



The Effect of Using Pandan Extract (*Pandanus amaryllifolius*) As a Natural Colorant on The Organoleptic Properties of Mocaf-Based Cookies

Fatin Nur Azimah¹, Miftachul Chusnah²

¹Student of Faculty of Agriculture, KH. A. Wahab Hasbullah University, Indonesia

²Lecturer of Faculty of Agriculture, KH. A. Wahab Hasbullah University, Indonesia

ABSTRACT: In this modern era, people's awareness of healthy lifestyles and consumption of natural products is increasing, encouraging the food industry to turn to natural ingredients. One innovation that is in high demand is the use of natural colorants as a substitute for synthetic colorants, including in bakery products such as cookies. Pandanus juice (*Pandanus amaryllifolius*) is a promising natural colorant; it not only provides a natural green color but also has health benefits such as antioxidant and anti-inflammatory properties. This study aims to evaluate the effect of pandan juice on the organoleptic properties of cookies based on mocaf (*Modified Cassava Flour*). The study used a Complete Randomized Design (CRD) with three variations of pandan juice concentration, namely 5 ml, 10 ml, and 15 ml. Organoleptic tests were conducted to assess the characteristics of color, aroma, taste, and texture using a hedonic scale. Data obtained were analyzed using ANOVA to identify significant effects between treatments, followed by the BNT test at the 5% significance level if a significant difference was found. The results showed that the treatment with a concentration of 10 ml pandan juice (Treatment Y) provided the best organoleptic quality. At this concentration, mocaf-based cookies had an attractive green color, fresh pandan aroma, and the most preferred taste by the panelists. Treatment Y is considered optimal because it provides the best balance between aesthetics and flavor. This research provides valuable information for the food industry in its efforts to create healthier and higher-quality products through the use of natural colorants.

KEYWORDS: Cookies, Mocaf, Natural coloring, Organoleptic, Pandan Juice.

INTRODUCTION

In recent decades, there has been an increase in public awareness of the importance of a healthy lifestyle, especially in terms of consuming natural and environmentally friendly food products. This phenomenon has encouraged the food industry to innovate by using natural ingredients as a substitute for synthetic ingredients, including in the use of food coloring. The use of synthetic dyes in food and beverages presents positive impacts for both producers and consumers. Among these are enhancing the visual appeal of food, evening out the color, and restoring the original color lost during processing. However, alongside these benefits, the use of synthetic dyes can also lead to undesirable outcomes, potentially posing negative health effects on consumers (Parsih, 2022). Therefore, the use of natural dyes is a safer and healthier solution for consumers.

Cookie products are one type of food that is widely favored by the wider community. However, this product often uses synthetic dyes to improve its visual aesthetics. In line with the increasing demand for healthier food, there is a need to replace synthetic dyes with natural dyes. One of the natural ingredients that has the potential to be used as a dye is pandan (*Pandanus amaryllifolius*). In addition to providing a natural green color, pandan also has a distinctive aroma that can improve the organoleptic quality of food products. In addition, pandan is known to have antioxidant and anti-inflammatory properties that provide added value in terms of health (Silalahi 2018).

Previous scientific studies have shown that the use of natural dyes in food products not only improves the visual aspect, but also increases consumer perceptions of the safety and quality of the product (Andriani 2018). Mocaf (*Modified Cassava Flour*) is one of the innovations in the food industry that offers an alternative to wheat flour. Mocaf has similar characteristics to wheat flour but is healthier, because it is gluten-free and has a lower glycemic index (Zaidiyah, et al., 2023). The combination of using mocaf as a base ingredient for cookies and pandan extract as a natural dye is believed to produce products that are not only aesthetically attractive, but also healthy and environmentally friendly.



The novelty of this study lies in the study of the effect of pandan extract as a natural dye on the organoleptic properties of mocaf-based cookies. Although there have been quite a lot of studies on the use of natural dyes, studies that specifically examine the effect of pandan extract on the organoleptic characteristics of cookie products are still limited. Therefore, this study aims to provide a deeper scientific contribution to the topic, with the hope of providing useful input for the food industry and society (Bachtiar 2023).

The purpose of this study was to analyze the effect of the use of pandan extract as a natural dye on the organoleptic properties of mocaf-based cookies, including aspects of color, aroma, taste, texture, and overall consumer acceptance.

MATERIALS AND METHODS

Materials

The materials used in this study are mocaf flour, vegetable oil, sugar, eggs, vanilla, natural pandan juice coloring, baking powder, and a little sprinkle to decorate cookies. Mocaf and flour will give a distinctive texture to cookies, while natural pandan juice coloring will give a natural green color. Sugar will give a sweet taste to cookies, while eggs play a role in binding all the ingredients together and providing structure to cookies. With this combination of ingredients, it is used to make delicious mocaf cookies with a touch of natural green color from pandan juice.

Tools

The tools used in this study were a brownie pan, a large bowl or basin, a mixer or whisk, a knife, an oven or steamer and stove, baking paper or baking sheet, a digital scale, and an 80 mesh sieve.

