

Organoleptic Properties and Nutrient Cookies from *Flour of Taro Kimpul, Salak Manonjaya, and Tolo Beans As An Emergency Food*

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ABSTRACT

The potential production and nutritional content of local foodstuffs in West Java are taro kimpul, Manonjaya salak, and tolo beans, which can be developed into emergency food product cookies. This study was conducted to find out the picture of organoleptic properties (color, taste, texture and aroma) and the nutritional content in cookies of *taro kimpul*, Manonjaya salak, and tolo bean flours. This type of research was an experiment using descriptive analysis techniques. The organoleptic used was hedonic test. The formulas were by comparison of taro kimpul flour, Manonjaya salak flour, and tolo bean flour respectively for formula A (35%:20%:45%), formula B (31%:22%: 47%), formula C (26%:24%:50%), formula D (22%:26%:52%) and formula E (18%:28%:54%). The panelists on the study were 30 people. Calculation of nutritional needs using the Indonesian Food Composition Table. Based on the results of organoleptic tests, in terms of preferred color is formula E, for the preferred aroma of panelists, namely formula D, for the taste and texture preferred by panelists, namely formula C. The best formula was C. The nutritional content of *cookies* produced was energy 247–248 kcal, protein 8.06–8.09%, fat 47.17–47.36%, and carbohydrates 45.16–45.35%. The energy content of emergency food produced has qualified which is 233-250 kcal per 50g.

Keywords: emergency food; *cookies*; local food; energy; organoleptic

INTRODUCTION

Indonesia is one of the disaster-prone countries. According to the National Disaster Management Agency (2019) there have been 2,190 disasters over the past 10 months. West Java province is one of the provinces that are prone to disaster. In 2019 West Java Province occupied the second position, as a province that often occurs disasters, namely as many as 430 times. Tasikmalaya Regency is one of the regencies in West Java Province that is prone to disasters¹.

One of the effects of the disaster is the onset of malnutrition problems. Malnutrition during disasters due to lack of nutritious food intake and limited availability of food at refugee sites. To overcome this, one alternative that can be done is the manufacture of emergency food for disaster victims. The purpose of making emergency food is to meet the caloric needs of disaster victims by 2,100 kcal, protein 35-45%, fat 10-15%, and carbohydrates 40-50% in one day².

In disaster conditions, ready-to-use food (RTF) is needed. One of the emergency foods that have a long shelf life is *cookies*. *Cookies* usually have a dense and crunchy texture when broken, are made from soft dough and have a high fat content³.

Research on emergency food *cookies* has been conducted by several other researchers. This study makes *soyaba cookies* products with the best treatment between Anjasmoro soybean flour and banana mas flour at a ratio of 80%: 20%. The chemical composition of *soyaba cookies* is in accordance with the quality of SNI 01-2973-1992, except for ash and carbohydrate levels. The water content of *soyaba cookies* is 3.46%, fat 13.57%, protein 38.14%, and carbohydrates 42.66%. Another study on emergency food *cookies* was made from kimpul flour and banana flour with a ratio of 20%: 40%⁴. The characteristics of *these cookies* are water content 6.25%, protein 9.15%, fat 22.43%, and carbohydrates 59.83%. Based on the results of the study, the fat and carbohydrate content exceeded the maximum limit of emergency food standards. In the study, the research formulation still added wheat flour as the main raw material. The use of wheat flour in the manufacture of *cookies* is very often used, but still rarely uses local foodstuffs to make *cookies*.

In general, cookies are made from wheat flour. Local foodstuffs that can replace wheat flour in emergency food *cookies* are taro kimpul, Manonjaya salak, and tolo beans. Taro kimpul is one type of taro that has a high

carbohydrate content. In general, the use of taro kimpul is still limited. Taro kimpul is usually processed as an additional food ingredient such as boiled, fried, made getuk, cabbageak, and chips⁶. The carbohydrate content in taro flour is greater when compared to wheat flour which is 83.57%, while the carbohydrate content in wheat flour is 77.2%⁵.

The addition of Manonjaya salak can complement the nutritional content of emergency food cookies. In 2018 the production of local salak in Tasikmalaya Regency was quite high, which was 620,812 tons. For Manonjaya salak production as much as 325,000 tons⁷. Manonjaya salak is first processed into flour as a raw material for cookies. Manonjaya salak flour has enough nutritional content baik. Carbohydrate content per 100 grams of Manonjaya salak flour is 87.51%. So that Manonjaya salak can be one of the sources of carbohydrates in the manufacture of *cookies*. Manonjaya laced flour also contains a moisture content of 7.21%, fiber 5.96%, fat 0.55%, and protein 2.24%⁸. Manonjaya salak flour has also been developed into cookies, although it has not been specifically intended as an emergency food⁹.

To increase protein levels in *cookies*, it is necessary to add foods that have high protein content in order to meet emergency food standards. One of the foodstuffs that can be used as a source of protein is tolo beans. Tolo beans or delinquent beans have great potential as a food source of vegetable protein. Protein in tolo beans by 22.78% and water content by 11.15%¹⁰.

