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Acceptability Of Red Bean-Based Filter Porridge *(Phaseolus Vulgaris L)* In Patients With Oral Diet Via RSUD Undata Province Central Sulawesi

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ABSTRACT
One way to improve the quality of filter food and prevent the amount of food waste in patients receiving a filter food diet is to modify the menu so that the filter food still has nutrients that meet the patient's needs and has a taste, aroma, and texture that can increase the patient's appetite. The type of food that can be modified in the filter food menu is the use of red beans which have nutrients that are rich in vitamins, minerals and bioactive compounds. Objective: to determine the acceptability of red bean-based filter porridge (Phaseolus Vulgaris L) to patients with oral diet at RSUD Undata, Central Sulawesi Province. This study used a quasi-experimental design. The data collection technique used an acceptability questionnaire. Data analysis included univariate and bivariate using one sample Kolmogorov Smirnov test. Based on the results of bivariate analysis using the one sample Kolmogorov Smirnov test, the results of the acceptability of aroma, color, texture, and taste were obtained with a value of p = 0.000, which means that there is an effect of the acceptability of red bean-based filter porridge (PhaseolusVulgaris L) on the acceptability of taste, aroma, texture, and color of patients with oral diet at RSUD Undata, Central Sulawesi Province. Conclusion: The acceptability of red bean (PhaseolusVulgaris L) based filter porridge has good taste, aroma, texture, and color acceptability.It is expected that further research to analyze the nutrient levels of carbohydrates, protein and fat as well as calories in red bean-based filter porridge and use comparison samples on the acceptability of red bean-based filter porridge with hospital formulated filter porridge.

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INTRODUCTION

Hospitals play a role in providing nutritional services that aim to improve patient health. The target of service quality is patient satisfaction with safe and satisfactory health status as well as effective and efficient use of hospital resources (Manorek *et* al 2020) . Nutritional therapy as an effort to promote promotional, preventive and rehabilitative nutritional services is integrated with nutritional services that aim to cure patients (Sunatrio, 2019) . One of these things is related to nutritional services in providing patient food

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The types of food available in hospitals are different in each hospital, examples of types of food in hospitals are regular food (solid food), soft food (coarse porridge), refined food (filtered food and liquid food) (Indonesian Ministry of Health, 2013) . Undata Hospital, Central Sulawesi Province, based on the 2023 nutrition report, provided a total of 4,546 portions of filtered food. The composition of filtered food at Undata Hospital consists of porridge, animal protein side dishes, vegetable protein side dishes, and vegetables which are blended together to produce 1 filtered food product.

One of the foods given according to the patient's condition is filtered food, but research presented by Lestari and Marlina (2021) at Petala Bumi Hospital, Riau Province shows that most of the food waste based on the form of food is filtered food, where food waste reaches 100%. This can be caused because the appearance of the filtered food is considered unattractive and the texture of the filtered food is semi-solid causing the patient to lose appetite and feel nauseous. Apart from that, when smelling food, sufferers do not want to eat and accept food from outside their family.

Based on interviews conducted with patients at the Undata Regional Hospital who received filtered diets orally, it was found that patients tended to leave filtered food behind because the taste was less appetizing. This was due to the taste of the filtered porridge being bland, which reduced the patient's appetite. Based on the interview, it was found that the patient only spent ¼ or 25 % of filtered food given, in other words, the patient leaves 75% of the filtered food given.

Apart from this research, there is research put forward by (Kusumawati, 2016) explained that there was 67% of filtered food remaining, this was because the filtered food looked unpalatable, and the taste did not suit the patient's taste, resulting in a large amount of filtered food remaining. From the results of a preliminary survey also in Maryam's (2019) research at Saiful Anwar Regional Hospital, Malang, it was shown that patients who received a filtered food diet often delayed eating and divided their meals into several small portions.

One way to improve the quality of filtered food and prevent a lot of food waste in patients who receive a filtered food diet is that it is necessary to modify the filtered food menu so that the filtered food still has nutrients that meet the patient's needs, and has a taste, aroma and texture that can be used. increase the patient's appetite. The type of food ingredient that can be modified in the filtered food menu is the use of red beans as a vegetable ingredient, where nuts are a food that can be used as a source of quality vegetable protein. Nuts have nutrients that are rich in vitamins, minerals, bioactive compounds such as sources of phenolic compounds which play a role in various physiological and metabolic processes in humans (Diniyah and Lee, 2020) .

