

POTENTIAL OF SNAIL ROLL WITH ADDITION OF KELOR LEAF FLOUR (*Moringa oleifera*) AS PMT BALITA

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ABSTRACT

Background: The prevalence of stunting in Indonesia is still increasing, the greatest prevalence in infants. Infancy is a Golden Age for the process of growth and development. Intake imbalances such as protein and calcium that can potentially Stunting. To prevent this, the body needs foods that are high in calcium.

Objective: Analyze Calcium Content, Nutrient Content and Organoleptic Snail Roll Assessment with Addition of Moringa Leaf Powder.

Method: Experimental study using a completely randomized design that is 2 factorial research consists of 4 treatment factors and 2 repetitions.

Research Results: Based on the hedonic and hedonic quality tests there was a significant influence between Formulation F0 with formulations F1, F2, and F3. Where as based on the nutritional value test F3 is a formulation with the best nutritional content with 0.88 g / 100g fiber content and calcium levels of 5807.40 g / 100 g.

Conclusion: The snail roll formulation product F3 is the chosen product because it has the highest nutritional content with a total calories of 275.24 kcal, carbohydrates 18.47 g / 100g, protein 14.29 g / 100g, fat 15.15 g / 100g, crude fiber 0.88 g / 100g, calcium 521.10 g / 100g, moisture content 49.24 g / 100g, and ash content of 2.85 g / 100g.

Keywords: Snail Roll, *Pila ampullacea*, Moringa Leaf Flour, Calcium, Coarse Fiber, Nutritional Content, Organoleptic Assessment.

INTRODUCTION

Indonesia is a developing country that has complex problems, especially in nutrition issues. Nutritional problems are the cause of a third of deaths in children. The period when children under the age of five (toddlers) are a critical period of development and growth in the human life cycle. The period of growth and development at this age is a period that is fast and will never be repeated, because it is often called the golden age or the golden age (Rusilanti, Dahlia, & Yulianti, 2015).

The main nutritional problems found in many toddlers in Indonesia are Protein Energy Deficiency (PEM). PEM has an impact on the growth and development of infants so that it can cause stunting and have a direct impact on morbidity and mortality (Hardinsyah & Supriasa, 2017). According to the results of the Basic Health Research (RISKESDAS) the prevalence of weight-loss in 2013 was 19.6 percent, consisting of 5.7 percent malnutrition and 13.9 percent malnutrition. The cause of PEM is due to insufficient nutrition both in quantity and quality. Another factor is because of the efficiency of nutrients that are important for growth and development (Nurwijayanti, 2016). Other problems can also occur such as stunting which has a fairly high prevalence in Indonesia.

Chronic nutritional problems, especially short children or stunting, hamper children's development with negative effects that will take place in the next life (UNICEF, 2012). According to (Sari, Juffrie, Nurani, & Sitaresmi, 2016) indikaor is a

chronic malnutrition based on height according to age. Stunting or can be associated with poor nutritional status which illustrates the existence of a disruption of height growth that has been taking place for a long time (Welasasih & Wirjatmadi, 2012).

One way to overcome nutritional deficiencies that occur in toddlers needs to be supplemented by Supplementary Feeding (PMT). The provision of PMT is an effort to improve the nutritional status of children (Handyani, Mulasari, & Nurdianis, 2008). This PMT is for children aged 6-59 months.

Pila ampullacea is a type of freshwater snail and is easily found in the fields. The shape resembles a golden snail (mulberry), but has a dark green shell color to black. Animals are widely consumed in various regions of Southeast Asia and have good nutritional value, namely protein 51.8%, fat 13.61%, fiber 6.09% (Listiana, Joko, & Isworo, 2012). *Pila ampullacea* has other nutritional values such as calcium 129 mg (Obande, Omeji, & Isiguzo, 2013).

Moringa leaves have a high nutritional content of protein, β -carotene, vitamin C, minerals, especially iron and calcium, even in some literature described Moringa has a protein content of 3 times that of egg protein, 25 times iron and 3 times the amount of spinach, 12 times calcium and 2 times protein (Diantoro, Rohman, Palupi, & Budiarti, 2015). Therefore local food modification is needed to make high calcium PMT for additional toddler food.

