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The Effect Of Administration Of Blood Additional Tablets And Food Enriched By Sea Urchin Gonad And Moringa Leaf Flour On Increasing Body Weight And Hemoglobin Levels In Adolescent Women Of Soropia State SMA Negeri 1 Konawe District

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ABSTRACT

Background: Decreased Hemoglobin Levels or Anemia is a global public health problem in both developing and developed countries with major consequences for human health and has affected a quarter of the world's population, 2017 Anemia Convention Report, There are 202 million women in Southeast Asia and 100 million women in the West Pacific aged 15-49 years who contract anemia. World data shows that 41.8% of pregnant women and nearly 600 million preschool and school age children experience anemia, around 60% of pregnant women Research objective: To determine the effect of giving blood supplement tablets (Fe) and Baruasa enriched with sea urchin gonads and Moringa leaf flour on increasing body weight and hemoglobin levels in young women at SMA Negeri 1 Soropia, Konawe Regency. Research Method: The type of research carried out was quantitative research with a pre-experimental design with a Research and Development design regarding the Effect of Giving Blood Supplement Tablets (Fe) and Baruasa Enriched with Sea Urchin Gonads and Moringa Leaf Flour on Increased Body Weight and Hemoglobin Levels in State High School Adolescent Girls 1 Soropia Konawe Regency. Results: Baruasa hedonic test with 10% gonads with 10g moringa leaf flour (P1) was very favorable with proximate test results for nutritional content: Carbohydrates 45.53%, protein 5.46%, Fat 24.48%, Albumin 778.80, Antioxidants 244 .32, Calcium 338.93, Potassium 719.33, Vitamin A 79.25, Vitamin C 193.49, Magnesium 441.75

Keywords: Sea urchin gonads, Moringa leaf flour, increase in hemoglobin, body weight of adolescent girls, nutritional content

Introduction

2017 Anemia Convention Report, There are 202 million women in Southeast Asia and 100 million women in the West Pacific region aged 15-49 years who are infected with anemia. World data shows that 41.8% of pregnant women and nearly 600 million preschool and school age children experience anemia, around 60% of pregnant women (2). Bapenas 2012 data shows that young women aged 10-19 years are

one of the groups prone to anemia. while young women are assets for the nation's future as determinants of the next generation.

One of the causes of anemia is poor diet or low iron intake. A poor diet in small amounts inhibits the growth of teenagers, because the amount of food consumed such as rice will decrease. Eating foods that are boring and rich in additives can block the absorption of iron so that iron cannot be used in the body. Iron deficiency can also be influenced by poor nutritional status, especially those related to deficiencies of folic acid and vitamins A or B12, as occurs in developing countries.

Rich nutritional intake is also found in bagea cake, which is a typical snack that is found in almost every region of Eastern Indonesia. A cake with a dry and slightly hard texture with a sweet and savory taste, where sago flour is the basic ingredient in making the cake. The basic ingredient is made from sago flour. This cake is very unique because it has its own characteristics, apart from tasting delicious, this cake also resembles a biscuit.

Previous research shows that government efforts to overcome nutritional anemia do not always work well and effectively. In line with research showing the occurrence of anemia apart from the availability of iron tablets and the side effects caused by the tablets, other factors were found that influence the effectiveness of iron supplementation programs such as the quality of iron supplementation, how iron supplements are given. to socialize with young women, the role of parents, stakeholder cooperation, and cadre training.

Research Method

This research was carried out in phase I in 2023. At the Food Processing Technology Science Laboratory, Kendari Ministry of Health Polytechnic Campus, Nutrition Department. The type of research used was research and development, using 3 treatments with additional concentrations of sea urchin gonads (0%, 10%, 15%). The panelists in this research were students from the 2019-2020 class of Kendari Health Polytechnic, Health Polytechnic, namely 30 trained panelists.

Data collection uses a form (Questionnaire), this form is to find out the identity of the panelists from name, age, gender, cellphone number and student identification number. Meanwhile, the acceptability or organoleptic test is carried out using a hedonic scale test form to determine the level of acceptance of the existing scale (3: Like, 2: Normal, 1: Dislike) regarding the texture, color, aroma and taste of the results. Baruasa cake with sea urchin gonad concentration.

In addition, a nutritional content analysis is carried out to analyze the nutritional value contained in a product. This test was carried out after the organoleptic test, where in the test one of the most preferred products was obtained, which was then carried out with a proximate test to be able to determine and compare the nutritional value of protein, fat and carbohydrates contained in each baruasa cake.