Red beans have health benefits, but red beans cannot be eaten raw and require special handling. This is because red beans contain several anti-nutritional compounds such as phytic acid, hemagglutinin, antitrypsin, and goitrogens, and these substances can inhibit the digestion of food components (Agranoff *et al,* 2001) . Processes that can be used to remove anti-nutritional compounds include soaking, boiling, acid soaking, and mold fermentation (Audu and Aremu, 2011) .

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Other studies also provide evidence of the use of red beans including increasing hemoglobin levels, based on research showing that consumption of red bean juice affects hemoglobin levels in young women. It was seen that the average hemoglobin level in the control group was previously 11.17 g/dl, but after that it became 11. .14 g/dl. The mean hemoglobin value in the intervention group was 11.14 g/dL before and 13.16 g/dL after administration of red bean juice (Fitri *et al* ., 2022) . Utilization of red beans also has benefits because red bean ethanol extract is effective in lowering cholesterol levels. in mice induced by a high-fat diet (Furon *et al* ., 2021) . Based on this background, the researchers wanted to make a modification of filtered porridge made from red beans (*Phaseolus Vulgaris L*) and see the patient's acceptance of this filtered porridge at Undata Hospital, Central Sulawesi Province.

METHODS

This research design is a quasi-experimental research by carrying out a red bean-based asaring porridge formulation to assess the acceptability of respondents in this study regarding the red bean-based asaring porridge formulation. This research was carried out in June at Undata Hospital, Palu, Central Sulawesi Province. The sample in this study consisted of 30 respondents with data collection techniques using purposive sampling techniques. The ingredients used in this research were egg whites, carrots, potatoes, coconut milk, red beans, garlic, onions and water. The tools used in making strained porridge are a stove, pan, baking sheet, spatula, blender, cup, spoon, cutting board and questionnaire. Data analysis uses univariate and bivariate analysis.

RESULTS AND DISCUSSION

This research was to determine the acceptability of filtered porridge based on angry beans (Phaseolus Vulgaris L) in patients on an oral diet at Undata Hospital, Central Sulawesi Province.

Univariate Analysis

Description of the frequency distribution of respondent characteristics based on gender and latest education.

Table 1 Frequency distribution of respondent characteristics based on gender and last education.

Variable	*F*	%
Gender		
Man	17	56.7
Woman	13	43.3
Last education		
Not yet in school	1	3.3
elementary school	5	16.7
JUNIOR HIGH SCHOOL	2	6,7
SENIOR HIGH SCHOOL	11	36.7

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Variable	*F*	%
D3	2	6,7
S1	9	30

Based on Table 4.1, it is known that the frequency distribution of respondents' characteristics based on gender shows that the frequency distribution results show that most of the respondents were 17 men (56.7%) while 13 were women (43.3%). And the results regarding the characteristics of the latest education show that 1 person (3.3 %) has not yet studied, 5 people have elementary school (16.7%), 2 people have middle school (6.7%), 11 people have gone to high school (36.7%), D3 2 people (6.7%), and S1 9 people (30%).

Description of distribution of acceptability of red bean based filtered porridge

Table 2 Distribution of acceptability of red bean-based strained porridge

Variable	*f*	%
Aroma		
Really like	4	13.3
Like	23	76.7
Don't like it	3	10
Color		
Really like	2	6,7
Like	26	86.7
Don't like it	2	6,7
Texture	11	36.7
Really like it	2	6,7
Like it	25	83,3
Less Likes	3	10
Taste		
Really like it	3	16,7
Like it	22	73,3
Less Likes	5	10

As for the assessment of the acceptability of the aroma. color, texture, the results of the overall acceptability analysis, the majority of respondents rated the taste of red bean-based strained porridge as favorable. Where color acceptability was 23 (76.7 %) who liked it, and 4 people (13.3%) who liked it very much and 3 people (10%) who did not like the aroma of filtered porridge. Overall color acceptability of patients liked the color of the strained porridge with 26 people (86.7%) choosing to like it and 2 people (6.7%) choosing to like it very much and 2 people (6.7%) choosing not to like it. Texture acceptability is known that 25 people (83.3%) chose to like it and 2 people (6.7%) chose to like it very much and 3 people (10%) chose to dislike it. And regarding acceptability, it was found that 22 people (73.3%) chose to like it, and 3 people (10%) chose to like it very much and 5 people (16.7%) chose to dislike it.

