

Peningkatan Kualitas Mie Basah Dengan Penambahan Tepung Talas Pratama (*Colocasia Esculeta L. Schott Var. Pratama*) dan Tepung Rumput Laut (*Eucheuma Cottonii*)

Quality Improvement of Wet Noodle With The Addition of Pratama Taro Flour (*Colocasia Esculeta L. Schott Var. Pratama*) and Seaweed Flour (*Eucheuma Cottonii*)

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ABSTRACT

The purpose of this study was to determine the effect of taro flour and seaweed flour on the quality of the wet noodles produced. Wet noodle research was carried out in two stages, namely preliminary research and main research. Preliminary research includes analysis of oxalate content of taro tubers and taro flour, as well as analysis of raw materials including analysis of water content, analysis of carbohydrates and protein content. Then the main research was carried out, namely to determine the effect of the comparison of pratama taro flour and seaweed flour on wet noodles where chemical and organoleptic analyzes were carried out. Chemical testing includes analysis of water content, analysis of carbohydrates and analysis of protein. Testing the organoleptic response in the form of aroma, taste, color and texture. The method used was a randomized block design (RBD) which consisted of 1 factor, namely the T factor (comparison of taro pratama flour and seaweed) which consisted of 5 levels, namely t1 (3:1), t2 (2:1), t3 (1 :1), t4 (1:2) and t5 (1:3).The results of the comparative study of the addition of pratama taro flour and seaweed flour had an effect on water content, carbohydrate content, protein content, aroma, color and texture, but had no effect on taste.

Keywords: Taro Tubers, Seaweed, Wet Noodles, Randomized Block Design (RBD)

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INTRODUCTION

Noodles are a very common food and can be consumed by the lower middle class to the upper class. Noodles are one of the most popular types of food in Asia, especially East Asia and Southeast Asia, including Indonesia. Noodles are classified as pasta products, which are food products by mixing wheat flour and water and various additional ingredients such as salt, eggs and other additives. In general, noodles can be classified into two, namely dry noodles and wet noodles (Akbar, 2018).



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According to the World Instant Noodle Association (WINA) Indonesia in 2022 will rank second as the country that consumes the most instant noodles in the world. The total consumption of noodles will reach 13.270 billion servings in 2021. According to a 2021 survey from the Central Statistics Agency (BPS), it shows that the Indonesian population consumes 3.96 packs of instant noodles per month, with an average weight per pack of 80 grams. This number increased by 9.09% compared to the previous year with a total consumption of 3.63 packs per month.

The food industry in Indonesia makes noodle products using imported flour as raw material. Very high dependence on wheat flour commodities can threaten food security in Indonesia. Based on data from the Central Statistics Agency (BPS), throughout 2021 Indonesia's wheat flour imports will reach 31.34 million tonnes with a total value of US\$11.81 million. During January-March 2022, wheat imports were recorded to have reached 2.81 million tonnes, up 4.7% from 2021 (BPS, 2022).

One solution to reduce the prolonged use of wheat flour is to use local food ingredients. Local food ingredients that have the potential to be developed to replace carbohydrate-producing wheat are taro tubers.

Taro contains amylose content of 16.5% and amylopectin content of 83.49%, the gelatinization temperature is around 69 OC - 72 OC. The ratio of amylose and amylopectin affects the solubility properties and degree of starch gelatinization (Astarini, 2013). Amylopectin is a component that plays an important role in the gelatinization process. High levels of amylose can reduce the ability of starch to experience gelatinization. In general, starch contains more amylopectin than amylose (Aryanti, et al., 2017).

Types of seaweed that are usually processed into food that can be consumed are *Eucheuma* sp and *Gellidium* sp. Apart from its iodine content, the main composition of seaweed is carbohydrates, most of which consist of polysaccharide polymers in the form of fibers (Lubis, et al., 2013).

There are two types of wet noodles that are known to the public, namely raw wet noodles and cooked/boiled wet noodles (cooked noodles). Raw wet noodles are noodles that are cut from dough sheets without further processing. The water content of these noodles is around 35% and is usually sprinkled with tapioca to keep the noodles from sticking. The process of making cooked wet noodles includes a cooking stage (boiling/steaming) and the addition of palm oil so that the water content increases by 52%, while raw wet noodles do not go through these stages so the water content is around 35% (Panjaitan, et al., 2017).