Another similar study in the development of locally made food was the foodbar. This food bar was made from tapioca flour, Manonjaya salak flour, peanut flour, and banana flour kepok. This food bar has nutritional content that was in accordance with emergency food standards¹¹. The development of other products as emergency food alternatives needs to be made from other local raw materials. In this study made emergency food cookies from taro kimpul flour, Manonjaya salak flour, and tolo nut flour. This product is made for emergency food standards both from nutritional content and organoleptic acceptance.

METHODS

The research that has been done was an experiment with descriptive data analysis, aiming to find out the descriptive of the organoleptic properties of *cookies* from taro kimpul flour, Manonjaya salak flour, and tolo nut flour. This research was used 5 variations of the treatment. Each treatment was tested for organoleptic properties by a consumer panel of 30 panelists.

Determination of formulation was done by calculating in advance the raw materials and additives that will be used in the manufacture of *cookies* so that per 50 grams of *cookies* can meet nutritional needs in accordance with emergency food requirements. Reference formulations are used based on the best research results from previous research, namely Characteristic of Cookies Emergency Wishful Thinking Based on Taro Kimpul Flour and Banana Kepok Flour. The best result on the study was wheat flour: taro kimpul flour: banana kepok flour (40:40:20)⁶. Then, researchers made modifications to other raw materials while still meeting the standards of nutritional content as emergency food. The modifications made by researchers were to vary formulation of taro Kimpul flour, Manonjaya salak flour, and Tolo bean flour. This formulation was done without the use of wheat flour. The treatment can be seen in Table 1.

Table 1. formulation of emergency food cookies research from kimpul taro flour, Manonjaya salak, and Tolo beans

Percent of taro kimpul flour : Manonjaya salak flour : tolo bean flour	Treatment Group					
	A (35:20:45)	B (31:22:47)	C (26:24:50)	D (22:26:52)	E (18:28:54)	
No	Ingredients (grams)					
1	Kimpul taro flour	35	31	26	22	18
2	Manonjaya salak flour	20	22	24	26	28
3	Tolo bean flour	45	47	50	52	54
4	Margarine	55	55	55	55	55
5	Refined sugar	40	40	40	40	40
6	Telur	50	50	50	50	50
7	Baking powder	1	1	1	1	1

The instruments used in the study included food scales (digital) and organoleptic test forms. The data analysis technique used was descriptive analysis. The main parameters measured were organoleptic properties

and nutrient content. The data obtained was processed using a computer software. Data was presented in the frequency distribution table.

The creation of *cookies* begins by weighing all food ingredients in accordance with the formula that has been determined. Weighing materials was done using digital scales. The next stage was mixing ingredients including egg yolk, butter, refined sugar, vanilla, and *baking powder*. Then, dough stirred using a mixer for 3 minutes. Then the dough was added kimpul taro flour, Manonjaya salak flour, and tolo bean flour, stirred until mixed. After that, cookie dough was printed. Then, the cookie dough was baked in the stove oven for 1 hour.

Organoleptic tests in this study included the color, aroma, taste, and texture of cookies with 5 different formulas. The organoleptic test in this study used the *hedonic scale test* method¹². Organoleptic tests were conducted by 30 panelists in their respective residences. Before the organoleptic test process, the panelists are given an explanation in advance on how to perform organoleptic tests.

Nutrients in emergency food cookies were calculated using data base of raw material nutrient content from the Indonesian Food Composition Table and some literature of previous research results^{5,8,10}. The nutritional content of emergency food cookies was estimated based on the final product using the principle of mass equilibrium calculation¹³.

RESULTS

A. Organoleptic properties

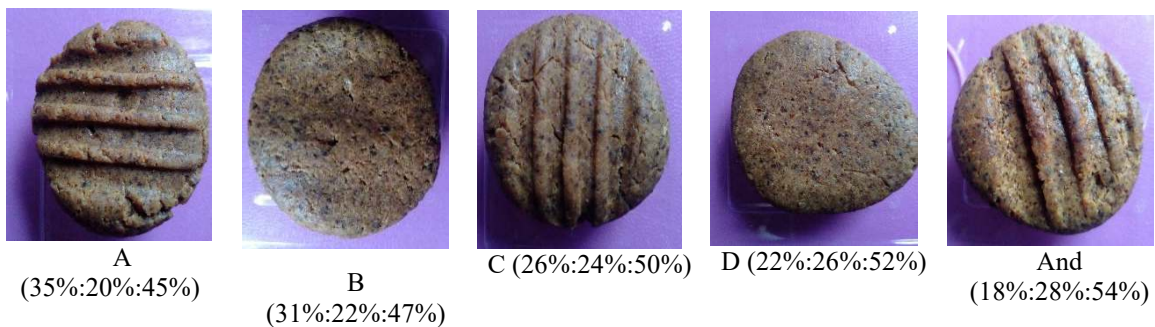


Figure 1. Emergency food cookies from kimpul taro flour, Manonjaya salak flour, and tolo bean flour

The products resulting from this study can be seen in Figure 1. In general, food cookies produced from taro kimpul flour, Manonjaya salak flour, and tolo nut flour have a brown color. The more composition of Manonjaya salak flour used, the more concentrated the brown color of cookies. Cookies for all treatments, have a distinctive aroma like biscuits in general that are processed by roasting. The more tolo nut composition used, the aroma and distinctive taste of the beans was also more pronounced. The texture of cookies on all treatments was crisp.