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Bivariate Analysis

The results of the bivariate analysis carried out in this study used the non-parametric one sample Kolmogrof-Smirnov test with the following results:

Table 2Average Value of Aroma Acceptance

Receptivity	Mean	Min	Max	N	Std. Deviatiom	p value
Aroma	4	3	5	30	0.490	0,000
Color	4	3	5	30	0.371	0,000
Texture	4	3	5	30	0.414	0,000
Flavor	4	3	5	30	0.521	0,000

Based on table 3, it shows that there is a significant relationship between aroma, color, texture and taste. At the 5% level, the Kolmogorov–Smirnov one sample test to determine a p value <0.05 or 0.000 means there is an influence on the acceptance of strained porridge made from red beans (Phaseolus Vulgaris L).

Discussion

Aroma

The olfactory nerve of the nasal cavity is responsible for detecting food aromas produced by chemical stimuli. Acceptability can be significantly influenced by a food's aroma, which is closely related to its taste. Based on the results of research on red bean-based strained porridge, an average result of 4 was obtained with a p value *of* 0.000 (<0.05). The aroma of this red bean filtered porridge tends to have the aroma of coconut milk with a slight aroma of red beans, thus increasing the acceptability of the filtered porridge so that most respondents like the aroma of this red bean based filtered porridge.

This is in line with research by Afia *et al,* (2021) shows that the proportion of coconut milk in instant risotto products has a significant effect with a p value of 0.000 (<0.05) on the aroma so that there is an influence of the use of coconut milk on the aroma of the risotto. The respondents who chose to dislike the aroma of red beans were because respondents did not like red beans in food, which reduced their acceptance. This is in line with the findings of Damayanti et al, (20 20) stated that in cookies made from 80% wheat flour and 20% rice bran flour and red beans where the addition of red bean flour produces an unpleasant or unpleasant smell , and the average is 2.44 so the aroma is less acceptable.

The addition of coconut milk in this study can cover the distinctive aroma of red beans which is quite unpleasant, which happens because red beans contain the enzyme lipoxyginase which will produce a pleasant aroma or beany flavor (Afiska et al, 2021) . This is in line with research by Fanny et al, (2021) which suggests that the aroma of red beans can be masked by the distinctive aroma of coconut milk so that in this study the p value = 0.545 meaning that the addition of red beans and papaya to coconut milk ice cream has no effect in terms of aroma.

Coconut milk can improve the taste, nutritional value and texture of processed foods by being added during the cooking process. The nonylmethylketone compound found in coconut milk evaporates at high temperatures and produces a fragrant aroma that can increase the acceptance of the aroma of food (Safira *et al,* 20 21) .

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Color

Color has an attraction to food where an attractive color combination will increase food acceptance which will increase appetite (Afiska et al, 2021) . There are several components that form color in food, such as natural pigments in a material, Maillard reactions, reactions between organic compounds.

Based on the research results, it is known that the average color acceptability of this red bean-based strained porridge is 4 with a value of p=0.000 (<0.05). The research results from making red bean-based strained porridge produced a dark red color and most respondents liked the color of the red bean-based strained porridge. There were 2 respondents who chose not to like it because they didn't like the red color of the red beans. The color of red bean-based strained porridge tends to be red, this is in line with research by Afiska et al, (20 21) where the increasing use of red beans in red bean pudding can attract attention because of the color pigments contained in red beans so that panelists prefer the treatment. with a higher composition of red beans.

A study conducted by Parumpa et al, (2023) in 2023 found that instant porridge with the addition of goroho flour (40%) and red bean flour (60%) had the highest color hedonic value, so that the color acceptability value of instant porridge increased. increased with the addition of red bean flour . Apart from that, research presented by (Wulandari *,* 20 22) shows that there is a real difference in the color of pinkuik cake where the highest acceptance of pinkuik cake is the formulation with the addition of red beans with a p value < 0.05, namely 0.012, meaning there is a real difference in the color of pinkuik cake (Wulandari *,* 20 22) .