Research on wet noodles from taro flour substitution used 30g, 50g and 70g and red spinach puree of 35g. The results showed that the substitution of taro flour and the addition of red spinach puree had a significant effect on color, aroma, shape, taste, elasticity and preference. Wet noodles with the best results were obtained with 30g of taro flour and the addition of 35g of red spinach puree (Andrianto, et al., 2021).

Research on wet noodles from a comparison of taro flour and starch with a ratio of 75:25 with or without the addition of beet extract showed that the beet extract used was B1 = 0.4 g, B2 = 0.60 g, B3=0.80 g, B4= 1 g and B5= 1.20 g. The results obtained with the addition of beetroot extract were higher, the brightness of the noodles also increased, but reduced the elasticity and pressure test. It was found that the most preferred noodle hedonic test was B4 with the addition of 1 g of beetroot extract. The addition of beetroot extract in the sensory test did not significantly affect the overall noodle attributes (Herawati, 2016).

Ahmadi's research (2022) regarding organic wet noodles made from local taro with the best formulation is 50% taro flour and 50% wheat flour substitution compared to using 30% taro flour and 70% wheat flour substitution and also 70% taro flour and 30% wheat flour substitution. The homogeneous combination and the right technique made the panelists like the three formulas, this can be proven by the high scores given to all the tested formulas.

Research on the effect of brown seaweed extract on the quality of noodles using a single randomized design method. The effect of adding seaweed of 0%, 5%, 15%, 20% and 25% on color, texture, aroma and taste found that the most preferred was noodles with the addition of 25% brown seaweed (Holinesti, et al., 2018).

Research on the effect of moringa leaf and seaweed fortification on noodle quality at concentrations of corn flour: mocaf: moringa leaf powder: *E. spinosum* seaweed flour, namely P1 (65%: 20%: 0%: 15%); P2 (65%: 20% : 3%: 12%); P3 (65%: 20% : 6%: 9%); P4 (65%: 20% : 9%: 6%); P5 (65%: 20% : 12%: 3%); P6 (65%: 20% : 15%: 0%). The results showed that the concentration of the addition of moringa leaf powder and seaweed powder had a significantly different effect on water content, fat content, protein content, iodine content, calcium content, crude fiber content. Treatment P2 is the best treatment for noodles with a water content of 7.04%; fat content 1.04%; protein content 9.2%; iodine content 5.58%; calcium content 0.15%; and crude fiber content of 9.71%. Making noodles by utilizing local food potential needs to be continuously improved, so as to reduce dependence on imports (Saloko, et al., 2020).

RESEARCH METHODS

The materials used were taro pratama, *Echeuma cottonii* seaweed flour, water, chicken eggs, iodized salt, oil, distilled water, HCl, HCl 9,5, HCl 6M, NaOH, NaOH 40%, concentrated H₂SO₄, luff school, sulfuric acid, KI, Na-thiosulphate, starch solution, selenium, 2% H₃BO₃, 0.1% bromeserol green, methyl red and 0.05M KMnO₄.

The tools used are knives, cutting boards, chip cutters, tongs, plastic gloves, noodle printers, basins, digital scales, baking sheets, spoons, bowls, pans, filters, trays, ovens, flour milling tools, glasses. chemistry, steam dish, analytical balance, oven, spatula, weighing bottle, 100 ml measuring cup, funnel, burette, distillation set, volumetric flask, 100 volume pipette, test tube, tongs, desiccator, dropping pipette, incubation, kjehdal flask, Erlenmeyer, and a ruler.

Experimental design. The experimental design used in this study was a randomized block design (RBD) with 1 factor and 5 levels with 5 repetitions to obtain 25 repetitions (Gasperz, 1995).