1. Color

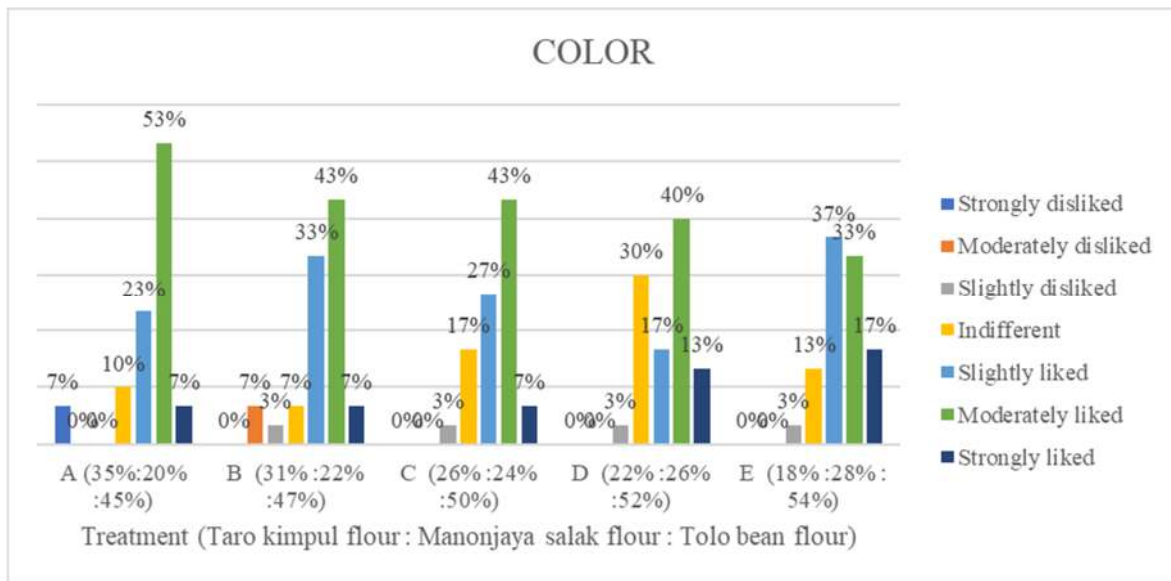


Figure 2. The level of panelist fondness for the color of emergency food cookies from taro kimpul flour, Manonjaya salak flour, and tolo nut flour

The level of panelists fondness for color in kimpul taro flour cookies, Manonjaya salak flour, and tolo bean flour can be seen in Figure 2. In Figure 2 above, 6.67% of panelists expressed their fondness for color in formula as many as 6.67% of panelists expressed great dislike, 6.67% of panelists expressed great liking, 10% of panelists expressed mediocrity, 23.33% of panelists expressed some dislike and 53.33% of panelists expressed favor.

The level of preference of panelists to color in formula B obtained the result that as many as 3.33% of panelists expressed some dislike, 6.67% of panelists expressed dislike, 6.67% of panelists expressed favor, 33.33% of panelists expressed somewhat like and 43.33% of panelists expressed favor. The level of panelists fondness for color in formula C resulted in 6.67% of panelists saying they disliked, 6.67% of panelists saying they liked it, 16.67% of panelists said they liked it, 26.67% of panelists said they liked it, and 43.33% of panelists said they liked it. The level of panelists preference for color in formula D resulted in the result that 13.33% of panelists expressed great liking, 16.67% of panelists expressed somewhat like, 30% of panelists said they liked it, and 40% of panelists expressed favor. The level of panelists' preference for color in formula E resulted that 13.33% of panelists said it was normal, 16.67% of panelists expressed great liking, 33.33% of panelists expressed favor, and 36.67% of panelists expressed somewhat like.