Texture

Consumer acceptance is influenced by texture, which is the result of contact between the hand and the mouth when chewing. Based on research on red bean-based strained porridge, it is known that the average value is 4 and the p *value is* 0.000 (<0.05). Based on this research, filtered porridge has a soft texture and has a thick consistency so that the majority of respondents like this filtered porridge. Apart from the red beans used in the research, one of the ingredients that influences the texture is coconut milk which is a food raw material which is generally used as a food complement. in everyday life. The addition of coconut milk provides a creamier, softer texture and provides a distinctive taste (Raharjanti et al, (2019) .

Some respondents did not like the texture of strained porridge because of the presence of red beans, where research presented by Afiska et al, (2021) showed that the red bean pudding formulation with the least red bean formulation was preferred by the panelists because the texture was softer with a value of p *value* 0.002 (<0.05).

Research by Fanny *et al,* (2021) found a significant value of p=0.025 for coconut milk ice cream with the addition of red beans and papaya, which is a factor that contributes to the sensory texture quality. Based on the sensory test , it was found that the test participants liked coconut milk ice cream the most in terms of consistency, formula F2 with the "very like " category. However, adding more than 20 grams of red bean puree to the F3

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formulation reduces the palatability for respondents because F3 tends to have a coarser texture than other formulations.

However, in the research on red bean-based strained porridge, grinding was carried out using a blender on the boiled red beans so that the red bean-based strained porridge was softer, this caused more respondents to like it than respondents who liked the texture of this red bean-based strained porridge.

Flavor

Taste is a factor that determines the acceptability of a product. In the research, it is known that the average value is 4 and the p *value is* 0.000 (<0.05). The taste of this strained porridge tends to be savory and sweet and the taste of red beans is quite pronounced so that most respondents like the taste of red bean-based strained porridge. In accordance with research conducted by Afiska et al (20 21) , the results showed that the more red beans used made the pudding taste more red bean with a p value of 0.030 .

Hapsari's research (2018) using a single ANOVA test, the p value of the product proportion of red bean puree and wheat flour with honey sweet potato puree was 5,783 with a significant value of 0.004 (< 0.05) where in this study it was explained that the glutamic acid found in red beans appeared to be plays a role in changing the taste of mud cake. Adding glutamic acid to foods and snacks results in a more balanced flavor profile. The glutamic acid content in 100 grams of dried red beans is 190.16 mg. A study conducted in 2013 revealed that red bean flour cakes vary in taste depending on the amount of mixture used. This leads us to believe that the taste is the result of the protein in red beans. The taste of red beans is believed to be caused by the protein they contain (Wiranata, 2017).

Processing stages are a determining factor in the quality of red beans. If handled properly, the unpleasant or unpleasant taste will be reduced. When processing red beans, they must first be soaked in water and then cooked. (Hapsari 2018) . So in this study, the red bean-based filtered porridge did not have a pleasant smell which would affect the taste of the red beans. Apart from that, the addition of coconut milk, potatoes and brown sugar could enrich the taste of the red bean-based filtered porridge. However, in this study it was discovered that 5 people out of a total of 30 respondents did not like red bean-based strained porridge because the patients did not really like the taste of red beans so these respondents did not like the taste of red beans.

Supporting this conclusion, research by Damayanti *et al,* (2020) proves that the acrylamide compound in added red beans gives a bitter taste to the cake which makes it less acceptable, adding more red bean flour to the cake recipe will worsen the taste. With a mixture of wheat flour and an increase in the red bean formula, it produces a value of taste acceptability lower, with an average score 2.60.

CONCLUSION

Description of the acceptability of red bean-based strained porridge for aroma: 13.3% of respondents really like it, 76.7% of respondents like it and 10% of respondents don't like it. 6.77% of respondents really like Warma, 86.7% of respondents like it and 6.7% of respondents don't like it very much. 6.7% of respondents really like the texture, 83.33% of

respondents like it and 10% of respondents don't like it. The taste of 16.7% of respondents really likes it, 73.3% of respondents like it and 10% of respondents don't like it. The aroma of strained porridge tends to be liked by respondents, namely patients who receive oral strained porridge with an average value of 4 and a p value of *0.000* (<0.005). The color of filter porridge tends to be liked by respondents, namely patients who receive oral filter porridge with an average value of 4 and a p value of *0.000* (<0.005). The texture of filtered porridge tends to be liked by respondents, namely patients who receive oral filtered porridge with an average value of 4 and a p value of *0.000* (<0.005). The taste of strained porridge tends to be liked by respondents, namely patients who receive oral strained porridge with an average value of 4 and a p value of *0.000* (<0.005).

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