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RESEARCH ARTICLE

CONSUMER PREFERENCES AND WILLINGNESS TO PAY FOR PORANG-BASED ANALOG RICE

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ABSTRACT

Rice is a staple food for many people worldwide, especially in Asia, including Indonesians, with conventional white rice being the most commonly consumed type. However, conventional white rice has nutritional limitations and a high glycemic index, which can negatively impact health. This study explores consumer preferences and Willingness to Pay (WTP) for porang-based analogue rice as a healthier alternative. Using the Discrete Choice Experiment (DCE) method, data were collected from 150 respondents in Bogor, Indonesia, through voluntary response sampling. The results show that attributes such as porang rice type, softness, clear white colour, packaging, well-known brand, ease of preparation, longer shelf life, and health claims significantly influence consumer preferences. Consumers are willing to pay a higher price: IDR 46,040/kg for porang rice, IDR 58,600/kg for soft rice, IDR 43,338/kg for rice with a clear white colour, IDR 61,860/kg for packaged rice, IDR 61,389/kg for rice with a well-known brand, IDR 40,028/kg for rice that is easy to prepare, IDR 41,200/kg for rice with a longer shelf life, and IDR 90,401/kg for rice with health claims. These findings highlight the growing demand for healthier food options and provide valuable insights for producers and marketers to develop effective strategies. Emphasizing product quality and health benefits is crucial to increasing market acceptance of porang-based analogue rice.

INTRODUCTION

Rice is the staple food for most of the world's population, particularly in Indonesia. According to a report by the United States Department of Agriculture (Databoks, 2023), global rice production reached 507.4 million metric tons in 2022-2023. Meanwhile, global rice consumption reached 521.37 million metric tons during the same period, an increase of 2.7 million metric tons from the previous year, which recorded 518.6 million metric tons in 2021-2022. Indonesia ranks as the fourth-largest

global rice consumer, with consumption reaching 35.3 million metric tons over the past year. This consumption volume remains consistent with the previous periods.

As the world's fourth-largest rice-consuming country, Indonesian society generally consumes conventional white rice (Kabeakan & Putra, 2019). White rice grows in long, medium, and short grains. Before the milling process begins, husks, bran, and germs are removed from white rice, followed by the milling process. These processes give white rice a soft texture and a longer shelf life. However, this also causes white rice to lose a significant portion of its nutrients. Additionally, compared to other types of rice, white rice is known for its higher glycemic index, which can affect blood sugar levels, making it less healthy, especially when consumed in excess.

As time progresses, education levels and income among the population continue to rise. One of the effects of this is increasing public awareness regarding healthy and safe food consumption. People are starting to believe that their food contributes to their health. This is evidenced by changes in consumption patterns, where the tendency to consume foods high in fat, salt, carbohydrates, cholesterol, food additives, and low in fibre has shifted towards a preference for natural and healthy foods that prevent potential diseases (Winarno & Kartawidjajaputra, 2007). Currently, the primary trend in the food industry is moving towards the concept of "Healthy, Functional, and Satisfied Foods" in product development, including innovations in rice, such as healthy rice.

Healthy rice offers better nutritional benefits compared to ordinary white rice. Types of healthy rice include brown rice, red rice, black rice, and the latest innovation, porang-based analogue rice. Porang-based analogue rice is a food product designed to substitute regular rice. Porang, also known as Amorphophallus muelleri, is a tuberous plant widely grown in Indonesia (Rahayuningsih & Isminingsih, 2021). In recent years, porang-based analogue rice has become a trend, especially among health-conscious consumers. Porang contains a high level of glucomannan, at approximately 64.98%, facilitating moulding and providing good texture in analogue rice production (Ratnasari et al., 2013). In addition to its texture, glucomannan is known to lower cholesterol, stabilize blood pressure, and regulate blood sugar levels (Zhang et al., 2023). Glucomannan products are among the top ten healthy foods (Chua et al., 2010). Porang-based analogue rice can replace regular rice as the primary staple food, particularly for people with diabetes mellitus and obesity.