Raw Material Preparation. Production of Taro Flour :

1. **Trimming.** The taro is separated from the outer skin and stem using a knife so that you get the tiles. The trimming process functions to separate the unused parts of taro such as the skin and stems from the tubers to be used
2. **Whasing I.** The taro is washed to remove adhering dirt such as soil or skin from the trimming results. The taro is put in a basin or container with holes and then poured with clean running water so that the dirt that sticks to it falls down with the flowing water.
3. **Inchision.** The taro is sliced (cut into small pieces) with a thickness of ± 2 mm using a slicer. Taro slicing aims to reduce the size and make it easier for the drying process. This process also functions so that the calcium oxalate content contained in the taro will come out during the soaking process.
4. **Immersion.** Taro is soaked in water where taro:water is 1:2 and 8% salt is dissolved in it. This process is carried out for 1 hour in the basin. Soaking aims to remove oxalic acid contained in taro and also calcium oxalate (Wardani, 2019).
5. **Whasing II.** The taro is washed again with clean running water. Washing II is done to remove dirt or salt that sticks from the soaking process. The taro to be washed is put into a perforated basin so that the water will immediately flow and carry away the remaining soaking dirt that sticks. After that, the taro is drained for a while until it is slightly dry.
6. **Drying.** Taro was dried for 12 hours at 60 OC using a cabinet dryer. Drying functions to remove the water content so that when the taro starch is refined into flour according to SNI. During the drying process taro should be turned back and forth so that it dries evenly. Drying is carried out until the water content is approximately 12% and the result of drying is taro chips. (Rostianti, 2018).
7. **Milling.** Taro is ground using a flour mill to reduce the size for 20 minutes. Grinding aims to smooth taro chips that have been dried before.

8. **Sieving.** The refined taro was then sieved using 80 mesh with a vibratory screen machine. Sieving aims to uniform the size of the resulting flour.
9. **Observation.** The resulting taro flour was then analyzed for oxalate content, water content analysis, carbohydrate analysis and protein analysis. Taro flour which still has a high oxalate content will then be re-soaked using salt or acid (Wardani, 2019).

Product Manufacturing. Making Wet Noodles :

1. **Wighing.** The materials that have been prepared are weighed according to the required formulation.
2. **Mixing.** The first stage is mixing taro pratama flour and seaweed flour, after which other additional ingredients such as salt, oil, eggs and water are added. The ingredients are stirred until evenly mixed or homogeneous.
3. **Noodle printing.** The mixed dough is formed into sheets using a noodle maker with a diameter of 2 mm. The purpose of this printing is to make the dough in the form of long sheets of noodles (Akbar, 2018).
4. **Boiling.** The noodles that have been printed are then followed by the boiling process with a temperature of 90 OC within 30 seconds until the noodles appear to float slightly to the surface (Akbar, 2018).
5. **Cooling and draining.** Noodles that have gone through the boiling process are put into cold water so that the noodle dough immediately hardens and does not stick to one another. The hardened dough is immediately drained to remove water from the remaining cooling results.
6. **Organoleptic test.** The noodles were quite dry or the water had dropped and then a preference test was carried out on 30 panelists. The parameters used in the hedonic preference test are aroma, taste, color and texture.
7. **Chemical analysis.** The chemical analysis that will be carried out is the analysis of water content by the gravimetric method, the analysis of starch content by the luff school method and the analysis of protein content by the kjeldal method.

RESULT AND DISCUSSION

Preliminary research, namely the analysis of raw materials that will be used for the main research. Data from the analysis of raw materials for preliminary research are as follows:

1. **Analysis Of Oxalate Levels.** The results of the analysis of oxalate content contained in taro flour is 47.52 mg/100 g. The maximum limit for oxalate content that may be consumed or contained in food is 70 mg/100 g (Hasnelly, et al., 2020). The oxalate content in the taro tubers, which was originally around 90.72 mg/100 g, then decreased after the soaking process in water with added salt. Salt is able to make calcium oxalate compounds in cells pushed out, due to the continuous process of osmosis. Meanwhile, oxalic acid will dissolve in water (Amalia and Yuliana, 2013). The salt solution will ionize into Na⁺ and Cl⁻, and react to form sodium oxalate and precipitate calcium chloride which dissolves in water (Chotimah and Fajrina, 2013). The resulting reaction:
$$\text{NaCl} + \text{CaC}_2\text{O}_4 \rightarrow \text{Na}_2\text{C}_2\text{O}_4 + \text{CaCl}_2$$
2. **Water Content Analysis.** The results of the analysis of the water content of the raw material for taro flour which will be used for making wet noodles is 9.950%, while the water content contained in seaweed flour is 12.121%. The water content of flour that is good for use in making wet noodles is in accordance with the journal, which does not exceed 12-14% and the moisture content of flour according to good SNI does not exceed 14.5%. Moisture content is one of the parameters that greatly affect the shelf life of flour. This means that the lower the water content in the flour, the longer the shelf life of the flour.