2. Aroma

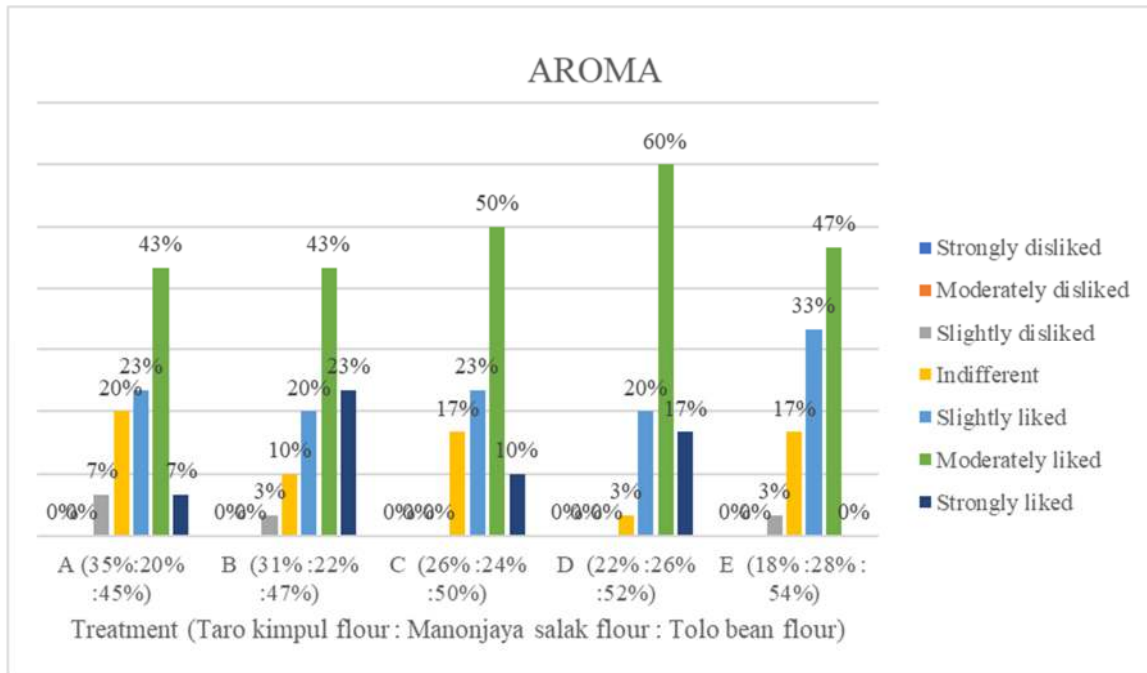


Figure 3. The level of panelist fondness for the aroma of emergency food cookies from taro kimpul flour, Manonjaya salak flour, and tolo bean flour

The level of panelists fondness for aromas in kimpul taro flour cookies, Manonjaya salak flour, and tolo bean flour can be seen in Figure 3. 6.67% of panelists expressed slight dislike, 6.67% of panelists expressed their dislike, 6.67% of panelists said they liked it, 20% of panelists said they liked it, 23.33% of panelists said they liked it, and 43.33% of panelists said they liked it.

The level of panelists fondness for aroma in formula B resulted that 3.33% of panelists expressed some dislike, 10% of panelists said they liked it, 20% of panelists said they liked it, 23.33% of panelists said they liked it, and 43.33% of panelists said they liked it. The level of panelists' fondness for aroma in formula C resulted in that as many as 10% of panelists expressed great liking, 16.67% of panelists said they liked it, 23.33% of panelists said they liked it, and 50% of panelists said they liked it. The level of panelists' fondness for aroma in formula D resulted in the result that 3.33% of panelists said it was normal, 16.67% of panelists said they liked it, 20% of panelists said they liked it, and 60% of panelists said they liked it. The level of panelists' fondness for aroma in formula E resulted that 3.33% of panelists expressed some disliking, 16.67% of panelists said they were ordinary, 33.33% of panelists expressed somewhat liking, and 46.67% of panelists expressed favor.

3. Taste

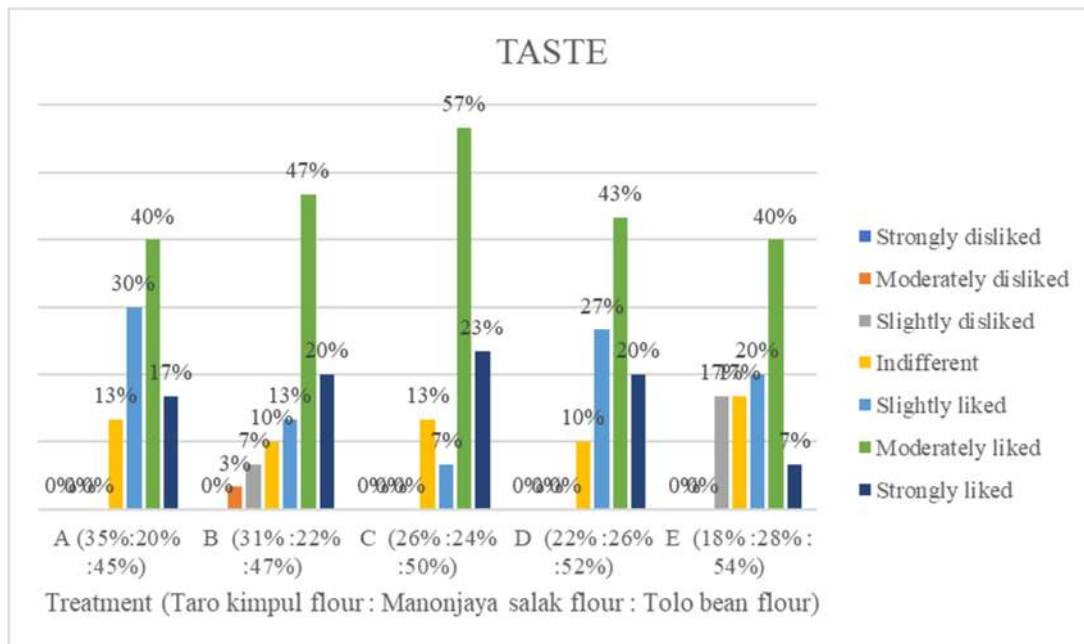


Figure 4. The level of panelist fondness for the taste of emergency food *cookies* from taro kimpul flour, Manonjaya salak flour, and tolo bean flour

