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The Effect Of Additional Paste Of Sukari Date Fruit On Organoleptic Properties, Nutritional Value And Acceptance Of Sule Sukari Ice Cream As An Alternative Food In Elementary School Children

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Abstract: *Malnutrition in children can have a bad impact because in addition to increasing the risk of various diseases, it also tends to inhibit the growth and development of children. Various efforts to overcome the problem of malnutrition in children include providing food that contains high energy and protein, which can be obtained from Sule Sukari ice cream made from soy milk with the addition of Sukari Dates paste which is high in energy and protein. This research was conducted at the Food Science Laboratory, Department of Nutrition, Poltekkes Mataram in December 2021 using an experimental method with a completely randomized design (CRD) with one factor, namely the addition of Sukari date fruit paste consisting of 5 treatment levels (0%, 10%, 20%, 30%, 40%), 3 repetitions each. Organoleptic trait data were collected by hedonic organoleptic test and statistically processed using Analysis Of Variance (One Way Annova) at 95% confidence level (α = 0.05). Acceptability data was obtained through the acceptance test for elementary school-aged children in grades 4, 5 and 6 at SDN Bejelo, while nutrient data was obtained through a proximate test conducted at the Laboratory of Analytical Chemistry, University of Mataram. The addition of Sukari date fruit paste had a significant effect on the organoleptic properties, namely the color, taste and texture of Sule Sukari ice cream (p<0.05). Based on the organoleptic test, t3(20%) was the most preferred treatment by the panelists. The proximate test results showed that the selected Sule Sukari ice cream had a moisture content of 62.64%, ash content 0.84%, fat content 10.01%, protein content 3.70% and carbohydrates 22.81%. In the acceptance test, there were 30 people (93.7%) categorized as good acceptance and 2 people (6.3%) from 32 children. Sule Sukari ice cream was given as much as 135 g with energy content of 264.7 kcal, 5 g protein, 13.5 g fat, and 30.8 g KH.*

Keywords: Dates Sukari, Ice Cream, Soy Milk.

INTRODUCTION

Elementary school-age children experience very rapid physical, intellectual, mental and emotional growth. Foods that contain elements of nutrients are needed for the growth and development process. By consuming adequate nutrition regularly, children will grow up healthy so they can achieve high learning achievement and fitness to participate in all activities so that they become quality human resources(Wiradnyani *et al.*, 2016)

Nutritional problems in elementary school-aged children that are usually found include short, very thin, obesity or overweight and anemia.(Wiradnyani *et al.*, 2016) Basic health research data (Riskesdas, 2018) shows that the prevalence of nutritional status in children aged 5-12 years nationally is 16.9% short, 6.7% very short, 6.8% thin. very thin 2.4%, fat 10.8%, obesity 9.2%, anemia in children aged 5-14 years 26.8%. Meanwhile, the prevalence of nutritional status of children aged 5-12 years based on Riskesdas NTB 2018 is short 21.1%, very short 6.3%, thin 13.2%, very

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thin 3.0%, fat 5.4%, obese 3.9%(Riskesdas NTB, 2018).

One of the efforts to overcome nutritional problems in children is to increase energy and protein intake. Through the provision of food, such as making alternative food foods that are liked by children, namely healthy and nutritious snacks. Sule sukari ice cream is ice cream made from soy milk and dates where soy milk can serve as an alternative to cow's milk, because it has almost the same nutritional content, namely in 100 grams of soy milk it contains 44% calories, 3.6 protein. %, fat 2%, iron 1.2 mg (Utami, 2008).

Sukari dates are useful for increasing hemoglobin levels in the blood (Arini Pradita Roselyn, Ari Khusuma, 2018). In addition, there are three types of antioxidants that are the highest in dates, namely the first in the form of flavonoids which can help reduce inflammation, reduce the risk of diabetes, Alzheimer's disease and cancer. Both carotenoids are antioxidants that can improve heart health and can also reduce the risk of eye-related disorders and the third form of phenolic acid is an antioxidant known for its anti-inflammatory properties that can help reduce the risk of cancer and heart disease.(Rahmani *et al.,* 2014).

Based on the description above, research has been carried out on organoleptic properties, nutritional value and acceptability of Sule Sukari ice cream with the addition of Sukari date fruit paste as a distraction for malnourished children. Sule Sukari ice cream with the addition of Sukari date fruit paste is expected to be a good alternative food source of energy and protein and can be accepted by all age groups, especially at the age of children who are still growing.