Methods

Step 1

This study used a Completely Randomized Design (CRD) method with three treatments, each varying the amount of pandan juice added: X (5 ml), Y (10 ml), and Z (15 ml), with each treatment repeated three times. The selection of this method was carried out to ensure representative results and allow for accurate comparative analysis of the effect of pandan juice substitution on mocaf-based cookies. The RAL method is expected to provide a systematic and reliable framework in testing the hypothesis of this study.

Step 2

Method of Analysis Used: Data analysis in this study used a descriptive statistical approach to describe in detail the organoleptic characteristics of cookies, including color, aroma, and taste. Furthermore, the analysis of variance (ANOVA) test was used to identify the substantial effect of pandan extract substitution on the organoleptic quality of the cookies. To confirm the significant difference between treatments, further testing was carried out with the Least Significant Difference (LSD) test at a significance level of 5%. This approach was chosen to ensure proper analysis and reliable results in evaluating the effect of pandan extract substitution on mocaf-based cookies (Alamsyah 2016).

RESULTS AND DISCUSSION

In this study, three treatments of cookies using pandan extract were tested to determine the best treatment based on the organoleptic category. Treatment Y, which used a pandan extract concentration of 10 ml and was baked at 50°C for 1 hour, showed the highest organoleptic quality. The average scores obtained from the organoleptic test were 3.00 for color, 3.80 for aroma, and 4.27 for taste. These findings are summarized in Table 1 and illustrated in Figure 1.

Table 1. Results of organoleptic testing of pandan essence dry cakes

Treatment	Average Organoleptic Test		
	Color	Aroma	Taste
X	1,93	3,67	3,87
Y	3,00	3,80	4,27
Z	4,47	3,33	4,07

Source: Processed data (2024)

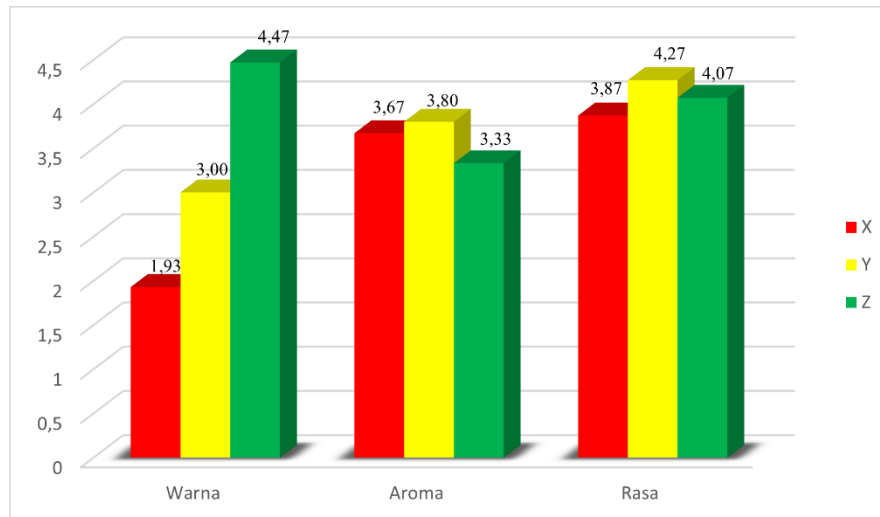


Figure 1. Chart
Average Value of Organoleptic Test of Pandan Sari Dry Cake.

Color, aroma, and taste are crucial elements in assessing the quality and attractiveness of food products. The results showed that cookies using pandan extract had attractive color variations, with treatment Y producing the color most preferred by panelists. However, non-enzymatic reactions that occur during the baking process can potentially reduce color brightness, which needs to be considered in further product development.

In terms of aroma, treatments X and Y produced a more delicious aroma, while treatment Z showed a rancid aroma due to the higher concentration of pandan extract. This indicates that the addition of pandan extract must be considered in the right amount to achieve the desired aroma balance.

The taste of cookies was the main factor in consumer preference, with an average score reaching 4.2. Treatments Y and Z were rated "very good," while treatment X was rated "not good." This emphasizes the importance of adding pandan extract in improving the taste of cookies.

Treatment Y was identified as the best treatment, producing cookies with attractive colors, delicious aromas, and delicious tastes. These findings confirm the effectiveness of pandan extract as a natural ingredient in improving product quality, as well as providing a pleasant sensory experience for consumers. This research provides an important contribution to the food industry in its efforts to produce healthier and higher quality products.

CONCLUSION

This study showed significant differences in the organoleptic quality of mocaf-based cookies with various proportions of pandan (*Pandanus amaryllifolius*) extract addition. The addition of pandan extract at a higher concentration (Treatment Z) resulted in a more intense green color, but Treatment Y was preferred because it provided a fresh and not too strong pandan aroma. In term of taste, Treatments Y and Z showed superior quality compared to Treatment X, with Treatment Y scoring the highest overall. The results showed that the proportion of 10 ml of pandan extract (Treatment Y) was the most optimal, achieving an ideal balance between color, aroma, and taste, and meeting consumer preferences, resulting in a visually appealing and satisfying product.

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