The level of panelists fondness for flavor in kimpul taro flour cookies, Manonjaya salak flour, and tolo bean flour can be seen in Figure 4. The panelists fondness for flavor in formula A resulted in the result that 13.33% of panelists said they were ordinary, 16.67% of panelists said they liked it, 30% of panelists said they liked it, and 40% of panelists said they liked it. The level of panelists' fondness for taste in formula B resulted in that 3.33% of panelists expressed dislike, 6.67% of panelists expressed some dislike, 10% of panelists expressed mediocrity, 13.33% of panelists expressed some dislike, 20% of panelists expressed great dislike, and 46.67% of panelists expressed favor. The level of panelists fondness for taste in formula C resulted in 6.67% of panelists saying they liked it, 13.33% of panelists said they liked it, 23.33% of panelists said they liked it, and 56.67% of panelists said they liked it. The level of panelists fondness for taste in formula D resulted in that 10% of panelists said they liked it, 20% of panelists said they liked it, 26.67% of panelists said they liked it, and 43.33% of panelists said they liked it. The level of panelists fondness for taste in formula E resulted that 6.67% of panelists expressed great liking, 16.67% of panelists expressed some dislike, 16.67% of panelists said they were ordinary, 20% of panelists expressed somewhat like, and 40% expressed favor.

4. Texture

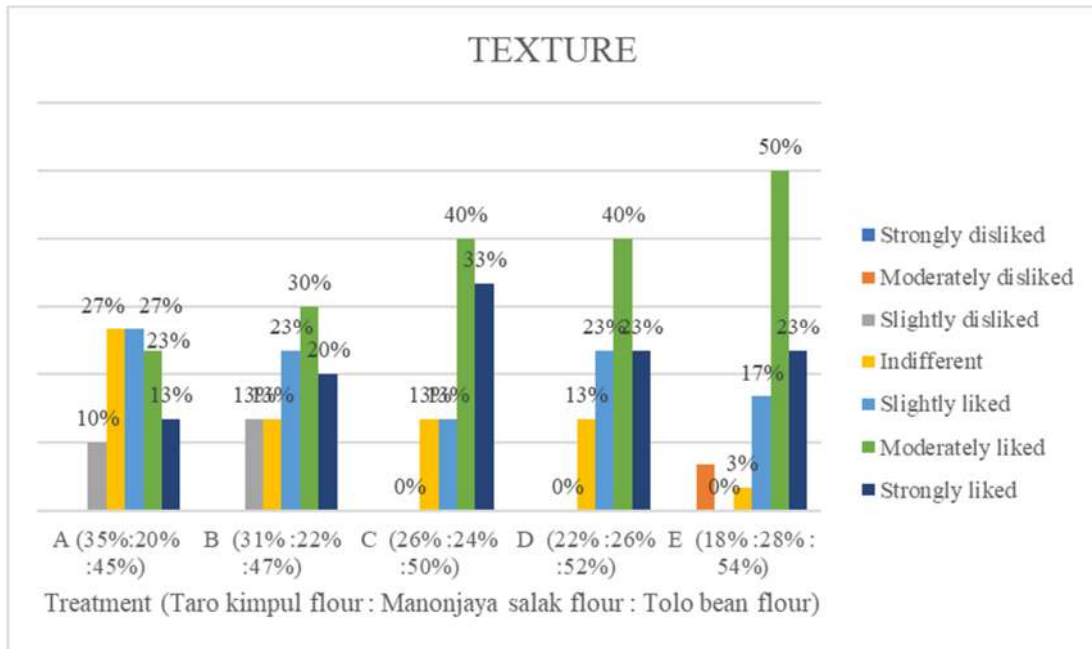


Figure 5. The level of panelist fondness for the texture of emergency food cookies from taro kimpul flour, Manonjaya salak flour, and tolo bean flour

The level of panelists fondness for texture in kimpul taro flour cookies, Manonjaya salak flour, and tolo bean flour can be seen in Figure 5. The panelists fondness for texture in formula A resulted that 10% of panelists expressed some disliking, 13.33% of panelists expressed great liking, 23.33% of panelists expressed a lot of liking, 26.67% of panelists said they were normal, and 26.67% of panelists said they liked it. The level of panelists fondness for texture in formula B resulted that 13.33% of panelists expressed some dislike, 13.33% of panelists said they were ordinary, 20% of panelists said they liked it, 23.30% of panelists said they liked it, and 30% of panelists said they liked it. The level of preference of panelists to texture in formula C obtained the result that as many as 13.33% of panelists are ordinary, 13.33% of panelists say they like it, 33.33% of panelists say they like it, and 40% of panelists say they like it. The level of preference of panelists to texture in formula D obtained the result that as much as 13.33% ordinary, 23.33% of panelists expressed somewhat like, 23.33% of panelists said they liked it very much, and 40% of panelists liked it. The level of panelists fondness for texture in formula E resulted in the result that 3.33% of panelists said they were ordinary, 6.67% of panelists said they disliked, 16.67% of panelists said they liked it, 23.33% of panelists said they liked it, and 50% of panelists said they liked it.

5. Overall of Organoleptic Properties

An overall organoleptic test assessment of color, aroma, taste, and texture was performed by calculating the average panelist's assessment for each sample of organoleptic properties. This assessment was conducted to find out which samples were better accepted by panelists of all organoleptic properties. The results of the overall assessment of organoleptic properties, can be seen in Figure 6.