Data processing

1) Acceptability

Receiving power data processing consists of:

a) Color data is processed based on the results obtained from organoleptic tests and then converted using SPSS with descriptive analysis and using a hedonic scale with the criteria of very like, like, dislike and very dislike.
b) Aroma data is processed based on the results obtained from organoleptic tests and then converted using SPSS with descriptive analysis and using a hedonic scale with the criteria of very like, like, dislike and very dislike.
c) Texture data is processed based on the results obtained from organoleptic tests

and then converted using SPSS with descriptive analysis and using a hedonic scale with the criteria of very like, like, dislike and very dislike.

d) Taste data is processed based on the results obtained from organoleptic tests and then converted using SPSS with descriptive analysis and using a hedonic scale with the criteria of very like, like, dislike and very dislike.

2) Proximate

a) Proximate data is processed based on the results obtained from proximate analysis and then converted using Microsoft Excel with descriptive analysis.

Data analysis

The acceptability test data that has been collected previously can then be processed through computerization with non-parametric tests. If the transformed variables are not normally distributed, then as an alternative the Kruskal Wallis test can be used. If the test results produce a p value ≤ 0.05, it can be concluded that there is at least a difference in each treatment. Meanwhile, the nutritional content data is analyzed quantitatively at the Makassar Health Laboratory Center.

Results and Discussions

1. How to Make Baruasa

a. Prepare rice flour and roast it
b. Prepare the grated coconut then roast and mash it until oily
c. Mix 1/2 kg of granulated sugar with eggs, beat until it rises.
d. Boil the remaining granulated sugar in water.
e. Pour the liquid sugar into the egg mixture and add baking soda, vanilla and coconut.
f. Add flour, stir until the dough forms a ball and put it in a baking dish that has been greased with oil and put it in the oven.
g. Grilled over medium heat

2. How to make Baruasa cake with sea urchin gonad enhancer

a) Prepare roasted rice flour
b) Prepare roasted grated coconut
c) Prepare the cooked gonads (so the fishy smell disappears)
d) Prepare Moringa leaf flour
e) Blend the gonads until smooth
f) Put the granulated sugar and eggs into a large bowl then mixer/whisk until the fine granulated sugar is evenly mixed, and add the gonads which have been weighed according to each formula and have been ground with cinnamon powder then mixer/shake until evenly mixed. , add the baking soda and stir until evenly mixed.
g) Put the roasted rice flour into a container, and the ground roasted coconut and stir until the mixture is evenly mixed.
h) Stir the mixture using a plastic spatula then stir again until evenly mixed.
i) Turn on the stove, set the temperature to 1600c then raise the oven on the stove, wait until the oven is hot.
j) Grease the container evenly using coconut oil, then roll the dough into a ball, then flatten it and arrange it on the container.
k) Put in a container containing the dough that has been shaped/molded and bake for 30 minutes.

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3. Receptivity to New Gonad Addition

a) Receptiveness to Color

The results of the color test by the panelists showed that the most preferred color acceptability was product P1. This can be seen in Figure 1, which is as follows:

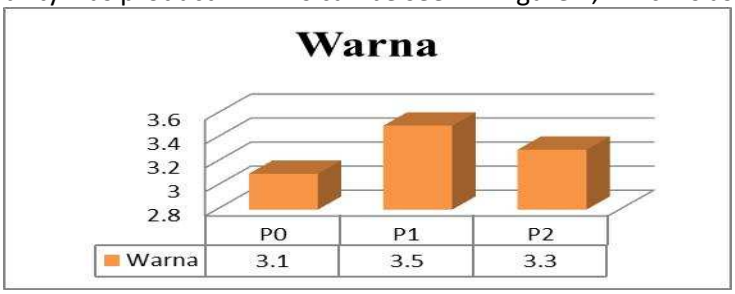


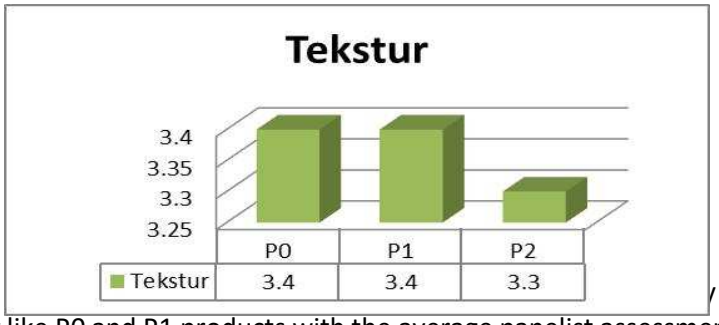
Figure 1.