3. **Starch Content Analysis.** The results of the starch analysis contained in taro flour were 59.32% and seaweed flour were 26.438%. The starch content contained in taro pratama flour and grass flour is quite high but the taro starch content is higher. The composition of taro starch can be influenced by climate, soil fertility, harvest age and so on (Richana, et al., 2012).
4. **Protein Content Analysis.** The results of the analysis of the protein content contained in taro flour were 5.855% and the protein content in seaweed flour was 8.026%. The protein content in taro pratama flour and seaweed flour is high but the yield of taro pratama flour is smaller than the high value of seaweed flour.
5. The results of the preliminary analysis that has been carried out, for the feasibility of taro flour and seaweed flour in terms of oxalate content (Hasnelly, et al., 2020), water content, carbohydrate content and protein content have met the eligibility (SNI 3751: 2018) so that they can be used for the manufacture of wet noodle.

Main Research. Primary research is the process of making the main product which will then become the main result. In this main research, it begins with the process of making wet noodles from the raw materials of taro pratama flour and seaweed flour which have gone through the process of mixing, kneading and molding then produce wet noodles. The response design that will be carried out in the main research is the chemical response (moisture content analysis, starch content analysis and protein analysis) and organoleptic responses (color, aroma, taste and texture).

Chemical Test. Water Content Analysis, Moisture content is the percentage of water content of a material which can be expressed based on wet weight (wet basis) or dry weight (dry basis). The effect of water content is very important in the formation of the durability of food ingredients, because water can affect physical properties or chemical changes (Buckle (1987) in Romadhona and Ekawandani (2020)).

Table 1. Comparison Effect of Pratama Taro Flour and Seaweed Flour on Moisture Content (%) of Wet Noodles

Taro Pratama Flour: Seaweed Flour (T)	Average Water Content (%)
t1 (3:1)	71,17
t2 (2:1)	73,70
t3 (1:1)	77,58
t4 (1:2)	78,94
t5 (1:3)	80,94

Table 1 can be concluded that the increasing use of seaweed flour or the decreasing pratama taro flour, the water content is increasing. The increase in the water content of wet noodles is influenced by the protein content contained in the noodles. Flour with a high protein content has a greater water absorption capacity than flour with a lower protein content (Billina, et al., 2014).

The water content is also affected by the crude fiber in dissolved seaweed where the crude fiber content of seaweed is 28.11%. Soluble crude fiber can bind water, so that during the cooking process the seaweed undergoes a gel formation process which will form a film layer so that water molecules are trapped. The water contained in the film cannot come out so the water content increases with the addition of seaweed (Suhaimi, 2019).

According to Santoso et al (2013) carrageenan is easy to absorb water because of the presence of negatively charged sulfate groups along the polymer chain. The sulfate ester groups and galactopiranos units contained in carrageenan are hydrocolloid, so the higher the use of carrageenan, the amount of free water in it increases and the gel structure gets stronger. Carrageenan as a hydrocolloid has the ability to bind

large amounts of water. Carrageenan has OH- free ions which are able to bind with H₂O (water) so that they become bonds (Wijana, et al., 2014).

Starch Content Analysis. Starch is a polysaccharide compound consisting of monosaccharides linked by oxygen bonds. The monomer of starch is glucose which is linked by α (1,4)- glycosidic bonds, which are chemical bonds that combine 2 monosaccharide molecules that are covalently bonded to each other. Starch is a carbohydrate starch substance with a polymer of glucose compounds consisting of two main components, namely amylose and amylopectin. The linear polymer of D-glucose forms amylose with (α)-1,4-glucose bonds. Meanwhile, amylopectin is formed from (α)-1,4-glucoside bonds and forms branches on (α)-1,6-glucoside bonds for biodegradable plastics (Akbar, 2013).

Table 2. Effect of Comparison of Taro Pratama Flour and Seaweed Flour on Starch Content (%) of Wet Noodles

Taro Pratama Flour: Seaweed Flour (T)	Average Starch Content (%)
t1 (3:1)	40,49
t2 (2:1)	37,30
t3 (1:1)	36,00
t4 (1:2)	33,65
t5 (1:3)	29,82

Table 2 can be concluded that the decrease in the use of pratama taro flour or the increase in seaweed flour, the starch content decreases. This is because the starch content in seaweed flour is lower than taro pratama flour.