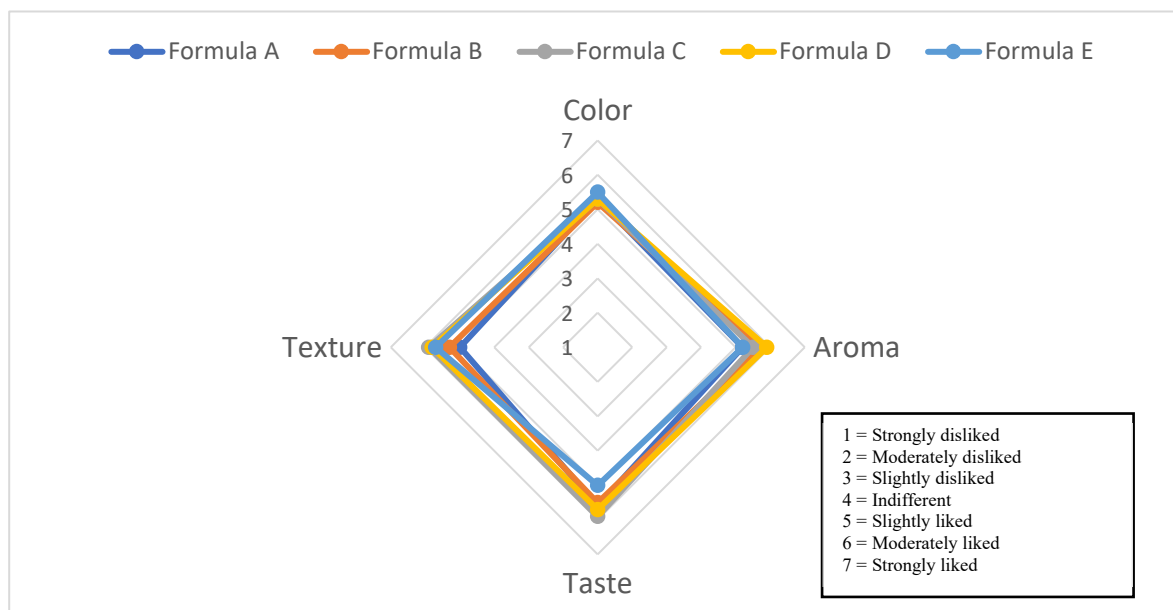


Figure 6. Panelist assessment of the overall parameters of emergency food *cookies* from taro kimpul flour, Manonjaya salak flour, and tolo bean flour

Based on Figure 6, the results of organoleptic tests conducted by 30 panelists, showed that all formulas could be well received as emergency food, looking at an average value above 5. Judging from the characteristics preferred by panelists, from the preferred color parameters are formula E. From the preferred aroma parameters of panelists, namely formula D and from the parameters of taste and texture that the panelist prefers, namely formula C. The best formula was C.

B. Nutritional Content

Determination of *the* nutritional content of cookies is done by calculating the moisture content of *cookies* first. The moisture content of *cookies* generated on each product can be seen in Table 2. The content of macronutrients (carbohydrates, fats, and proteins) is calculated assuming the water content of the final product Cookies of 5% in accordance with the Indonesian National Standard (SNI) biscuits³. After the water content of each *cookie* formula was known, the next step is to do calculations to find out the nutritional content of *cookies* in accordance with emergency food conditions. The nutritional content of *cookies* from the five formulas can be seen in Table 2.

Table 2. Percentage of macronutrient content of emergency food *cookies* from taro kimpul flour, Manonjaya salak flour, and tolo nut flour per 50 grams

Treatment (taro kimpul flour: Manonjaya salak flour: tolo bean flour)	Percentage of Nutrients			
	Protein (%)	Fat (%)	Carbohydrates (%)	Energy (2)
A (35% : 20% : 45%)	8.06	47.17	45.16	248
B (31% : 22% : 47%)	8.06	47.17	45.16	248
C (26% : 24% : 50%)	8.09	47.36	45.35	247
D (22% : 26% : 52%)	8.09	47.36	45.35	247
E (18% : 28% : 54%)	8.09	47.36	45.35	247

C emergency food *ookies* per 50 grams in all formulas A, B, C, D, and E have qualified emergency foods for energy and carbohydrate content. The fat content of all five formulas exceeds emergency food requirements. The protein content of the five formulas has not yet reached emergency food requirements. Emergency food requirements can be met with the fulfillment of *makronutrient* namely protein 10-15%, fat 35-45%, carbohydrates 40-50%, and energy 233-250 kcal².

DISCUSSION

A. Organoleptic properties

Organoleptic testing is a type of testing using the human senses to assess the safety and quality of food and drink. The method used is a *hedonic scale test* with panelists as many as 30 people¹². Organoleptic tests are performed to determine the panelist's responsiveness to food.

Based on the results of research cookies taro kimpul flour, Manonjaya salak flour, and tolo bean flour, it was obtained that each formula has different organoleptic properties. The parameters used include color, aroma, taste, and texture.