METHODS

Experimental method with Completely Randomized Series (CRD) consisting of 5 levels of treatment with 3 repetitions each, namely:
t1 = Addition of 0% Sukari date fruit paste
t2= Addition of 10% Sukari date fruit paste
t3= Addition of 20% Sukari date fruit paste
t4= Addition of 30% Sukari date fruit paste
t5 = Addition of 40% Sukari date fruit paste

The addition of Sukari date fruit paste in making Sule Sukari ice cream can be seen in Table 1.

Table 1. Formulation of Adding Sukari Dates Fruit Paste in Making Sule Sukari Ice Cream

Ingredient Name	Ingredient Weight				
	t1 (0%)	t2(10%)	t3(20%)	t4(30%)	t5(40%)
Base Ingredient :					
Soy milk (ml)	1000	1000	1000	1000	1000
Skim milk (g)	150	150	150	150	150
Sugar (g)	75	75	75	75	75
Egg yolk (g)	75	75	75	75	75
CMC (g)	7	7	7	7	7
Sukari date fruit paste (g)	0	100	200	300	400

Description : The amount of Sukari date fruit paste (%) is added based on the weight of soy milk.

RESULTS AND DISCUSSION

Organoleptic Properties

Organoleptic properties data were obtained after hedonic tests were carried out by examining the changes that occurred in the color, aroma, taste and texture of Sule Sukari ice cream. This study used 20 moderately trained panelists who are also students of the Department of Nutrition at the Health Polytechnic of Mataram and have fulfilled the requirements as panelists.

The significance of the effect of the addition of Sukari date palm paste on the organoleptic properties of Sule Sukari ice cream can be seen in Table 2.

Table 2. Effect of Addition of Sukari Date Fruit Paste on Organoleptic Properties of Sule Sukari Ice Cream.

Parameter	P (*Value*)	Notation

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Colour	0,000	S
Aroma	0,408	NS
Flavor	0,031	S
Textur	0,017	S

Description : S = Significant
NS = Non Significant

Based on Table 2, it can be seen that the color, taste and texture parameters have a p value <0.05 which means that the addition of Sukari date fruit paste at different levels has a significant effect on the color, taste and texture of the product under study, namely Sule Ice Cream. difficult. While the aroma parameter has a value of p> 0.05 which means that the addition of Sukari date fruit paste does not have a significant effect on the aroma of Sule Sukari ice cream.

The average value of the panelists' preference for the color, aroma, taste and texture of Sule Sukari ice cream can be seen in Table 3.

Table 3. Average Panelist's Preferred Score

Treatment level	Test parameters				Total	Average
	Colour	Aroma	Flavor	Textur		
t1(0%)	3,15	3,40	2,90	3,00	12,45	3,11
t2(10%)	3,40	3,60	3,35	3,40	13,75	3,43
t3(20%)	4,15	3,70	3,65	3,80	15,30	3,82
t4(30%)	3,65	3,80	3,05	3,05	13,55	3,38
t5(40%)	3,15	3,65	3,45	3,35	13,60	3,40

Based on Table 3, it can be seen that the total average preference of panelists for Sule Sukari ice cream as a whole is highest at the t3 level (20%), so that the t3 treatment level (20%) is the selected product which will then be carried out with a proximate test in the form of testing against water content, ash content, protein content, fat content and carbohydrate content because based on the overall test results are the highest values that are preferred by the panelists.

Colour

The results of statistical tests showed that the probability of the color of Sule Sukari ice cream was 0.000 ($p<\alpha 0.05$), which means that the addition of Sukari date fruit paste had a significant effect on the color of Sule Sukari ice cream. Based on the results of the organoleptic test, it can be seen that the color of Sule Sukari ice cream at the treatment level t1 to t5 is in the slightly like to like category.

The color produced by Sule Sukari ice cream in this study was dominated by the brownish yellow color of the basic ingredients of soy milk and the addition of Sukari date fruit paste. The addition of Sukari date fruit paste with a brownish red base color affected the color change in each treatment. The more the percentage of the addition of the Sukari date fruit paste, the more brownish the color of the ice cream will be.

The color of the dates is influenced by the level of maturity, the level of maturity of the dates that are commonly consumed is rutab with the highest level of maturity which is marked by the color of the fruit is brownish red. In addition, the brownish red color of dates is influenced by an increase in the antioxidant content in dates(Arizal, 2015).

Aroma

The results of statistical tests showed that the probability of the aroma of Sule Sukari ice cream was 0.408 ($p>\alpha 0.05$), which means that the addition of Sukari date fruit paste to Sule Sukari ice cream had no significant effect on the aroma of other Sule Sukari ice cream. Based on the results of the organoleptic test, it can be seen that the aroma of Sule Sukari ice cream flavor with treatment levels t1, t2, t3, t4 and t5 is in the category ranging from slightly like to like category with a value range of 3.40-3.80.