Porang-based analogue rice was first introduced in Indonesia in 2015. Since its initial market launch, sales of porang-based analogue rice have continued to grow annually. Currently, this product is available in offline and online stores under various brands in Indonesia, such as Fukumi, Shinsei, Konnyaku Grain, Hadiitaki, Kongbap, Mr. Ishii, and others. The price of porang-based rice tends to be higher than regular rice due to its complex production process. On the other hand, it remains unclear to what extent consumers prefer specific product attributes, such as the type of rice, texture, colour, packaging, brand, ease of preparation, shelf life, health claims, and their Willingness to Pay (WTP). Therefore, this study examines consumer preferences and willingness to pay for porang-based analogue rice.

Understanding consumer preferences for product attributes and willingness to pay (WTP) is crucial for producers and marketers of porang-based analogue rice to develop effective strategies targeting the right products and consumers. Consumer

preference measurement for porang rice uses the Discrete Choice Experiment (DCE), a widely used method for studying consumer preferences for specific attribute combinations (Kessels et al., 2011). According to Train (2014), the DCE method is the most effective approach for accurately measuring consumer preferences compared to other methods. Additionally, this method can determine the maximum amount consumers are willing to pay (WTP) for a product (Louviere et al., 2010).

The selection of this analytical tool is based on previous research experiences (Simamora, 2004), as seen in studies by Louviere et al. (2010), Nurdin et al. (2017), Ceschi et al. (2018), Greene et al. (2018), and Lestari & Siadah (2023), which demonstrate that the use of the Discrete Choice Experiment (DCE) method for analyzing consumer preferences and WTP is highly effective and efficient. On the other hand, the application of this method remains relatively rare in research on consumer preferences and WTP. Therefore, this study employs the DCE method to assess further its effectiveness and efficiency in analyzing consumer preferences and WTP while contributing to the novelty of this research.

Understanding consumer behaviour enables producers and marketers to influence purchasing decisions, ensuring consumers are willing to buy the products offered (Probowati et al., 2016). Consumers evaluate porang-based analogue rice based on its attributes, even though sellers often lean towards selling other healthy rice types rather than porang-based analogue rice. This is influenced by consumer satisfaction and preferences regarding the attributes of porang-based analogue rice, which determine its acceptance among consumers (Nurdin et al., 2017). Based on these issues, research on consumer preferences and willingness to pay for porang-based analogue rice is needed.

RESEARCH METHOD

The selected location for this research is Bogor, where the study was conducted in September 2024. The location was chosen deliberately (purposive sampling) based on specific factors aligned with the research objectives. The research was carried out in Bogor Regency and Bogor City, considering that Bogor is a strategically important economic area with a heterogeneous population dominated by people from various social and educational backgrounds. Bogor also has a high level of economic activity and is an urban area within the Jabodetabek region. Moreover, it is among the regions in Indonesia with the highest minimum wages in the country and West Java. Minimum wage considerations are crucial since the high price of porang-based analogue rice necessitates considering income levels. Thus, Bogor provides a relevant context for observing consumer behaviour concerning preferences and willingness to pay (WTP) for porang-based analogue rice.

The data used in this study are primary data collected through offline surveys with respondents using questionnaires and online surveys using Google Forms. Respondents were recruited through a non-probability voluntary sampling method, where participants voluntarily agreed to provide the necessary data. The minimum sample size was determined using using the Discrete Choice Experiment (DCE) method based on the Orme (2010) equation:

$$n \geq \frac{500c}{t \times a}$$

Note:

n: Total sample size; t: Number of choice sets; a: Number of product profiles per choice set; c: Maximum number of levels for an attribute