1. Color

Color is one of the attributes of organoleptic testing, relating to the sense of sight¹⁴. The color produced from taro kimpul flour cookies, Manonjaya salak flour, and tolo bean flour, on average the entire formula produces a brown color. The color cookies of each formula were on average almost the same.

From the results of organoleptic tests, the most preferred color of panelists was in formula A (35%:20%:45%) as many as 53.33% expressed liking, this was because the color of cookies in formula A was brighter than other formulas. This difference occurs because apart from the difference in the use of Manonjaya salak flour, it also occurs due to differences in the use of tolo bean flour. The more addition of Tolo bean flour, the darker the color of the cookies. In line with the results of Hallen's research, et al (2013) explained that the color obtained in bread that contains higher levels of tolo bean flour produces darker and browning colors. Embezzlement in tolo bean bread may be due to the Maillard reaction that occurs during the bread making process due to the high lysine content in tolo beans. Other studies show that the more use of salak flour, the lighter the snack bar color¹⁵. Tolo beans have a high protein content. Foodstuffs that have a high protein content eat more and more amino acids contained. Amino acids can act with sugar reduction in flour beans and fruit salak during the roasting process, so there is a maillard reaction and make the color of cookies darkened. Based on the results of the study, the color on all cookie formulas can be corrected by all panelists.

The brown color produced in the cookies from this research comes from Manonjaya salak flour. The basic color of Manonjaya salak flour was brown⁸. The color of these emergency food cookies is also similar to the color of cookies made in previous studies with the main ingredients of Manonjaya salak flour and wheat⁹. In addition, this emergency food cookie product also has a color similar to the emergency food bar which was also made from Manonjaya salak flour¹¹.

2. Aroma

Smell or aroma is one of the sensory properties that is difficult to describe because it has such a great diversity¹⁴. The aroma resulting from kimpul taro flour cookies, Manonjaya salak flour, and tolo bean flour, on average the entire formula produces the distinctive aroma of cookies in general.

From the results of organoleptic tests, the most preferred aroma of panelists was in formula D where as many as 60% of panelists say they like, the resulting aroma was the typical aroma of cookies in general and there was no aroma that stands out from taro kimpul flour, Manonjaya salak flour, or tolo nut flour. This happens due to the influence of complementary ingredients and the use of manual ovens to bake cookies. Complementary ingredients that affect the aroma are margarine and eggs. The aroma of both ingredients was more prominent. But the aroma in formula E aroma that stands out was a little burnt because during the roasting process occurs a little shake. The occurrence of shaking during the roasting process because the temperature in the manual oven was uneven and the time during the roasting process was not controlled. The process of roasting cookies using a manual oven can affect the aroma of cookies because when the air roasting process comes out through the cracks, thus reducing the resulting aroma. In line with other studies showing that the use of different ovens in the process of roasting cookies, can affect the resulting aroma¹⁶. The roasting process using the resulting electric oven aroma is stronger because the electric oven is more closed, so that the air contained in the electric oven does not come out and the heat generated is evenly distributed. While the use of a manual oven for the process of roasting the air in the oven can come out through the cracks so as to reduce the aroma of cookies produced. Aroma in a product can also be affected by the addition of eggs in the material of the manufacture of the product¹⁷.

The aroma of emergency food cookies from this study is similar to the results of other studies using the baking process. For example, cookies from Manonjaya salak flour⁹, emergency food cookies from soybeans and bananas⁴, and an emergency food bar made from Manonjaya salak flour, peanut flour, and banana Kepok flour¹¹.

3. Taste

Taste is assessed through the taste senses that are considered to hammer a food. There are five basic flavors, namely sweet, sour, bitter, salty and umami¹⁴. The resulting taste of taro kimpul flour cookies, Manonjaya salak flour, and tolo bean flour was in formula A the cookie taste was less sweet, while in formula B, formula C, formula D, and formula E it tastes a bit sour.

From the results of organoleptic tests, the most preferred aroma of panelists was in formula C where as many as 56.67% of panelists expressed liking, where the resulting taste was slightly sour, and tends to taste of tolo beans. The taste of all formula cookies on average tastes less sweet. According to another reasearch, the more use of tolo bean flour causes the sweetness in biscuits to be reduced from very real to quite real, this was because the more use of tolo bean flour causes disguised sweetness with langu flavor¹⁸. The sour taste was influenced by Manonjaya salak where basically when Manonjaya salak was still in the form of fruit it tastes sour. Acid taste found in Manonjaya salak flour is a characteristic of fresh fruit^{8,9}. In line with other studies that show that the taste in cookies is also influenced by various ingredients such as sugar and butter¹⁶. In addition, the percentage of use of taro kimpul flour also affects the taste of cookies. The lower the use of taro kimpul flour, the taste of cookies produced the sweeter.

The taste of emergency food cookies as a result of this research was as favorable as baking products made from Manonjaya salak flour. These products were cookies from Manonjaya salak flour and wheat flour as well as emergency food food bar products from Manonjaya salak flour, peanut flour, and banana kepok flour^{9,11}.