Acceptability Based on Color Attributes

The graph shows that the concentration of acceptability based on color attributes, panelists really like product P1 with an average rating of 3.5

b) Acceptance of Texture

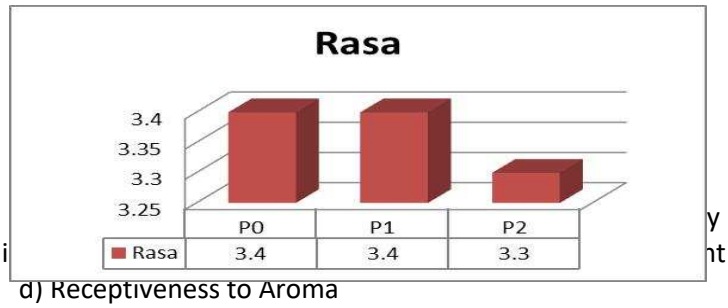
The results of the assessment of texture by the panelists showed that the acceptability of the most preferred textures were products P0 and P1. This can be seen in Figure 2, which is as follows:



y based on texture attributes, panelists really like P0 and P1 products with the average panelist assessment being 3.4

c) Receptiveness to Taste

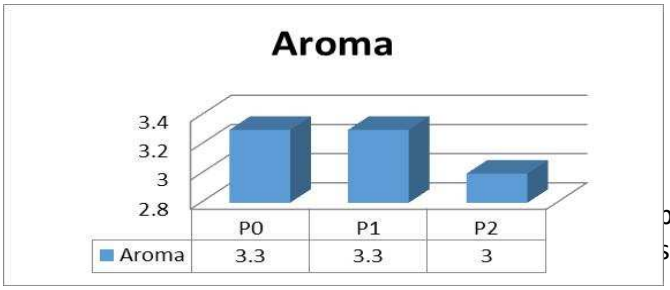
The results of the taste assessment by the panelists showed that the acceptability of the most preferred textures were products P0 and P1. This can be seen in Figure 3, which is as follows :



really li y based on taste attributes, panelists nt being 3.4

d) Receptiveness to Aroma

The results of the assessment of aroma by the panelists showed that the most preferred aroma acceptability was products P0 and P1. This can be seen in Figure 4 which is as follows :



really bility based on aroma attributes, panelists sment being 3.3

4. Likeability Level

Table 1. Distribution based on Likeability Level

Kriteria	Tingkat Kesukaan baruasa		
	P0	**P1**	**P2**
Warna	3.1	3.5	3.3
Tekstur	3.4	3.4	3.3
Rasa	3.4	3.4	3.3
Aroma	3.3	3.3	3
Jumlah	13.2	13.6	12.9
Rata – Rata	3.3	3.4	3.2

Based on the table, it shows that the average combination of attributes as a whole (Overall) is the product P1 that is most accepted and preferred by the panelists with an average of 3.4. This is because the P1 product has added balanced and appropriate ingredients so that it provides high attribute values in terms of color, texture, taste and aroma.

5. Proximate Test Results

Baruasa products are enriched with sea urchin gonads and moringa leaf flour to determine the nutritional content and are carried out by Proximad tests at the Makassar Health Laboratory Center. The proximad test results are as follows:

Table 2. Proximad test results for sea urchin gonads with Moringa leaf flour per 100 gr

o	Parameter	Satuan	Hasil pemeriksaan
.	Albumin	µg/g	778,80
.	Antioksidan	µg/g	244,32
.	Lemak	%	24,48

	Protein	%	5,46
.	Karbohidrat	%	45,53
.	Serat kasar	%	1,25
.	Kadar Air	%	1,72
.	Kadar Abu	%	1,25
.	Glukosa	%	50,59
0.	Vitamin A	µg/g	79,25
1.	Vitamin C	µg/g	193,49
2.	Besi (Fe)	µg/g	35,87
3.	Selenium (Se)	µg/g	0,10
4.	Kalsium (Ca)	µg/g	338,93
5.	Magnesium (Mg)	µg/g	441,75
6.	Kalium (K)	µg/g	719,33
7.	Natrium (Na)	µg/g	683,44

The nutritional content calculation was carried out to provide information about the nutritional content contained in baruasa so that it can be used as an additional food ingredient for young women

1. Organoleptic Test

Organoleptic tests were carried out on 40 level II nutrition students for the D3 study program and Level III D4 study program, Kendari Ministry of Health Polytechnic.

a. Color

The results of the hedonic test on the color attribute show that the panelists really like color P1 with an average of 3.5. This shows that color P1 tends to be slightly brownish according to the baruasa criteria. The more eggs you add to a product, the darker the resulting color will be.

