



UTILIZATION OF RED DRAGON FRUIT PEEL-BASED CREAM SOUP

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Abstract

Dragon fruit skin has the potential to be used as a base for cream soup. This research aims to innovate red dragon fruit skin by carrying out the right process to produce delicious cream soup. The red dragon fruit skin is processed into puree or ingredients that have been softened to make it safe and mixed with spices to make it creamy. The method used includes processing dragon fruit skin into puree, then mixing it with spices and other additional ingredients. The results of the hedonic quality test show that the cream soup produced has a creamy texture and has a different taste from cream soups in general which usually use potato as the base ingredient. Based on research conducted, red dragon fruit peel as the main ingredient in making cream soup provides satisfactory results. Red dragon fruit skin is rich in fiber and antioxidants, so it not only uses food waste, but also increases the nutritional content of the product.

Keywords: Innovation, Dragon Fruit Skin, Cream Soup.

INTRODUCTION

Street food is food and beverages that are prepared and sold on the streets or crowded public places by traders, which can be consumed directly without the need for additional processing or preparation (Rahman, 2022). Based on Government Regulation No. 28 of 2004, hawker food is food or drink that has gone through a processing process to become various types and is ready for direct consumption, either at the business location or outside. According to the *World Health Organization* in (Rahman, 2022) hawker food includes food and beverages sold by traders on the street or public gathering places, ready for direct consumption without additional processing. Dragon fruit skin is generally discarded and not utilized, even though about 30-35% of the weight of dragon fruit is the skin (Fian, 2024). These skins are often considered waste even though they are actually rich in nutrients, including antioxidants, fiber, and vitamins and minerals that have the potential to support health, especially to fight free radicals, maintain digestive health, and reduce cholesterol and blood sugar (Faradila, 2024). According to Palupi et al. (2021), red dragon fruit skin is known to contain a variety of nutrients, including fiber, vitamins, minerals, and phenolic compounds that have antioxidant activity.

Red dragon fruit has become an increasingly popular tropical fruit in the last decade, most notably in Asian countries, such as Indonesia (Aryanta, 2022). Originally, the red dragon fruit plant was known as an ornamental plant because it has a unique triangular stem with short thorns. The flowers are also funnel-shaped, which begin to bloom at dusk and reach full bloom at midnight (Nilawati, 2019). A Frenchman then brought this plant to Vietnam as an ornamental plant, which became the beginning of its spread to various other regions (Aryanta, 2022). Red dragon fruit is a



popular fruit among the public because it has various health benefits. According to Puspawati and Riyani in (Thasya, 2024), about 30% to 35% of the total red dragon fruit is usually discarded as skin waste. However, the skin of red dragon fruit (*Hylocereus polyrhizus*) contains betasianin pigment which can be utilized as a natural colorant in ice cream products. In addition, red dragon fruit is also rich in phenolic compounds that function as antioxidants (Apriliyanti, 2020). This action generally aims to obtain or use useful things, either directly or indirectly, in order to provide benefits (Taroreh et al., 2019). Utilization effectiveness refers to the use of resources, facilities, and infrastructure in a certain amount that has been predetermined with the aim of completing the work on time (Sahid & Masse, 2023). In developing the tourism sector, by utilizing rural assets, portfolio development can be carried out without sacrificing the typical rural image (Oktawirani, 2023). In the tourism development process, it is important to conduct an analysis to identify the strengths, weaknesses, opportunities, and threats of the innovations that have been implemented, so that more effective strategies can be applied in advancing this industry (Wardaya, 2022).

The skin of red dragon fruit is usually discarded or not eaten, but some people utilize it in beauty, health, or animal feed products (Faradila, 2024). The use of red dragon fruit is the main object to be studied because it has many advantages over other types of dragon fruit. According to research (Sardin et al., 2023), red dragon fruit skin has advantages in the form of beneficial betalain and anthocyanin content, so it can be used as a natural dye. Utilization is the process or result of developing ideas or utilizing existing products or resources, resulting in more useful value (Puspawati & Riyani, 2021). Eco-friendly hotel practices aim to reduce negative impacts on the environment through energy savings, reduced water consumption, and management and reduction of food waste such as red dragon fruit peels (Abdou et al., 2020). The use of cream soup as a combined object is not by chance, soup is known to have a variety of health benefits, which is very important especially during a pandemic like today (Carla, 2022). This utilization has the potential to reduce organic waste, utilize red dragon fruit skin to produce nutritious food, and open new opportunities in the culinary industry (Carla, 2022). Red dragon fruit was chosen as an additional ingredient in cream soup because its skin contains phenolic compounds and antioxidants that are beneficial for health (Nolandi & Kusumastuti, 2019).