The sample size was adjusted to fit the construction of the choice set, which consisted of 16 choice sets, two profiles per choice set, and a maximum of 3 levels for attributes. The 16 choice sets were generated from an orthogonal design using the SPSS analysis tool, obtained by maximizing the determinant of the information matrix introduced by Street et al. (2005). In addition, one profile was generated from this orthogonal design. However, in this study, two profiles per choice set were used, with the second profile obtained through manual calculations using the matrix generator. Meanwhile, for the maximum of 3 levels for the attributes, this was determined by identifying which attribute had the most levels. This study found this in the price attribute, which consists of three levels. Therefore, the minimum sample size required for this study was calculated as follows:

$$n \geq \frac{500(3)}{16 \times 2}$$
$$n \geq 46.875 \approx n = 47$$

Thus, the minimum sample size for this research is 47 respondents. The selected respondents had purchased and consumed porang-based analogue rice and were 17 years old. Respondents aged 17 years or older were considered capable of evaluating the attributes of porang-based analogue rice and making informed choices.

Additionally, selecting representative areas in Bogor for the sample was conducted purposively. The chosen areas included Bogor Tengah, Tanah Sareal, Cibinong, Babakan Madang, and Dramaga, based on their significant market concentration, shopping centres, and other economic activities. Each of these areas represented an equal number of respondents, with 30 respondents per area, achieving the targeted sample size of 150 respondents,

The analysis consisted of two parts: qualitative descriptive analysis: This analysis provides a general overview of consumer characteristics, such as demographics, preferences, behaviours, and habits when choosing products. This analysis aims to explore more profound insights into the factors that influence consumer purchasing decisions without using detailed numbers or statistical data. Quantitative analysis: This analysis identifies consumer preferences and willingness to pay for porang-based analogue rice attributes, which are evaluated based on consumer characteristics using the DCE analytical tool. The DCE method explores preferences by creating various combinations of attributes related to porang-based analogue rice.

Based on a literature review, specifically in the studies by Cabral et al. (2024), Sakolwitayanon et al. (2018), Ogundele (2014), Fang et al. (2023), Bunyasiri & Sirisupluxana (2018), Adabrah-Danquah (2023), Widayanti et al. (2020), Bhattacharya (2011), Ceschi et al. (2018), the attributes considered in this study include rice type,

softness, whiteness degree, packaging, brand, ease of preparation, cooked rice shelf life, health claims, and price. The attributes and their levels are as follows:

  a. Rice type   : Porang-based rice and conventional rice (2 levels)
  b. Softness   : Soft and not soft (2 levels)
  c. Whiteness degree: Clear white and milky white (2 levels)
  d. Packaging : Packaged and bulk (2 levels)
  e. Brand   : Well-known and not well-known (2 levels)
  f. Ease of preparation   : Easy to prepare and not easy to prepare (2 levels)
  g. Cooked rice shelf life   : Long and not long (2 levels)
  h. Health claims   : Healthy and no health claims (2 levels)
  i. Price   : IDR 15,152/kg, IDR 163,087/kg, and IDR 179,000/kg (3 levels)

The attribute combinations in the choice set were systematically designed using the orthogonal design method to ensure data representation while considering the number of attributes and levels. The total number of attribute-level combinations was calculated as 2x2x2x2x2x2x2x2×3=7682. The study employed 16 choice sets and created two product profiles for each choice set using an orthogonal design (SPSS).

A Discrete Choice Experiment (DCE) employs a logistic regression model to assess the utility value associated with each attribute. The foundational idea behind DCE is Random Utility Theory (RUT). According to RUT, consumers have preferences when selecting product profiles in a choice set and will choose the one they prefer most. RUT assumes that latent utility consists of two components: a systematic explainable component (V_{ij}) and an unexplained random component (ε_{ij}) (Louviere et al., 2010). In equation form, the RUT is represented as follows:

$$U_{ij} = V_{ij} + \varepsilon_{ij}$$

Note:
U_{ij} : Latent utility of the i-th individual towards the j-th alternative; V_{ij} : Systematic component of the i-th individual's utility of alternative; $k\varepsilon_{ij}$: Random component of the utility for the i-th individual against the j-th alternative

