (a*) value for wet noodles was found in the treatment of adding 15% Moringa leaf flour with an average value of -6.249. While the lowest (a*) value was found in the treatment of adding 20% moringa leaf flour with an average value of -8.588. The more moringa flour added to the wet noodles, the more negative (a*) the value (the greener the color was). This is because the green color appears due to the presence of chlorophyll in Moringa leaves. Chlorophyll is a green pigment found in chloroplasts together with carotenes and xanthophylls (Winarno, 2004).

(b) Value*

Value (b*) is a color parameter that indicates the level of yellowness or bluishness of a sample, with a value range of -70 to +70. The closer the value to -70, the sample will be closer to blue. Meanwhile, the closer the value to +70 the

sample will be yellowish. The average value (b*) of wet noodles can be seen in Table 7.

Table 7. The Effect of the Substitution of Mocaf Flour and Moringa Leaf Flour to Value (B*) on Wet Noodles

Comparison of Wheat Flour and Mocaf Flour	Addition of Moringa Leaf Flour			Mean	
	10%	15%	20%		
100% : 0%	18,095	10,715	10,760	13,190	a
90% : 10%	14,715	9,200	13,885	12,600	a
80% : 20%	14,410	10,780	18,380	14,523	a
70% : 30%	13,665	9,685	16,040	13,130	a
Mean	15,221 a	10,095 b	14,766 ab		

Note:

1. The same letter in the same line beside the mean value indicates a difference that is not significant ($p>0.05$).
2. The different letters behind the average value in the same column below the average value indicates a significant difference ($p <0.05$) to very significant ($p <0.01$).

Based on Table 7 it can be seen that the highest (b*) value was found in the treatment of adding 10% Moringa leaf powder with an average value of 15.221. On the other hand, the lowest value was found in the treatment of adding 15% moringa leaf powder with a value of 10.095. The yellow color in the treatment was due to the presence of mocaf flour, so the more mocaf flour is used, the higher the yellow value in the wet noodles is.

Subjective Variables

The average value of the panelists' preference on color, aroma, texture, taste and overall acceptance of the wet noodles resulting from the substitution treatment of mocaf flour with the addition of Moringa leaf flour can be seen in Table 8 and Figure 1.

Table 8. Average Subjective Value of Wet Noodles Comparison of Wheat Flour, Mocaf Flour and Moringa Leaf Flour

Wheat Flour Comparison, Mocaf Flour and Moringa Leaf Flour	Color	Aroma	Texture	Taste	Overall Acceptance
100% : 0% : 10%	5,27 a	5,47 a	5,40 a	5,53 a	5,47 a
100% : 0% : 15%	5,07 a	4,87 a	5,13 a	5,27 a	5,00 a
100% : 0% : 20%	4,80 a	4,93 a	5,00 a	4,40 a	4,67 a
90% : 10% : 10%	5,07 a	4,20 a	5,13 a	5,07 a	4,73 a
90% : 10% : 15%	4,87 a	4,60 a	4,73 a	4,93 a	5,00 a
90% : 10% : 20%	5,13 a	4,73 a	4,67 a	4,80 a	4,67 a
80% : 20% : 10%	5,87 a	5,00 a	4,40 a	4,60 a	5,13 a
80% : 20% : 15%	5,00 a	4,53 a	4,60 a	5,20 a	4,67 a
80% : 20% : 20%	4,33 a	4,60 a	4,60 a	4,93 a	4,80 a
70% : 30% : 10%	5,27 a	5,00 a	4,67 a	5,07 a	5,20 a
70% : 30% : 15%	4,93 a	5,13 a	4,73 a	4,73 a	4,93 a
70% : 30% : 20%	4,80 a	4,60 a	5,13 a	4,33 a	4,87 a

Note: The same letter behind the mean value in the same column indicates a difference that is not significant ($p>0.05$).

Figure 1. Noodle Mocaf Moringa

Color

The color of the wet noodles is affected by the addition of Moringa leaf flour where the more you add the Moringa leaf flour, the darker the color of the wet noodles will be. Table 8 shows that the addition of moringa leaf flour had no significant effect ($p>0.05$) on the wet noodle hedonic test.

Panelists always like the treatment with a ratio of 80% wheat flour, 20% mocaf flour and the addition of 10% moringa leaf flour because the noodles are attractive because of their light green color. Meanwhile, the treatment of 80% wheat flour, 20% mocaf flour and the addition of 20% Moringa leaf flour was the panelist's least favorite treatment because of the addition of a lot of Moringa leaf powder so that the color became dark or dark green.