Research from (Ginting, 2023) related to the utilization of red dragon fruit for health needs through cream. Other research from (Dinna, 2024) related to the utilization of red dragon fruit to be used as a sauce. Other research from (Thasya, 2024) related to the use of red dragon fruit in raw materials for *ice cream* products. According to (Rusmiati, 2019), ice cream or cream soup is a dairy product that is popular among people of various ages, both young and old. Based on the background of this study aims to determine whether red dragon fruit skin can be made into cream soup and how the level of public liking for red dragon fruit skin cream soup.

RESEARCH METHOD

This research was conducted to prove that red dragon fruit skin can be made into cream soup by using information from various methods, such as product trials and giving testers to validators. Researchers made this idea because of the lack of utilization of red dragon fruit skin, so researchers made cream soup from red dragon fruit skin as the main ingredient of product



utilization. This product was assessed by several people who have a relationship with the hospitality industry, especially in the culinary field. With careful planning, the author can make products that are delicious and liked by the public. Design validation is done to assess the product in terms of texture, taste, aroma, and color. This assessment is made to ensure that the products made meet the quality standards of the product. Through the design validation process, this product can be tested and refined according to standards so that it can be accepted by the public. After conducting design validation, the author then summarized it into a SWOT analysis (*Strength, Weakness, Opportunity, and Threats*).

Product revision was carried out twice, the first product test was carried out on November 19, 2024. The second product test was conducted on November 26, 2024 (1 week difference). Panelists who filled out the form on November 19, 2024 were asked to fill out a question revision form on November 26, 2024. The product test results showed significant differences in the raw materials used, the amount of ingredients in one serving of red dragon fruit skin cream soup, and the method of serving. In the first test, the raw materials used were less and had a different composition compared to the old recipe. In addition, the amount of ingredients used in one serving of red dragon fruit skin cream soup also changed to achieve a better balance of flavor and texture. The method of serving is also one of the factors considered in this trial. In the new recipe, the presentation was done in a slightly different way to improve the presentation and overall eating experience. At each revision, adjustments were made to the ingredient amounts, cooking techniques, and serving methods to achieve richer flavors and softer textures. This research still uses a combination of quantitative methods (SWOT, observation, and survey) to get an overview of the research on the product. Data in the form of numbers from the questionnaire results will be processed using statistical methods. The results of the questionnaire will answer the research questions that have been formulated.

RESULT AND DISCUSSION

The initial product design of "Utilization of Red Dragon Fruit Skin-based Cream Soup" focused on utilizing red dragon fruit skin waste as the main ingredient that is rich in nutrients, such as fiber and antioxidants, to create a healthy, delicious and environmentally friendly cream soup. The product is designed with a soft texture and savory taste enriched by additional ingredients such as potatoes, broccoli, and cream, as well as complementary croutons and herbs to provide a unique culinary sensation. In this study, utilization was carried out in the processing of cream soup by utilizing red dragon fruit skin as the main ingredient. The purpose of this development is to increase the use value of red dragon fruit skin which is often considered waste, while creating food products that are nutritious and have a delicious taste. As a savory flavor enhancer, 20 grams of butter was used. In addition, additional seasonings such as seasonings, herbs, and croutons (small pieces of toasted bread) were used to complement and enhance the texture. Assessment of hedonic quality test with the categories of Unattractive (TM), Less Attractive (KM), Attractive (M), Very Attractive (SM). Based on the Hedonic Quality Test of the old recipe, a new recipe hedonic and hedonic quality test was made with the following results:

Table 1. Hedonic Quality of New Recipe Red Dragon Fruit Peel Cream Soup

Description	Category	Amount (n)	Percentage
Red Dragon Fruit Peel Cream Soup in terms of Taste	M	1	33%
	SM	2	67%
	Total	3	100%