Then, in the general form of DCE, the component εij is uncorrelated with consumer choice, so the utility of choosing the jth product profile in the i-th choice set (U_{ij}) can be explained by Vij, the product profile (product attribute level). If V_{ij} is a linear combination of attribute levels X_{ij}, then:

$$U_{ij} = x'_{ij}\beta + \varepsilon_{ij}$$

However, if U_{ij} is nominal, then the profile of the jth product in the i-th choice set can be expressed as a conditional logit (McFadden, 1974):

$$P_{ij} = \frac{\exp\left(x'_{ij}\beta\right)}{\sum_{ij}\exp\left(x'_{ij}\beta\right)}$$

Note:
P_{ij} : the probability of a consumer choosing the jth product profile in the i-th choice set; x_{ij} : level vector of the i-th profile attribute in the i-th choice set; β : model coefficient

In the RUT framework, utility is viewed as a random variable that can be separated into distinct utilities based on product features or characteristics. Specifically, Vij has been substituted with various variables representing the chosen attributes to formulate the random utility model. Below is the model for attribute design:

$$U_{ij} = \beta_{ricetype} + \beta_{softness} + \beta_{whitenessdegree} + \beta_{packanging} + \beta_{brand}$$
$$+ \beta_{preparationeasyness} + \beta_{cookedshelflife} + \beta_{healthclaim} + \beta_{price} + \varepsilon_{ij}$$

The model coefficient β represents the utility measurement of an attribute. Furthermore, the coefficient value can determine the consumer's Willingness to Pay (WTP). WTP refers to the maximum amount a consumer is willing to pay to acquire a product or service. This concept is widely used in economic analysis to assess the value consumers place on a product, including innovative products such as analogue rice made from porang. WTP can be influenced by various factors, including consumer income, preferences, product benefits, and awareness of health and environmental aspects.

Commonly used methods to measure WTP include the Contingent Valuation Method (CVM) and Choice Experiment (CE), which aim to estimate the optimal price based on consumer perception and willingness to purchase. The WTP value is calculated by dividing the attribute coefficient by the price coefficient, as noted by (Greene et al., 2018):

$$WTP_{attribute-j} = \frac{\beta_{attribute-j}}{\left|\beta_{price}\right|}$$

Where $\beta_{Attribute}$ represents the coefficient or utility value of the attribute level for profile j, such as attributes for rice type, softness, whiteness degree, packaging, brand, ease of preparation, cooked rice shelf life, and health claims, meanwhile, β_{Price} represents the coefficient value related to price. After the analysis, whether consumers tend to pay a higher price for porang-based analogue rice will become clear.

RESULT AND DISCUSSION

Respondents Charateristics

The respondents in this study were involved in the decision-making process related to the purchase and final consumption of porang-based analogue rice. All respondents were over 17 years old and had purchased and consumed analogue rice from porang. Additionally, the respondents in this study had a monthly income categorized as middle class (minimum IDR 4,000,000). One hundred fifty respondents participated in this study, selected from 337 individuals surveyed through direct interviews and online questionnaires using Google Forms.

The percentage of the gender variable based on the research data shows that female consumers, accounting for 52.7%, purchase and consume porang-based analogue rice more than male consumers, who account for 47.3%. This finding aligns with the research conducted by (Yasa & Ekawati, 2015), which found that women

dominate product purchasing decisions compared to men. Health-focused products also tend to be purchased more frequently by female consumers (Beardsworth et al., 2002).

The research results show a diverse age range among consumers who purchase and consume porang-based analogue rice, necessitating age classification to facilitate data analysis. The age classification in this study refers to the (Departemen Kesehatan RI, 2009), which categorizes late adolescence as 17–25 years, early adulthood as 26–35 years, late adulthood as 36–45 years, early elderly as 46–55 years, and late elderly as 56–65 years. However, this study only includes respondents up to the early elderly category (46–55 years) as the maximum age of respondents falls within this range.

The data reveals that porang-based analogue rice is primarily purchased and consumed by individuals in the early adulthood group (54%). In this age range, respondents are more aware of the importance of consuming health-beneficial foods and are more willing to purchase porang-based analogue rice. Taste preferences are also influenced by age differences (Prabu, 2001). Additionally, respondents aged 26–35 years are part of a productive age group that tends to fulfil their needs independently (Butt & Beiser, 1987).