Aroma

The aroma of wet noodles was influenced by the addition of Moringa leaf flour which was added to wet noodles in a ratio of wheat flour, mocaf flour and Moringa leaf flour. Table 8 shows that the ratio of wet noodles to wheat flour, mocaf flour and Moringa leaf flour had no significant effect ($p>0.05$) on the hedonic aroma test produced. The hedonic sensory test for wet noodle aroma compared to wheat flour, mocaf flour and Moringa leaf flour was lowest in the treatment with a ratio of 90% wheat flour, 10% mocaf flour and 10% Moringa leaf flour. While the highest value was found in the comparison of 100% wheat flour 0% mocaf flour and 10% moringa leaf flour.

Based on Table 3.8, it can be seen that the more hedonic sensory moringa flour added, the less smell of wet noodles is. The smell of wet noodles is influenced by the unpleasant smell of Moringa flour. The unpleasant odor in Moringa leaf flour is due to the fact that Moringa leaves contain lipoxidase enzymes, namely enzymes found in green vegetables because lipoxidase enzymes hydrolyze or decompose fat into compounds that cause unpleasant odors, which belong to the hexane 7 and hexanol groups as stated by Ilona and Rita (2015).

Texture

In Table 3.8 it can be seen that the effect of the comparison of wheat flour, mocaf flour and Moringa leaf flour on the wet noodles produced had no significant effect ($p>0.05$) on the hedonic texture sensory test produced. In making wet noodles with substitution of mocaf flour and moringa leaf flour, the amount of solids including wheat flour and mocaf flour was used in the same proportion in all samples, so that when these ingredients were mixed with moringa leaf flour and water it became a homogeneous dough, it will produce noodles which was a bit chewy. The chewy texture of wet noodles is produced from the wheat flour used, which is high protein flour which has high gluten (Trisnawati and Nisa, 2015).

Taste

Taste is one of the factors that determines the level of a people's preference for a food. Panelist acceptance of taste is influenced by many factors, including chemical compounds, temperature, concentration and interactions between flavor components contained in a food ingredient (Winarno, 2002). The average preference value for the taste of wet noodles ranges from 4.33 to 5.53, that is, I really like it to really dislike it. The treatment ratio of 70% wheat flour, 30% mocaf flour and 20% moringa leaf flour, was always disliked by the panelists. This is because the more Moringa leaf flour is added, the bitter taste tends to increase which is caused by the Moringa leaf itself. According to Rosyidah (2016) what causes bitterness in Moringa leaves is tannin compounds. Tannins can cause an astringent taste because when consumed they form cross-links between tannins and proteins or glycoproteins in the oral cavity, causing a dry and wrinkled feeling or astringent taste.

Overall Acceptance

Table 3.8 shows that the effect of the comparison treatment of wheat flour, mocaf flour and Moringa leaf flour had no significant effect ($p>0.05$) on the overall acceptance of wet noodles. The average preference value for the overall acceptance of wet noodles ranged from 4.67-5.20, that is, from acceptable to like. From Table 4.6 it can be seen that the highest level of preference of the panelists was obtained from the treatment ratio of 70% wheat flour, 30% mocaf flour and 10% Moringa leaf flour. The treatment of the ratio of wheat flour, mocaf flour and moringa leaf flour to wet noodles had no significant effect on the overall acceptance of wet noodles and was acceptable to the panelists.

CONCLUSIONS AND RECOMMENDATIONS

The characteristics of the best wet noodles that can be accepted by consumers are the one with ratio of 70% wheat flour, 30% mocaf flour and 10% moringa leaf flour. The results of observations on wet noodles substituted for mocaf flour and moringa leaf flour, are a water content of 71.467%, protein content of 13.249% (according to SNI 01 298797 – 2015) ash content of 1.359% (does not meet the SNI but is still accepted by consumers) swelling index 32.723 %, color L 39.580%, color a -8.380% and color b 14.410%.

To produce good wet noodles objectively and subjectively, you can use a treatment formulation with a ratio of 70% wheat flour and 30% mocaf flour and the addition of 10% moringa leaf flour.

ADVANCED RESEARCH

It is necessary to carry out further research on the characteristics of mocaf flour substitute wet noodles using flour other than Moringa leaf flour and look for carbohydrate content results. In this study, the storability of wet noodles with mocaf flour and moringa leaf flour substitution had not been investigated. It is recommended for further research to examine the shelf life. In future research it is recommended to look for antioxidant activity.

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