Description	Category	Amount (n)	Percentage
Red Dragon Fruit Peel Cream Soup in terms of Texture	M	1	33%
	SM	2	67%
	Total	3	100%

Description	Category	Amount (n)	Percentage
Aroma-wise Red Dragon Fruit Peel Cream Soup	SM	3	100%
	Total	3	100%

Description	Category	Amount (n)	Percentage
Red Dragon Fruit Peel Cream Soup in terms of Color	M	1	33%
	SM	2	67%
	Total	3	100.0

Source: Data processing results (2024)

The table above presents the hedonic quality test results of the red dragon fruit skin-based cream soup with the new recipe, which was evaluated from the aspects of taste, texture, aroma, color, and overall product. The assessment was conducted using two categories, namely "Interesting" (M) and "Interesting Like" (SM), with a relatively small number of respondents (3 people). The following is a summary of the results. On the flavor aspect, 33% of the respondents rated it as "Interesting" while 67% chose "Interesting Like." The average rating in this category was 3.66, indicating quite varied perceptions among respondents. In terms of taste, the Red Dragon Fruit Peel Cream Soup received a good response. The resulting taste is considered to be balanced between the savory and natural sweetness of the main ingredients. The presence of additional seasonings also helped to enrich the flavor, thus providing a pleasant taste experience.

In terms of texture, all respondents (100%) gave a rating of "Very Attractive" resulting in an average score of 3.66. These results indicate that the texture of the product was highly appreciated by all respondents. Panelists generally gave a positive response to the texture of Red Dragon Fruit Peel Cream Soup. The texture of the product was considered soft and in accordance with the characteristics of cream soup, which provides a comfortable and pleasant consumption experience. For the aroma aspect, the majority of respondents (100%) gave a rating of "Very Attractive" for this category of 3.00 signifying full agreement among respondents on the quality of the product aroma. The aroma of the product also received positive appreciation from the panelists. The fragrance produced is considered to be able to increase the attractiveness of the product, with a balance of aromas that give a refreshing and appetizing impression.

In the color evaluation, 33% of respondents rated "Attractive" while 67% chose "Very Attractive." The average rating for color was 3.66 which was similar to the results in the taste aspect. The color of Red Dragon Fruit Peel Cream Soup is one of the most preferred aspects by the panelists. The appearance of bright and attractive colors provides a strong visual appeal, so the product looks tempting to enjoy. After conducting the hedonic quality test, the hedonic test was carried out with the categories of Dislike (TS), Less Like (KS), Like (S), Very Like (SS). The following is the hedonic test for the New Recipe Red Dragon Fruit Skin Cream Soup:

Table 2. Hedonic Test Results of Red Dragon Fruit Skin Cream Soup

Description	Category	Amount (n)	Percentage
Overall Assessment of Red Dragon Fruit Peel Cream Soup Product	SS	3	100%
	Total	3	100%

Source: Data processing results (2024)

The overall assessment of the product also showed that the majority of respondents (100%) gave the category "Like Like" with an average overall score of 3.00 indicating high acceptance of the product in general without any differences in opinion. Overall, the Red Dragon Fruit Peel Cream Soup was well received by the panelists. The combination of taste, aroma, texture, and color produced a product that met expectations and provided a satisfying consumption experience. Assessment of the hedonic quality test with the categories of Unattractive (TM), Less Attractive (KM), Attractive (M), Very Attractive (SM). The following is the hedonic test of the revised red dragon fruit skin cream soup:

Table 3. Revised Hedonic Quality Test Results of Red Dragon Fruit Peel Cream Soup

Description	Category	Amount (n)	Percentage
Red Dragon Fruit Peel Cream Soup in terms of Taste	M	6	30%
	SM	14	70%
	Total	20	100%
Description	Category	Amount (n)	Percentage
Red Dragon Fruit Peel Cream Soup in terms of Texture	M	5	25%
	SM	15	75%
	Total	20	100%
Description	Category	Amount (n)	Percentage
Aroma-wise Red Dragon Fruit Peel Cream Soup	M	8	30%
	SM	12	60%
	Total	20	100%
Description	Category	Amount (n)	Percentage
Red Dragon Fruit Peel Cream Soup in terms of Color	M	6	30%
	SM	14	55%
	Total	20	100%

Source: Data processing results (2024)