The aroma of Sule Sukari ice cream still has the distinctive aroma of soy milk, but with the addition of Sukari Dates fruit paste to the ice cream, the Soy Milk's distinctive aroma is mixed with the Sukari Dates' distinctive aroma. Dates have a characteristic aroma that does not sting so that the addition of dates to a food product will not

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significantly affect the aroma of a product. (Arizal, 2015)

The most preferred aroma by the panelists was in treatment t3 with the addition of fruit paste of Sukari dates by 30% of the weight of soy milk with a hedonic test value of 3.80 which was included in the like category.

Flavor

The result of statistical test showed that the probability of Sule Sukari ice cream taste was 0.031 ($p<\alpha 0.05$), which means that the addition of Sukari date fruit paste had a significant effect on the Sule Sukari ice cream taste. Based on the organoleptic test, it can be seen that the taste of Sule Sukari ice cream with treatment levels t1, t2, t3, t4 and t5 is in the category ranging from slightly like to like category with a value range of 2.90-3.65.

Dates have a sweet taste which is influenced by the level of maturity, at the highest level of maturity, the taste of dates will be sweeter because the sucrose content in dates increases because it has been converted into invert sugar (Arizal, 2015).

Textur

The results of statistical tests showed that the probability of the texture of Sule Sukari ice cream was 0.017 ($p<\alpha 0.05$) which means that the addition of Sukari date fruit paste had a significant effect on the texture of Sule Sukari ice cream. The levels of treatment t1, t2, t3, t4 and t5 were in the category ranging from slightly like to like with a range of values from 3.00 to 3.80.

The resulting texture of Sule Sukari ice cream is soft and dense. The more addition of Sukari date fruit paste, the denser the texture of the ice cream will be. Changes in the texture of the ice cream to become denser with the addition of the Sukari date fruit paste because the dates contain high fiber, namely 6.4% - 11.5% (Arizal, 2015) With the addition of foods that contain high fiber, it can affect the texture of the food to become denser(Lestari, 2015)

The texture of Sule Sukari ice cream that was most preferred by the panelists based on the hedonic test was the addition of 20% sugar palm paste with a value of 3.80 in the like category.

Nutrition Content

The nutritional content of Sule Sukari ice cream can be seen in Table 4.

Table 4. Nutrition Content of Sule Sukari Ice Cream The Best Treatment

Parameter	Unit	Test Methods	Average result (%)	SNI (%)
Water content	% bb	Oven	62,64	
Ash content	% bb	Dry Ashing	0,84	
Protein content	% bb	Kjeldhal	3,70	Min. 2,70
Fat level	% bb	Soxhlet	10,01	Min. 5,01
Carbohydrate	% bb	Differences	22,81	

The nutrition analysis carried out in this study was the product with the best treatment, namely t3 with the addition of 20% sugar palm paste which included water content, ash content, protein content, fat content and carbohydrates. The nutritional content of Sule Sukari ice cream when compared with the Indonesian National Standard (SNI) for ice cream products, Sule Sukari ice cream products with treatment level t3 (20%) have met the quality requirements for protein and fat content in ice cream products.

Water Content

The water content test was carried out to determine the total water contained in Sule Sukari ice cream with the addition of Sukari Dates paste. The water content in a food is very important to maintain the shelf life of the food. Water is an important component in foodstuffs because it affects the appearance, texture and taste of food (Alyanti, Patang dan Nurmila, 2018)

The results of the analysis of the water content of Sule Sukari ice cream showed that the water content was 62.64%. The water content in Sule Sukari ice cream is influenced by the addition of Sukari date fruit paste which in its manufacture uses the addition of water, besides

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that the main ingredient in making Sule Sukari ice cream is soy milk in its manufacture using additional water.

Ash Content

The ash content in food has different amounts. The content of ash and minerals in food is very important to get the ash or minerals needed by the body. In the combustion process, organic materials are burned but the organic matter is not, so that is why it is called ash. Ash content testing is carried out to determine the total ash contained in food products(Hanggara, Astuti dan Setyani, 2016)

Based on the results of the panelists' preference test on the best treatment level, t3, the selected product was then analyzed for ash content. The results of the analysis of the ash content of Sule Sukari ice cream were 0.84%.

Protein Content

Protein is one of the food groups that are found in large amounts (macronutrients). Protein is an important nutrient for the body, because protein functions as fuel in the body and also functions as a building block and regulator. In addition, protein also functions as the formation of new cells to replace cells in damaged tissues and as a source of energy(Hanggara, Astuti and Setyani, 2016)

Protein content according to SNI ice cream is at least 2.7% in 100 grams. Based on the protein content test, it can be seen that the protein content of sule ice cream has met the SNI standard for ice cream.