4. Texture

The texture of a product can be tested using the sense of touch, using the fingertips of the hand. Texture has three elements, namely hardness and supple (mechanical), sandy and weak (geometric), oily and watery(mouthfeel)¹⁴. The texture produced from taro kimpul flour cookies, Manonjaya salak flour, and tolo bean flour is on average all formulas produce a crunchy texture.

From the results of organoleptic tests, the most preferred texture of panelists was in formula E where as many as 50% of panelists express liking. The texture produced in the formula was crispy texture. This happens because of the percentage difference in the use of tolo beans. In line with another reaserach, the higher the addition of tolo bean flour produces crackers products with a crunchy texture¹⁹. This is due to the higher carbohydrate content of peanut flour. According to another reasearch, one of the important components in the manufacture of cookies is fat²⁰. The function of fat in the manufacture of cookies is as an emulsifier material so that it can produce a crisp texture of cookies. In addition, margarine in the manufacture of cookies can also make the texture of cookies soft and crisp. The texture of these emergency food cookies is as well-liked as other research's cookie products^{4,9}.

5. Overall of Organoleptic Propersties

An overall assessment of the five formulas showed that kimpul taro flour cookies, Manonjaya salak flour, and tolo bean flour were generally well received by all panelists on each assessment parameter i.e. color, aroma, taste, and texture. The color parameter preferred by panelists is formula E, the color in formula E is darker when compared to other formulas. For aroma parameters that are preferred by panelists, namely formula D with the typical aroma of cookies in general. As for the parameters of taste and texture that panelists like, namely formula C, with the resulting taste is a slightly sour taste from salak flour and taste of tolo beans. The best formula was C. In general, the organoleptic properties of these emergency food cookies are the same as baked products made from other Manonjaya salak flour^{9,11}.

B. Nutritional Content

Cookies are one of the products that can be used as emergency food. The nutritional content in cookies,must meet emergency food requirements. Cookies are made with 5 different formulas, weighing 50 grams/product. Calculation of nutrients is done after obtaining the water content obtained in each formula. The water content produced from each formula is 5%³.

Formula A cookies products have a nutritional content of 248 kcal, protein 8.06%, fat 47.17%, and carbohydrates 45.16%. Formula B cookies have a nutritional content of 248 kcal, protein 8.06%, fat 47.17%, and carbohydrates 45.16%. Formula C cookies have a nutritional content of 247 kcal, protein 8.09%, fat 47.36%, and carbohydrates 45.35%. Formula D cookies have a nutritional content of 247 kcal, protein 8.09%, fat 47.36%, and carbohydrates 45.35%. Formula E cookies have a nutritional content of 247 kcal, protein 8.09%, fat 47.36%, and carbohydrates 45.35%.

For cookies per 50 grams, formulas A, B, C, D, and E have qualified emergency food for energy and carbohydrate content. The fat content of all five formulas exceeds emergency food requirements. The protein

content of the five formulas has not yet reached emergency food requirements. Emergency food requirements can be met with the fulfillment of micronutrients namely protein 10-15%, fat 35-45%, carbohydrates 40-50%, and energy 233-250 kcal². Not yet achieved the need for protein occurs because the constituent ingredients of making cookies are still lacking in meeting the needs of nutrients, especially protein. For fat content that exceeds emergency food requirements occur due to the excess constituent ingredients of making cookies in the fulfillment of nutrients, especially fat sources.

To find out the accuracy of the calculation of nutrients (proteins, fats and carbohydrates) cookie products need to be done laboratory tests so that the results of calculation of nutritional content are more precise and accurate. In addition, to determine the accuracy of water content, laboratory tests need to be carried out. Further research is needed to develop this cookie product. To improve the texture on cookies it is recommended when possessing the manufacture of tolo bean flour when drying must be dry in order to use a syring with a size of 80 mesh.

Cookies of taro kimpul flour, Manonjaya salak flour, and tolo bean flour can be developed for emergency food, for researchers who will develop, for supporting ingredients of fat sources should be reduced so as not to exceed emergency food requirements. It is recommended in the process of developing cookies added the constituent ingredients of other protein sources so that protein needs can be fulfilled.

CONCLUSION

Organoleptic test results from all five formulas showed that *kimpul* taro flour cookies, Manonjaya salak flour, and tolo bean flour were generally well received by all panelists. The comparison of taro kimpul flour, Manonjaya salak flour, and tolo bean flour is for formula A (35%: 20% : 45%), formula B (31%: 22% : 47%) formula C (26%: 24% : 50%) formula D (22% : 26 %:52%) and formula E (18% : 28 % : 54%). Based on the results of organoleptic tests, the color parameter preferred by panelists is formula E, the color in formula E is darker when compared to other formulas. For aroma parameters that are preferred by panelists, namely formula D with the typical aroma of *cookies* in general. As for the parameters of taste and texture that panelists like, namely formula C, with the resulting taste is a slightly sour taste from salak flour and taste of tolo beans. Judging from the level of liking, the formula that can be developed into emergency food is formula C. The best formula was C.

For *cookies* per 50 grams obtained the result that the nutritional content of *cookies* produced is energy 247-248 kcal, protein 8.06 - 8.09 %, fat 47.17 - 47.36 % and carbohydrates 45.16-45.35%. Formulas A, B, C, D, and E have qualified emergency foods for energy and carbohydrate content.

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