The table shows the evaluation results of the red dragon fruit peel-based cream soup product assessed in terms of taste, texture, aroma, color, and overall product acceptance. The assessment was carried out by 20 respondents using the categories "Interesting" and "Very Interesting". These results provide an initial overview of the potential acceptance of the product in the market for innovative foods made from natural ingredients. In the taste aspect, the majority of respondents gave a rating of "Very Attractive" with a percentage of 70%, while the remaining 35% gave the category "Attractive". The average rating on the taste aspect was 3.70, reflecting the consistency of respondents' perceptions of the product's taste. This shows that the taste of the cream soup successfully met the panelists' expectations, which is an important asset to attract consumers. The texture of the product was the aspect that received the highest rating, with 75% of respondents giving the category "Very Attractive" while the other 25% rated it "Attractive". The average rating for this aspect reached 3.75, indicating a very good level of satisfaction with the texture dimension. This result confirms that product texture is a competitive advantage that can be relied upon to build differentiation in the market.

The aroma aspect showed slightly different results compared to the other aspects, with 60% of respondents categorizing it as "Very Attractive" while 40% rated it as "Attractive". Although the average aroma rating reached 3.60, indicating a slight variation in respondents' perception of the product's aroma. This indicates that there is room for improvement in the aroma dimension, which can be done by adjusting the composition of ingredients to produce a more distinctive and attractive aroma. On the color aspect, the majority of respondents (70%) rated the product as "Very Attractive" while the rest (30%) rated it as "Attractive." The average color rating was 3.70, which is similar to the results on the taste aspect. Attractive product colors provide added value in creating a positive visual impression, which is important in attracting consumer attention at an early stage. After conducting the hedonic quality test, a hedonic test was conducted with the categories of Dislike (TS), Less Like (KS), Like (S), Very Like (SS). The following is the hedonic test for the revised red dragon fruit skin cream soup:

Table 4. Revised Hedonic Test Results of Red Dragon Fruit Peel Cream Soup

Description	Category	Amount (n)	Percentage
Overall Assessment of Red Dragon Fruit Peel Cream Soup Product	S	7	35%
	SS	13	65%
	Total	20	100%

Source: Data processing results (2024)

The overall assessment of the product showed that 65% of respondents categorized it as "Liked Very Much," while the remaining 35% rated it as "Liked." The overall average reached 3.65 which illustrates the very positive acceptance of the product in general. These results indicate that the red dragon fruit skin cream soup product has the potential to be developed further and marketed widely. Overall, the evaluation results showed that the red dragon fruit peel-based cream soup



product received good acceptance from respondents. The texture aspect was the main advantage with the highest rating, while aroma was the aspect with the lowest average rating. Nonetheless, these results show that the product has generally succeeded in meeting respondents' expectations on the various aspects tested. With a little bit of utilization, especially on the aroma aspect, the product can be more competitive in the healthy and innovative food market, strengthening its position as a unique eco-friendly natural option.

The following is a SWOT analysis based on the Hedonic Quality test data of 20 panelists on the revised Red Dragon Fruit Peel Cream Soup product. In the strengths aspect of the hedonic quality test results from 20 panelists, this product has advantages in texture, taste, and color. The texture aspect received an average score of 3.75, with 75% of the panelists giving a rating of "Very Liked (SM)". This indicates that the product has a texture consistency that meets consumer expectations. The taste and color aspects also scored high, each with an average of 3.70, where 70% of the panelists gave a rating of "Very Liked (SM)." Overall, the product received an average score of 3.65 with 65% of the panelists stating "Liked Very Much (SS)." This indicates that the red dragon fruit skin cream soup has significant appeal, especially in the aspects of texture and flavor that are consistent and appealing to consumers.

While the overall product assessment of *Weaknesses* was positive, **aroma** was the aspect that had the lowest score compared to other aspects. The average score for aroma was **3.60**, with only **60% of the panelists** rating it as "Liked (SM)," while **40% of the panelists** rated it as "Liked (M)." This indicates the variation in panelists' perception of the product's aroma. The less-than-optimal aroma may be due to the basic ingredients or product formula that needs to be refined. Opportunities the use of red dragon fruit **skin** as the main ingredient provides uniqueness and added value to the product. Consumer trends that are increasingly interested in **healthy, natural, and innovative** foods are a great opportunity for this product. The combination of good texture, interesting taste, and attractive color can be a marketing attraction for the product. *Threats* of the healthy and innovative food market continues to grow with increasingly fierce competition. Basically, dragon fruit skin cream soup melts easily at room temperature and the cream in the garnish can affect the color of the product. Many similar products offer **unique** and **healthy** concepts, thus requiring this product to have a **strong differentiation strategy** in order to compete. In addition, the use of red dragon fruit skin, although innovative, may raise **consumer doubts** regarding the flavor or health benefits of the product.