MATERIALS AND TOOLS

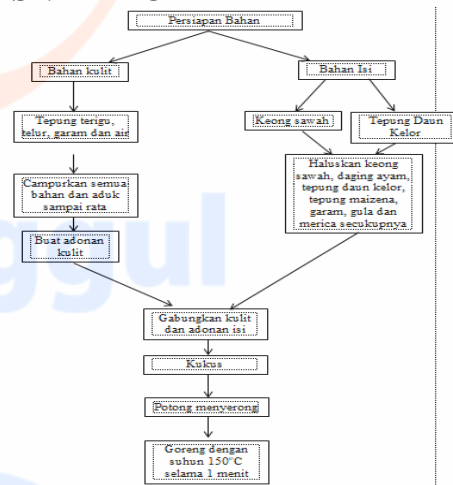
Research on snail roll made from rice snail meat with the addition of Moringa leaf flour and binder snail meat binder. This study uses experimental research design by processing these ingredients into crocodile noodles for further analysis of the acceptability and nutritional value.

Making snail roll using alat such as digital scales, containers, blenders, knives. The material to be used in snail rolli loading is based on rice field snails and chicken meat, moringa leaf flour, flour, eggs, salt and oil. Therefore, to make new innovations in the manufacture of products that have fiber and calcium content in snail roll products using local Indonesian food. Snail roll using a rice snail (*Pila ampullace*) and adding *Moringa oleifera* leaf flour as a source of calcium.

PLACE AND TIME

Organoleptic quality analysis was carried out at the Esa Unggul University Culinary Laboratory. Analysis of nutrients (water content, ash content, protein, fat, fiber, and carbohydrate content) and testing of fiber and calcium content in the Mbrio Laboratory. The main research was conducted in August 2018.

PROCEDURES FOR MAKING SNAIL ROLL



DATA COLLECTION

Data from the level of hedonic preference and hedonic quality of panelists were collected through an organoleptic test conducted by 30 semi-trained panelists from Esa Unggul University students by filling out the forms that have been provided and briefed by the Esa Unggul University Culinary Laboratory. Consumer panelists are 50 people.

Nutritional content data through analysis of nutrients with the Proximate Test, testing calcium levels and crude fiber.

PROCESSING AND ANALYSIS OF DATA

Analysis of the data used is an analysis of the organoleptic test using the Anova test (one way anova). Testing the hypothesis in one way ANOVA is done by using the F test. F test is used to prove whether or not there is a mean difference of > 2 groups. The basis for determining decision making is if:

$F_{count} > F_{table}$, then H_0 is rejected

$F_{count} < F_{table}$, then H_0 is accepted and continued with Ducan test.

RESULTS AND DISCUSSION

Panelist Passion Level On Snail Roll

The level of preference in a food product is influenced by color, texture, taste and aroma which is a component that can maintain the quality of making a snail roll. Based on differences in the level of the composition of the meat snail rice and Moringa leaf flour 75g: 0g, 70g: 5g, 65g: 10g and 60g: 15g the results of organoleptic tests were carried out to determine the level of panelist preference for snail roll obtained in table 1

Table 1 assessment of hedonic quality tests

No	formulation	Nilai rata-rata mutu hedonik			
		Color	Smell	Texture	Taste
1	F0	71.30	63.80	47.67	58.77
2	F1	49.50	49.50	37.70	44.10
3	F2	49.70	46.13	40.43	48.97
4	F3	54.97	42.50	39.40	42.23

In the color parameter, there is an F0 formulation which has the highest average value of 72.30, namely the bright color category, this is not in line with the research with (Asih, Kuswanto, & Widanti, 2018) with the lowest percentage of Moringa leaf flour with the most preferred formulation.

The most preferred smell formulation parameter is the F0 formula with a mean of 63.80. The expected aroma is not immediate. So that the F0 formulation has an indirect effect because the DKS content is quite high, 75 g without the addition of TDK. This research is in line with (Zakaria, Salmiah, & Febriani, 2011) which is the product most favored by panelists is the product with the lowest substitution of 5%.

The most preferred formulation parameter is the F0 formulation where the mean value is 58.77 without the addition of TDK. This result is in line with research (Diantoro, Rohman, Palupi, & Budiarti, 2015), namely the addition of TDK which is too much can cause a bitter taste.

The most preferred formulation parameter is the F0 formulation where the mean value is 58.77 without the addition of TDK. These results are in line with research (Diantoro, Rohman, Palupi, & Budiarti, 2015), namely the addition of TDK which is too much can cause softness.

The percentage most preferred according to the organoleptic test is F0 formulation where there is no addition of Moringa leaf flour. Panelists do not like the formulations F1, F2 and F3 because of the bitter taste of Moringa leaf flour (Asih, Kuswanto, & Widanti, 2018).

ANOVA statistical test results on the parameters of color, aroma, taste and texture show a significant difference and have a significant value that is p-value at color 0,000, aroma 0,001, taste 0,026, and texture 0,941. The data can be explained that there is an effect of adding additional Moringa leaf flour to the parameters of color, aroma, taste and texture of the snail roll product.