The proximate test results of Sule Sukari ice cream contain 3.70% protein, which means that in 100 grams of Sule Sukari ice cream there are 3.70 grams of protein. The protein requirement for an interlude for elementary school-aged children is given 10% of the total protein requirement based on the 2019 Nutritional Adequacy Ratio (RDA) which is 5 grams. So to meet the needs of the protein interlude, Sule Sukari ice cream is given in the amount of 135 grams to meet the protein needs for the child's interlude.

Fat Level

Fat is a source of essential fatty acids which are also a means of transport and solvent for vitamins A, D, E and K. The use of fat in food is not only to add calories, but also to improve texture and taste. The fat component gives the product physical characteristics such as aroma, taste, texture and appearance. Product characteristics disappear when the fat in the food is reduced or eliminated (Dewanti dan Rahayuni, 2013)

The fat quality standard for ice cream based on SNI is at least 5.0%(BSN, 1995). Based on the results of the proximate test for the fat content of Sule Sukari ice cream, the results obtained are 10.01% so that the fat quality requirements for Sule Sukari ice cream have been met.

Carbohydrate

Carbohydrates have the main function of providing the need for energy. However, the function of carbohydrates is not only as a source of energy but has other functions in metabolic processes in the body(Qurnaini, Nasrullah dan Fauziyah, 2021)

Based on the results of the hedonic test at the best treatment level, t3, then the carbohydrate test was carried out. The results of the carbohydrate test were obtained from calculations using the by different method by taking into account the results of the test for ash content, water content, protein content and fat content which were then reduced by 100% so that the results were 22.81% for the carbohydrate content of Sule Sukari ice cream. This means that in 100 grams of Sule Sukari ice cream there are 22.81 grams of carbohydrates, when compared to the carbohydrate needs for a child's interlude based on the 2019 RDA which is 30 grams, the amount of Sule Sukari ice cream that must be consumed to meet the carbohydrate needs is 131 ,5 grams.

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Receptivity

The results of the acceptance test of Sule Sukari Ice cream can be seen in Figure 1.

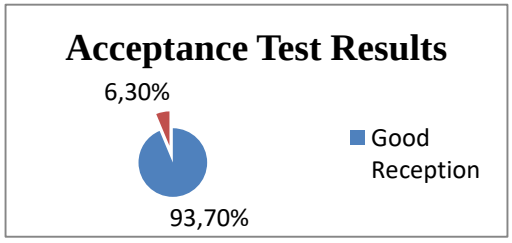

Figure 1. Acceptance Test Pie Diagram

The panelists used in this acceptance were 32 elementary school-aged children at SDN Bejelo, Central Lombok. Based on table 14, it can be seen that from 32 children, there are 30 children (93.7%) who can receive well (≥ 80% eaten) and 2 children (6.3%) with less acceptance (<80% eaten).

The results of the acceptance of 32 children with good acceptance gave a response that the Sule Sukari ice cream product had a delicious and sweet taste from the addition of date paste. Consumers also stated that the texture of Sule Sukari ice cream was also quite soft and dense.

The results of the acceptance of 2 children with poor acceptance stated that the Sule Sukari ice cream was delicious but the texture was still too dense. In addition, they had previously eaten first, so they felt full. And can't finish the 1 serving of ice cream sule sukari (135 g) given. In one time, Sule Sukari ice cream consists of 2 cups weighing 135 grams. Seeing the response of 30 people to good acceptance, it can be concluded that Sule Sukari ice cream has a great chance of being used as a snack for elementary school-aged children.

CONCLUSIONS

Based on organoleptic test analysis, nutrient content test and acceptance test of Sule Sukari ice cream, the following conclusions can be drawn:

1. The addition of Sukari date fruit paste gave a significant effect on the color, taste and texture of Sule Sukari ice cream ($p<0.05$) while for aroma there was no significant effect ($p>0.05$).
2. Sule Sukari ice cream in t3 treatment was the best from the results of the organoleptic tests carried out. The results of the nutrient content test (proximate test) of Sule Sukari ice cream have met the SNI standard for ice cream products. The nutritional content of Sule Sukari ice cream is 62.64% water content, 0.82% ash content, 3.70% protein content, 10.01% fat content, and 22.81% carbohydrate content.
3. The results of the acceptance test of Sule Sukari ice cream can be well received by consumers of elementary school age children. The number of elementary school age children with good acceptance is 30 children (93.7%) and less acceptance is 2 children (6.3%)

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