Discussion

This product has great potential in the real world. The use of red dragon fruit peels, which usually become waste, reflects sustainability-based utilization. This is relevant to modern society's awareness of red dragon fruit peels, commonly referred to as food waste, to preserve the environment. Moreover, in an era where consumers are increasingly looking for healthy food alternatives, this soup can be an attractive option due to its fiber and antioxidant content. In a market dominated by conventional instant soups, the presence of this product as a new variant can provide a different experience for consumers who want unique flavors as well as health benefits.



Visually, the striking color of the red dragon fruit skin gives it a distinct advantage. This color is not only aesthetically appealing, but also gives a natural impression that is in line with modern consumer preferences for foods that do not contain artificial colors. This combination of utilization, health benefits, and uniqueness makes Red Dragon Fruit Peel Cream Soup a great opportunity to be accepted in the market, both locally and globally, especially among communities who care about health and the environment. For the sustainability of this product in the real world, a good marketing approach is essential. Involving consumers in education about the benefits of red dragon fruit skin and environmentally friendly processing can increase appreciation for the product. Red Dragon Fruit Peel Cream Soup also has the potential to be developed further, for example as a ready-to-eat instant product, which makes it easier for consumers to enjoy it in various situations. With the right adjustments and marketing strategies, this product can become an icon of local-based food utilization that supports modern and sustainable lifestyles.

CONCLUSION AND IMPLICATION

Red Dragon Fruit Skin Cream Soup is a product utilization that successfully utilizes red dragon fruit skin as the main ingredient. This product not only offers a unique taste, but also contains health benefits because it is rich in fiber and antioxidants. From the results of the hedonic quality test and hedonic test, this product was well received by respondents, especially in the aspects of taste, texture, aroma, and color, with most respondents giving an assessment of "Like" to "Very Like". The natural color of the product is a visual attraction, while the consistent aroma provides a pleasant eating experience. Nonetheless, there are some weaknesses that need to be noted, such as taste and texture preferences that still vary among respondents. In addition, as a new product, efforts are still needed to increase consumer awareness and build trust in the benefits and uniqueness of this product.

From the results of the study, it was concluded that red dragon fruit skin can be used as cream soup. Based on the research conducted, the use of red dragon fruit skin as the main ingredient of cream soup showed good results. Red dragon fruit skin is rich in fiber and antioxidants, so in addition to utilizing food waste, this product also provides high nutritional value. The overall assessment of taste, texture, aroma, and color aspects showed positive acceptance by panelists. From the results of the hedonic quality test and hedonic test, the level of public liking for red dragon fruit skin cream soup is quite high. Based on the results of the hedonic quality test phase II, the red dragon fruit skin cream soup product showed advantages in texture, taste, and color, with a high average score reflecting consumer satisfaction. However, the aroma of the product was the main weakness, with the lowest score and variation in perception among panelists. A great opportunity opens up through the trend of consumers being increasingly interested in healthy and natural foods, making this product attractive to the market. However, the threat of intense competition in the healthy food market as well as challenges related to product stability at room temperature and the use of innovative ingredients such as red dragon fruit skin, require a strong differentiation strategy to remain competitive.

The continuation of this research can be done by deepening the study of the composition of raw materials, especially in terms of how the processing of red dragon fruit skin can affect the



quality of taste, texture, aroma, and color of the final product. In addition, a larger quality test involving more respondents can be conducted to obtain more precise data and increase the validity of the results. Further research can also explore product utilization such as developing other flavor variants or adding other natural ingredients to improve nutritional value and taste. To support product sustainability, research on more environmentally friendly and innovative packaging aspects could also be considered. Long-term testing related to consumer preference and market acceptance also needs to be conducted to ensure that this product can develop and compete in a wider market.

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