Porang-based analogue rice respondents in this study are generally well-educated consumers, with the majority (56.7%) holding a bachelor's degree. Regarding occupation, most respondents were entrepreneurs (44.7%). A person's occupation can influence their consumption patterns. Monthly personal income also determines respondents' purchasing power for the offered products. One of the factors influencing consumers' purchasing decisions is their economic condition based on their disposable income (Chikweche & Fletcher, 2010). Most respondents have an average monthly income of IDR 4,000,000 < Y ≤ IDR 5,750,000 (44%). These data suggest that consumers purchasing and consuming porang-based analogue rice are predominantly middle-income and well-educated.

Table 1.   General Characteristics of Respondents

Characteristics	Total (n=150)	Percentage (%)
Gender		
Male	71	47.3
Female	79	52.7
Age (years)		
17-25	10	6.7
26-35	81	54.0
36-45	58	38.7
46-55	1	0.7
Last Education		
High School	37	24.7
Diploma (D3)	25	16.7
Bachelor's Degree (S1)	85	56.7
Master's Degree (S2)	3	2.0
Occupation		
Student	2	1.3
Housewife	11	7.3
Entrepreneur	67	44.7
Civil Servant	31	20.7
Private Employee	37	24.7
State-Owned Enterprise Employee	1	0.7
Laborer	1	0.7
Income (per month)		
IDR 4,000,000 < Y ≤ IDR 5,750,000	66	44.0
IDR 5,750,000 < Y ≤ IDR 7,250,000	51	34.0
IDR 7,250,000 < Y ≤ IDR 9,000,000	21	14.0
IDR 9,000,000 < Y ≤ IDR 10,750,000	6	4.0
> IDR 10,750,000	6	4.0

Consumer Preferences for Porang-Based Analog Rice

An analysis of consumer preferences for porang-based analogue rice was conducted to understand consumer desires, enabling improvements in product quality and market presence in the domestic rice sector. The analysis employed the Discrete Choice Experiment (DCE) method, wherein the attributes of porang-based analogue rice were combined into two choices across 16 questions for respondents to answer. The collected responses were analyzed using STATA software (Kohler & Kreute, 2005). Table 2 presents the results of the estimation of the consumer behavior model towards porang-based analogue rice.

Based on the conditional logistic regression estimation model shown in Table 2, all the attributes included in this study were found to have a significant influence. Porang-based rice demonstrated a positive and higher utility value than

conventional rice, with a coefficient of 0.1496254. This indicates that consumers are shifting toward food products that offer health benefits, increasing their health awareness. These findings are consistent with studies by Cabral et al. (2024), Sakolwitayanon et al. (2018) and Ogundele (2014), which state that rice type significantly affects consumer preferences, especially for rice that provides better health benefits.

Rice with a soft texture had a positive and higher utility value than non-soft rice, with a coefficient of 0.1904512. This demonstrates that consumers prefer softer rice. These findings also align with studies by (Fang et al., 2023) and (Bunyasiri & Sirisupluxana, 2018), which found that consumers prefer soft-textured rice over non-soft varieties.

Clear white rice showed a positive and higher utility value compared to milky white rice, with a coefficient of 0.1408486. This indicates that consumers prefer clear white rice over milky white rice. This finding is consistent with Adabrah-Danquah (2023), who stated that consumers prefer clear white rice as it is perceived as cleaner, a characteristic observable during the washing process. However, these results differ from Gunawan & Melinda (2021), who found that respondents preferred milky white rice, as many believed it indicated better quality than clear white rice.

Packaged rice had a positive and higher utility value compared to bulk rice, with a coefficient of 0.2010434. This indicates that consumers prefer packaged rice over rice sold in bulk. This finding aligns with Widayanti et al. (2020), who found that packaged rice is generally more preferred by consumers. However, it contrasts with Lestari & Saidah (2023), who found that respondents preferred bulk rice, as it allows purchases in specific quantities (liter or kilograms) tailored to individual needs.