According to Kusnandar (2010), the browner color of baruasa is caused by the Maillard reaction which involves a reaction between reducing sugars and the amine groups of free amino acids or those bound to the protein peptide structure. The results of this reaction produce a brown colored material which is often undesirable or even an indication of a decrease in quality (Martunis, 2012). In this study, the color brown was really needed according to the panelists' wishes.

b. Texture

The results of the hedonic test on the texture attribute show that the panelists really

like product P1 with an average of 3.4. This shows that the P1 baruasa texture with the addition of sea urchin gonads with moringa leaf flour has a texture that is liked by the panelists because the baruasa texture will be harder.

Winarno (2004) in Thessa Amaria Sari (2019), preparations containing eggs and flour, when heated, will cause a gelatinization process where the starch granules absorb water and swelling occurs. Next, these granules will break so that the water that enters the starch grains cannot move freely. This results in the product texture becoming dense and compact between the particles.

c. Flavor

The results of the hedonic test on the taste attribute show that the panelists really like product P1 with an average of 3.4. This shows that the taste of P1 tends to be savory with the addition of sea urchin gonads adding a delicious taste to the baruasa.

Aryani and Norhayani (2011) stated that protein is related to the components that form the taste of food ingredients, the more protein, the more delicious the product tastes. Fernando et al. (2017) in Rani (2018) stated that ingredients containing protein, when steamed, protein is hydrolyzed into amino acids, namely glutamic acid which gives a savory and delicious taste.

d. Aroma

The results of the hedonic test on the aroma attribute show that the panelists really like products P0 and P1 with a percentage of 3.3%. This shows that the aromas of P0 and P1 tend to have a typical baruasa cake aroma with the addition of gonads to the product.

The emergence of food aromas is caused by the formation of volatile compounds. The aroma emitted by each food is different. Apart from that, different cooking methods will produce different aromas. (Moehyi, 1992). When making baruasa cakes, ingredients such as gonads and moringa flour are added to produce a distinctive aroma.

e. Overall

Based on the results of the average value combining the overall attributes (Overall), the baruasa cake that was most accepted by the panelists was P1 (50 gr gonads, moringa flour, wheat flour, 2 eggs). Overall acceptance is a response that includes the results of the panelists' general assessment which includes color, aroma, texture and taste of the sample (Wasito, 2013).

2. Proximate Test

Baruasa enriched with gonads was tested for food content at the Makassar Health Laboratory Center. In the process of making Baruasa, rice flour is used as the main ingredient. Baruasa is a typical regional food from Southeast Sulawesi. Baruasa cake is a snack made from gonads, eggs, wheat flour and moringa flour.

The nutritional value characteristics analyzed were the protein, fat and carbohydrates contained in the baruasa cake which was enriched with sea urchin gonads and moringa flour.

a. Proteins

Proteins contain chains of amino acids which are very important, especially for growth functions (anabolism) and catabolic functions (among other things, movement). Protein quality depends on the completeness of the essential amino acid levels. Sea urchin gonads have high biological protein value as a source of essential amino acids including glycine, valine, alanine, methionine and glutamic acid, as well as nucleotides of the type inosine monophosphate (IMP) and guanosine monophosphate (GMP) (Roslita 2000), Test measurement results The proximate protein content of sea urchin gonads in Baruasa cakes showed that the nutritional value of protein was 5.46 grams.

b. Fat

Fat is a form of excess energy stored by animals so that the amount of fat in an animal that is used as food is determined by the animal's energy balance. Fat can also be used as a source of essential fatty acids and vitamins (vitamins A, D, E and K) (Belitz et al. 2009). The results of proximate test measurements of the sea urchin gonad fat content in the baruasa cake showed that the nutritional value of the fat was 24.48 gr.

c. Carbohydrate

Carbohydrates are compounds formed from carbon, hydrogen and oxygen molecules. As a type of nutrient, the main function of carbohydrates is to produce energy in the body. Every 1 gram of carbohydrate consumed will produce 4 kcal of energy and the energy resulting from the oxidation (burning) process of these carbohydrates will then be used by the body to carry out various functions such as breathing, heart and muscle contractions and also to carry out various physical activities such as exercising or work (Irawan, 2007) in Fera et al, (2019).

Conclusion

The results of the hedonic test for aroma, texture, taste and average color of baruasa (P1) were very favorable. From the Baruasa Proximat Test, sea urchin gonad content was 10% with 10g moringa leaf flour, it was obtained that the nutritional content of baruasa per 100g, Carbohydrates 45.53, protein 5.46%, Fat 24.48%, Albumin 778.80, Antioxidants 244 .32, Calcium 338.93, Potassium 719.33, Vitamin A 79.25, Vitamin C 193.49, Magnesium 441.75

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Conflic of Interest

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