Carbohydrates are the most important content in each tuber as well as those found in taro tubers, one of which is starch. Taro tuber is a fairly large source of carbohydrates because most of the content of taro tuber is starch. Taro tubers contain food reserves in the form of carbohydrates as a result of photosynthesis, the amount of carbohydrates in taro tubers is affected by the nutrients absorbed and the activity of the plant (Titin, et al., 2018).

Protein Content Analysis. Protein is a food substance that is important for the body, because this substance besides functioning as fuel in the body also functions as a builder and regulatory substance. Protein is a group of macronutrients. Unlike other macronutrients (fats and carbohydrates), this protein plays a more important role as a building block for biomolecules than as a source of energy. Protein is an organic compound with a very large number of molecules, the structure is very complex and is composed of a series of amino acids. The main bonds between amino acids with one another occur due to peptide bonds, so proteins are often called polypeptides (Taufik, et al., 2021).

Table 3. Effect of Comparison of Taro Pratama Flour and Seaweed Flour on Protein Content (%) of Wet Noodles

Taro Pratama Flour: Seaweed Flour (T)	Average Protein Content (%)
t1 (3:1)	6,22
t2 (2:1)	6,49
t3 (1:1)	7,00
t4 (1:2)	7,05
t5 (1:3)	7,08

Table 3 can be concluded that the decreasing pratama taro flour or increasing seaweed flour, the protein content is increasing. This is because the protein content in seaweed flour is greater than taro pratama

flour. The highest protein content was in the t5 treatment and the protein content decreased in the t4, t3, t2 and t1 treatments.

Protein is formed from elements that are almost the same as carbohydrates and fats, namely carbon, hydrogen and oxygen elements but added with nitrogen elements. Protein molecules are composed of amino acids. The amino acids in the molecule are linked together by a bond called a peptide bond. Seaweed protein levels vary depending on the type of seaweed. The lowest protein content in brown seaweed is 5-11% of dry weight, but still comparable to the protein content in leguminous plants. Red seaweed contains about 30-40% protein of dry weight, while green seaweed contains \pm 20% protein of dry weight (Hidayati and Saparinto, 2006).

The protein contained in the noodles is also the protein from the eggs. The main role of eggs or egg protein in processing in general is to facilitate coagulation, gel formation, emulsion and structure formation. The nutritional value of eggs is very complete, the contents of the egg consist of 35% egg yolk and 65% egg white. Egg white in other words is called albumin, where albumin contains more than 50% egg protein. Egg whites contain higher protein, while egg yolks are richer in vitamins than egg whites, especially vitamin A. Vitamins in egg yolks are generally fat soluble. One of the advantages of egg protein compared to other animal proteins is its very high digestibility (Rusdi, et al., 2016).

Organoleptic Test. According to Garnida (2020), organoleptic testing is a method used to test the quality of a material or product with the five human senses based on preferences and desires for a product. Organoleptic test is a traditional test method, in which the test method is carried out using the human senses as the main tool for measuring the acceptability of products.

Scent. Scent is something that can be detected through the sense of smell. To get a scent, the scent substances must be able to evaporate. In the food industry, aroma testing is considered important, because it can quickly provide the results of an assessment of a product about whether or not the product is acceptable (Kartika et al, 1998).

Table 4. Comparison Effect of Pratama Taro Flour and Seaweed Flour on the Scent of Wet Noodles.

Taro Pratama Flour: Seaweed Flour (T)	Scent average
t1 (3:1)	3,95
t2 (2:1)	3,53
t3 (1:1)	3,29
t4 (1:2)	3,20
t5 (1:3)	3,11

Table 4 can be concluded that the increased taro flour used, the results for scent increased, but if the seaweed flour increased, the results decreased. This was because the panelists were not used to the aroma of seaweed, so when the seaweed flour treatment was increased, the scent increased and the panelists liked it less and less. Most of the scents of food products come from the raw materials used and the spices added.

Scent is a parameter that gives the results of an assessment of whether or not a product is accepted. However, scent is difficult to measure, so it usually causes many differences of opinion in assessing the quality of aroma (Wahyuni, 2012). The smell of food determines the delicacy of food, generally the scent that can be received by the nose and brain is a mixture of the four main smells, namely fragrant, sour, rancid, and burnt (Sipahutar, et al., 2021).