Rice from well-known brands had a positive and higher utility value than rice from lesser-known brands, with a coefficient of 0.1995129. This demonstrates that consumers prefer products from well-known brands over lesser-known ones. These findings align with studies by Fang et al. (2023), Bunyasiri & Sirisupluxana (2018), and Cabral et al. (2024), which state that consumers tend to choose products from reputable brands because they feel safer and more assured.

Rice that is easy to prepare had a positive and higher utility value than rice that is difficult to prepare, with a coefficient of 0.1300919. As supported by Bhattacharya (2011), consumers prefer ease of preparation, who found that practicality and convenience are significant factors in consumer preferences for rice products.

Rice with a longer cooked shelf life showed a positive and higher utility value compared to rice with a shorter shelf life, with a coefficient of 0.1339011. This indicates that consumers prefer rice with a longer cooked shelf life. Researchers found that different rice types and even brands have varying shelf lives for cooked rice. Thus, this attribute becomes essential for producers aiming to create products with an extended cooked shelf life.

Rice with health claims (healthy rice) had the highest positive and higher utility value, with a coefficient of 0.2938031, compared to rice without health claims. Consumers prefer rice with health benefits, as supported by Yang et al. (2021), who found that consumers favor products offering health advantages. The presence or absence of health claims significantly influences consumer choices.

Table 2   Consumer Utility Values for Porang-Based Analog Rice Attributes

Attribute	Attribute Level	Coef β	P Value
Type of Rice	Porang-based Rice Conventional Rice	0.1496254	0.009***
Softness	Soft Not Soft	0.1904512	0.001***
Whiteness	Clear White Milky White	0.1408486	0.015**
Packaging	Packaged Bulk	0.2010434	0.000***
Brand	Well-Known Not Well-Known	0.1995129	0.001***
Ease of Preparation	Easy to Prepare Not Easy to Prepare	0.1300919	0.025**
Cooked Rice Shelf Life	Long Not Long	0.1339011	0.021**
Health Claims	Healthy No Health Claims	0.2938031	0.000***
Price per kg	IDR 15,152 IDR 163,087 IDR 179,000	-0.00000325	0.000***

According to Tjiptono (1995), price plays two leading roles in purchase intention: allocation and information. The allocation role helps consumers manage their spending to maximize utility. In this study, the price utility value was negative (-0.00000325), indicating that price increases negatively impact consumer utility. This is consistent with findings by Ceschi et al. (2018), which also identified a negative relationship between price and utility.

Willingness to Pay for Porang-Based Analog Rice Consumers

Price is a factor that influences the quantity of demand, depending on the type of essential goods. Individuals consume goods based on the utility or benefits they derive from these goods and services. Consumers are willing to spend money to gain satisfaction, benefits, and utility from goods and services, directly or indirectly, despite income limitations that require them to select products according to their financial capabilities (Ambler, 1997).

Consumers generally pay more if the product quality meets their needs. Consumer awareness of paying a premium for quality attributes of porang-based analogue rice is driven by their preferences, which evaluate the rice based on the benefits they need. In calculating willingness to pay (WTP), the utility value for each attribute is divided by the price utility. Table 3 shows the extent to which consumers are willing to pay for porang-based analogue rice with attributes they prefer.

Based on the WTP results, consumers are willing to pay a premium for porang-based analogue rice with the following attributes: porang-based rice type, soft texture, clear white colour, packaged, well-known brand, easy preparation, long-cooked shelf life, and health claims (healthy rice). Consumers will pay IDR 46,040/kg

more for porang-based rice than conventional rice. They are also willing to pay IDR 58,600/kg more for soft-textured rice than non-soft rice.