Nutritional Content SNAIL ROLL

Based on the results of laboratory analysis to determine the nutritional value of the snail roll which has the best nutritional content, namely in the F3 formulation with 60g rice snail

composition and addition of Moringa leaf flour 15g.

In this study the water content at F0 is the highest water content with a value of 54.52, this is due to the content of the water content in the DKS. The statement is in line with research (Listiana, Joko, & Isworo, 2012). Whereas the lowest water content is found in F2 formulation, namely with the content of DKS 65 g and the addition of TDK 10 g.

The ash content on the snail roll tends to be high in the F3 formulation which is 2.87. This can be seen in the resulting Moringa leaf biscuits, the more addition of Moringa leaf flour, the darker the resulting color, because in the formula F3 Moringa leaf content as much as 15 g more than the formulations F1 and F2 (Pangaribuan, Purwijantiningsih, & Pranata, 2013).

Carbohydrate levels in the sample are calculated by the difference method. In making snail roll with the addition of TDK with the highest carbohydrate levels in F3 Formulation with the addition of 15 g TDK by 20.3%, this is consistent with the research (Pangaribuan, Purwijantiningsih, & Pranata, 2013) which states that carbohydrate levels are higher if the addition of TDK more and more.

The highest protein content is found in the F3 Formulation which is 15.66% with the addition of TDK 15 g. Furthermore, the F2 formulation amounted to 14.29% with the addition of TDK 10 g, then the F0 Formulation was 15.09% and the lowest was the F1 formula which was 14.42%.

The highest protein content in the formula F3 where the highest TDK content is as much as 15 g. This result is in line with the research (Pangaribuan, Purwijantiningsih, & Pranata, 2013) where the addition of TDK affects the protein content.

The highest fat content in the F3 Formulation is the formulation with the highest fat content of 15.15% with the addition of TDK 15 g. Fat in this study, apart from originating from the main ingredients of the DKS and TDK, was also derived from binder, namely chicken meat and egg white, the frying process also had an effect on fat content in accordance with the research (Mas'ud & Indrawati, 2014) where the smelling process can increase fat content because during the frying process occurs heat and heat transfer will evaporate water then the material will absorb oil or fat so that the fat content of the snail roll can increase.

Coarse fiber on the snail roll with the addition of TDK shows that the F3 formulation has the highest fiber content of 0.88% with the addition of TDK 15 g. This statement with research (Pangaribuan, Purwijantiningsih, & Pranata, 2013) is that the fiber content is quite high in biscuits with the addition of Moringa leaf flour and research (Farado, Yani, & Dasir, 2017) the highest fiber content in pempek lenjer is in the treatment without using DKS due to the small DKS fiber content.

Calcium levels, F2 formulations with a calcium content of 583.65 g with the addition of 10 kg of TDK. Boiling process in rice field DKS can provide a fairly high

reduction in calcium minerals. Decrease in minerals in food can change its chemical structure during processing or due to interactions with other ingredients (Santoso, Gunji, Yoshie, & Suzuki, 2006).

CONCLUSION

Based on this researcher, there are four formulations with the addition concentration of Moringa leaf flour on snail roll products, namely 0 g, 5 g, 10 g, and 15 g. From the results of the research through the organoleptic assessment of snail roll products significantly different from the F0 formulation. Formulation with the addition of Moringa leaf flour can affect the hedonic quality of formulations F1, F2, and F3

Based on the nutritional content of the F3 formulation is a formula with the greatest nutritional content, so that the F3 formulation with the addition of 15 g of Moringa leaf flour is a selected product that tends to have the highest nutritional content. Nutrient content in F3 formulation with total calories 275.24 kcal, carbohydrates 18.47 g / 100g, protein 14.29 g / 100g, fat 15.15 g / 100g, crude fiber 0.88 g / 100g, calcium 521.10 g / 100g, moisture content 49.24 g / 100g, and ash content of 2.85 g / 100g.

The results of research on calories, carbohydrates and fat in each formulation have increased. The increase occurred because the addition of Moringa leaf flour for each different formulation and protein, ash content, fiber, and calcium tend to rise and fall. This is presumably due to the less homogeneous treatment during the

snail roll cooking process, such as the frying process.

SUGGESTION

Future research is expected to develop products with the same ingredients as attractive product appearance. Subsequent researchers can also analyze Fe and amino acid content due to high snail and Moringa leaf flour ingredients for Fe and amino acids. Further researchers are also advised to test the TPC value (Total plate count) to see the microorganisms contained in the product. In addition, further research can also save the life of snail roll products or can modify products such as rollade or modification in other forms. Snail roll can be used as ready-to-eat food or frozen food at the next research.

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