Flavor. Taste is one important factor in determining the quality of a product. Determining the value of taste can be done using the sense of taste so that perceptions arise in the form of salty, sweet, sour and bitter tastes caused by ingredients dissolved in the mouth. Taste is influenced by several factors, namely chemical compounds, temperature, concentration and interaction of other flavor components. The taste of a food ingredient is usually unstable, it can change during processing and storage (Winarno, 2004).

The results of hedonic testing of taste are subjective or based on preference values, so that the samples tested will produce the same or different judgments according to the level of sensitivity or preference of the panelists. The higher the taro flour used or the lower the seaweed flour used has no effect on the taste of the wet noodles. Wet noodles with a dominant taste of taro or dominant seaweed are still foreign to the panelists so they are not much liked.

Flavor and taste are defined as stimuli evoked by the ingested material, mainly felt by the senses of taste and smell, as well as other stimuli such as touch and acceptance of the degree of heat in the mouth. Taste is a sensation that is formed from the combination of the forming materials and their composition in a food product that is captured by the sense of taste. Taste according to the quality attributes of a product is usually an important factor for consumers in choosing a product (De Man, 2010).

Texture. Texture is one of the most frequently used parameters to determine whether a product is liked or not. Texture is one of the properties of an ingredient or product that can be felt through skin touch or tasting. Some of the textural properties are the elasticity, hardness, and softness of the product (Sipahutar, et al., 2021).

Table 5. Comparison Effect of Pratama Taro Flour and Seaweed Flour on the Texture of Wet Noodles.

Taro Pratama Flour: Seaweed Flour (T)	Texture average
t1 (3:1)	3,60
t2 (2:1)	3,27
t3 (1:1)	3,29
t4 (1:2)	2,95
t5 (1:3)	3,01

Table 5 can be concluded that the more taro flour used, the better the texture of the wet noodles produced. Conversely, the increasing use of seaweed flour produces a texture that is less desirable. This is because the addition of too much seaweed can bind too many water molecules so that it becomes wetter causing the resulting texture to tend to become soft (Sipahutar, et al., 2021).

The resulting taro noodles are quite chewy but break easily and tend to be less elastic because they do not contain gluten protein which affects the texture of the resulting noodles. Gluten is a water-insoluble protein that is only found in wheat flour. Gluten has an important role in connection with the function of flour as a basic ingredient for making noodles and bread. The dough will have a chewy or elastic nature and smooth surface. Gluten is a component of wheat flour that forms these properties (Taufik, et al., 2021).

Color. Color is one of the important attributes in a product. Even though the product is considered to have high nutrition, delicious taste, and good texture, if the product has an unattractive color, it will cause the product to be less desirable (Winarno, 1991).

Table 6. Comparison Effect of Pratama Taro Flour and Seaweed Flour on the Color of Wet Noodles.

Taro Pratama Flour: Seaweed Flour (T)	Color average
t1 (3:1)	3,70
t2 (2:1)	3,91
t3 (1:1)	4,03
t4 (1:2)	3,90
t5 (1:3)	4,09

Table 6 can be concluded that the ratio of taro pratama flour and seaweed flour has an effect on the color of the wet noodles. The more taro flour used, the panelist's preference decreased, or the increased

seaweed flour, the panelist's preference increased. This is because the more seaweed flour is used, the color will be more brownish green or look clearer.

According to Nurjanah et al (2018) stated that an increase in the brightness level of seaweed during the boiling process causes a green color to appear because it contains non-starch polysaccharides and fiber. Color also affects consumer acceptance, although color does not determine the absolute level of consumer preference. Color is an element of a consumer's initial assessment of a food product that is presented. Color is also referred to as the first impression that arises after the panelists see wet noodles (Sipahutar, et al., 2021).

CONCLUSIONS AND RECOMENDATION

From the results of the research that has been done, it can be concluded as follows: Comparison of pratama taro flour and seaweed flour had an effect on water content, carbohydrate content, protein content, aroma, color and texture, but had no effect on the taste of wet noodles.

Based on the evaluation results of the research that has been done, suggestions for a better process can be given as follows:

1. It is necessary to carry out further research regarding the boiling time and the slicing process in making noodles so that the water content is lower and the texture of the noodles is better.
2. It is necessary to do research on fiber content, amylopectin content and amylose content.

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