Table 3   Willingness to Pay for Each Attribute of Porang-Based Analog Rice

Attribute	Attribute Level	WTP (IDR/kg)
Type of Rice	Porang-based Rice	46,040
	Conventional Rice	
Softness	Soft	58,600
	Not Soft	
Whiteness	Clear White	43,338
	Milky White	
Packaging	Packaged	61,860
	Bulk	
Brand	Well-Known	61,389
	Not Well-Known	
Ease of Preparation	Easy to Prepare	40,028
	Not Easy to Prepare	
Cooked Rice Shelf Life	Long	41,200
	Not Long	
Health Claims	Healthy	90,401
	No Health Claims	

Consumers are willing to pay IDR 43,338/kg more for clear white rice than for milky white rice. For packaged rice, they are willing to pay IDR 61,860/kg more compared to bulk rice. Additionally, consumers are willing to pay IDR 61,389/kg more for rice from well-known brands than rice from lesser-known brands. Rice that is easy to prepare commands a premium of IDR 40,028/kg compared to rice that is not easy to prepare.

Consumers are also willing to pay IDR 41,200/kg more for rice with a longer cooked shelf life than rice with a shorter cooked shelf life. Lastly, rice with health claims (healthy rice) attracts the highest additional willingness to pay, at IDR 90,401/kg more than rice without health claims.

CONCLUSION

This study found that consumers of porang-based analogue rice prefer porang-based rice, soft, clear white, packaged, from a well-known brand, easy to prepare, has a long-cooked shelf life, and contains health claims (healthy rice) at a lower price. Consumers are willing to pay a higher price for porang-based rice, specifically IDR 46,040/kg for porang rice compared to conventional rice. They are willing to pay IDR 58,600/kg more for soft rice compared to non-soft rice, IDR 43,338/kg more for rice with clear white colour compared to milky white rice, IDR 61,860/kg more for packaged rice compared to bulk rice, IDR 61,389/kg more for rice from a well-known brand compared to lesser-known brands, IDR 40,028/kg more for easy-to-prepare rice compared to rice that is not easy to prepare, IDR 41,200/kg more for rice with a longer cooked shelf life compared to rice with a shorter shelf life, and IDR 90,401/kg more for rice with health claims (healthy rice) compared to rice without health claims. On the other hand, consumers are not willing to pay more for conventional rice, non-soft rice, milky white rice, bulk rice, rice from lesser-known

brands, rice that is di, and prototypes. Sufficient research data must support conclusions.

The results of this study indicate that health claims are an essential attribute for producers. Therefore, producers must ensure their porang-based analogue rice products contain accurate, reliable, and trustworthy health claims. Health claims can add value to the product and assure consumers that the rice they consume offers genuine health benefits. Additionally, producers are advised to provide porang-based analogue rice with a soft texture, clear white colour, packaging, well-known brands, ease of preparation, and a long-cooked shelf life.

For marketers, efforts to improve the performance of porang-based analogue rice can be made by highlighting the product's advantages and quality through various print and digital promotional media. Such promotions are crucial to raising consumer awareness of the benefits of porang-based analogue rice, especially among the health-conscious market segment. Furthermore, marketers must emphasize the product's economic value by communicating competitive pricing without compromising quality.

Farmers and porang cultivators should develop strategies to supply high-quality porang to capture a larger export market share and strengthen supply chain collaborations to ensure price stability and availability. This also requires support from the government through training local farmers in high-quality porang cultivation techniques to ensure a sustainable supply of raw materials. Moreover, the government should support the development of agricultural and logistical infrastructure to support the supply chain of porang-based analogue rice from farmers to consumers.

AUTHOR CONTRIBUTION STATEMENT

[Author 1]: research designed, data collection, the initial manuscript draft, funding acquisition; [Author 2]: research supervision, analytical guidance, edited the manuscript; [Author 3]: research conceptualization, data analysis, addressed reviewer's comments. All authors reviewed and approved the final version of the article.

DECLARATION OF COMPETING INTEREST

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper. This declaration is made in the interest of full transparency and to uphold the highest standards of academic integrity.

ETHIC STATEMENT

Ethical review and approval were waived for this study as it did not involve any intervention and posed minimal risk to participants. Nevertheless, informed consent was obtained from all respondents prior to participation, and all data were anonymized and kept confidential.

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