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Abstract

Gudril crackers are a local food product of Cimindi Tourism Village, Pangandaran Regency, produced by the MSME Good Real Pasundan. These crackers are made from cassava using a unique manufacturing process that involves smoothing, pressing, steaming, cutting, and drying without the use of flour. This study aimed to analyze consumer preference for gudril crackers through hedonic testing. A hedonic test was conducted with 35 panelists using a 7-point likert scale (1=strongly dislike to 7=strongly like) to assess attributes such as color, aroma, taste, texture (crispness), and overall liking. The result showed that the original gudril crackers and a variant with added mackerel had the highest average score (6.0) across all attributes, indicating a strong positive response from panelists. However, some areas for improvement were identified, particularly in the mackerel variant, where the savory taste, aroma, and texture could be optimized. In general, the aroma of gudril crackers has potential for enhancement. This study provides valuable information for Good Real Pasundan to further develop gudril cracker products that are more appealing to consumers and have the potential for wider market distribution.

Keywords: Consumer Acceptance, Gudril Crackers, Hedonic Tests, SMEs

1. Introduction

Micro and Small Enterprises (MSEs) are integral to the Indonesia economy, exhibiting resilience during times of crisis due to their focus on local production and consumption. Unlike larger businesses, MSEs typically rely on locally sourced raw materials and utilize minimal capital, facilitating community-based management and reducing dependence on imports. Furthermore, according to data from the Ministry of Cooperatives and Small and Medium Enterprises, micro-enterprises dominated the Indonesian business landscape in 2019, accounting for 64,60 million business units, or 98,68% of the total number of MSEs. This highlights the significant contribution of micro enterprises to the nation's economic activity and underscores the importance of supporting their growth and development.

MSEs are a driving force within the economy of West Java, Indonesia. According to data Statistics Indonesia (BPS) of West Java, the number of MSEs reaches more than 4.5 million business units, representing 98,84% of total non-agricultural businesses. Consequently, MSEs have become a crucial pillar of the economy, supporting Indonesian communities amidst global competition and driving economic growth, particularly in West Java.

Table 1.

Presents data on the development of Micro, Small, and Medium Enterprises (MSMEs) and Large Enterprises (Les) in Indonesia from 2018 to 2019.

Indicator	Year		Development in 2018-2019 (%)
	2018 Amount (Unit)	2019 Amount (Unit)	
Micro Business	63,350,222	64,601,352	1.97
Small Business	783,132	798,679	1.99
Medium Business	60,702	65,465	7.85

Total MSME	64,194,056	65,465,496	1.98
Large Business	5,550	5,637	1.58

Sources: Kemenkopukm (2019)

The Indonesian economy relies heavily on the contributions of MSMEs, particularly within the food sector. They represent a significant proportion of employment and make a substantial contribution to the national Gross Domestic Product (GDP). Beyond their economic contributions, food-based MSMEs are essential for the preservation and promotion of Indonesia's diverse array of local food products. A notable example is the traditional crackers, known as "kerupuk".

A culinary icon of Indonesia, kerupuk (crackers) exhibit a wide range of unique variations and flavors across different regions (Beynon, et, al. 2018). In Cimindi Village, Pangandaran Regency, West Java, the MSME Good Real Pasundan produces a distinctive cracker known as kerupuk gudril. Unlike common crackers, kerupuk gudril is made from cassava that is processed through a unique method involving smoothing, pressing, steaming, thinly slicing and drying, all without the use of any flour.

Local food in Indonesia constitutes an integral component of the nation's culinary heritage, encompassing food products that have been developed, produced, and consumed by communities within specific regions for generations (Trisnoputri, Primakrisna. 2016). These foods have deep connections with local culture and traditions. The existence of kerupuk gudril not only enriches the diversity of Indonesian cuisine but also strengthens the local identity of Cimindi Village.

Despite its potential as a local food, kerupuk gudril remains relatively unknown and has limited market reach, necessitating product development and market expansion. One such effort involves product innovation, as demonstrated by the MSME Good Real Pasundan, which introduced a variant incorporating mackerel into the kerupuk gudril dough. This aims to create a unique flavor profile and enhance the nutritional value of the crackers, there by attracting a wider consumer base. To ensure market acceptance of kerupuk gudril, consumer acceptability analysis is essential. This can be achieved through hedonic testing to measure consumer preference for the product, assessing attributes such as taste, aroma, color, texture, and overall liking. Hedonic testing is a sensory evaluation method in which consumers rate their level of liking for similar products by providing scores or feedback (Qamariah, 2022).

The study aims to determine consumer acceptance of gudril crackers by analyzing preference levels through hedonic tests. This data is essential for identifying product attributes that are liked and disliked by consumers and wick sensory aspects need to be improved (Qamariah, 2022). The results of this study are expected to provide information on the marketing potential of mackerel gudril crackers and support the development of MSMEs Good Real Pasundan in introducing the product to a wider market.

2. Method

Hedonic rating tests effectively measure consumer acceptance of new or modified product (Maligan, 2018). This test was conducted to determine consumer preference levels for various attributes of kerupuk gudril, including color, aroma, taste, texture (crispiness), and overall liking. A panel of 35 individuals participated in the test, in accordance with the recommendations of the Indonesian National Standard SNI 01-2346-2006 (Badan Standar Nasional, 2006).

Panelist preference data was collected through hedonic testing using a 7-point Likert scale ranging from 1 (strongly dislike) to 7 (strongly like). As only one sample of each product was tested, we conducted a one-sample t-test using IBM SPSS Statistics 25 software to compare the

mean liking score against a predetermined test value. A test value of 6.0 was used, representing the minimum average panelist rating for a sample to be considered acceptable. A test value of 6.0 was established as the minimum score indicating panelists favorable inclination towards the product. A statistically significant difference (at a 95% confidence level) indicates a product score significantly below 6.0, suggesting overall disinclination. Conversely, the absence of such a difference implies a score equal to or greater than 6.0, signifying a favorable or neutral perception. The test value chosen for hedonic testing can influence product acceptance decisions; a lower test value may increase awareness of less familiar products (Lawless, 2010).

3. Results and Discussion

Mean Hedonic Scores for Gudril Crackers

Gudril crackers are a local product specific to Cimindi Tourism Village in Pangandaran Regency, made from cassava and currently with limited market recognition, being marketed only in the surrounding area. The MSME Good Real Pasundan produces three types of gudril crackers: original, with added mackerel meat, and with added mackerel bone. To assess consumer preferences for these relatively unknown products, a hedonic rating test was conducted. Figure 1 visualizes the mean hedonic scores for each cracker type, reflecting the panelists liking across various attributes.

Figure 1.

Mean Hedonic Scores

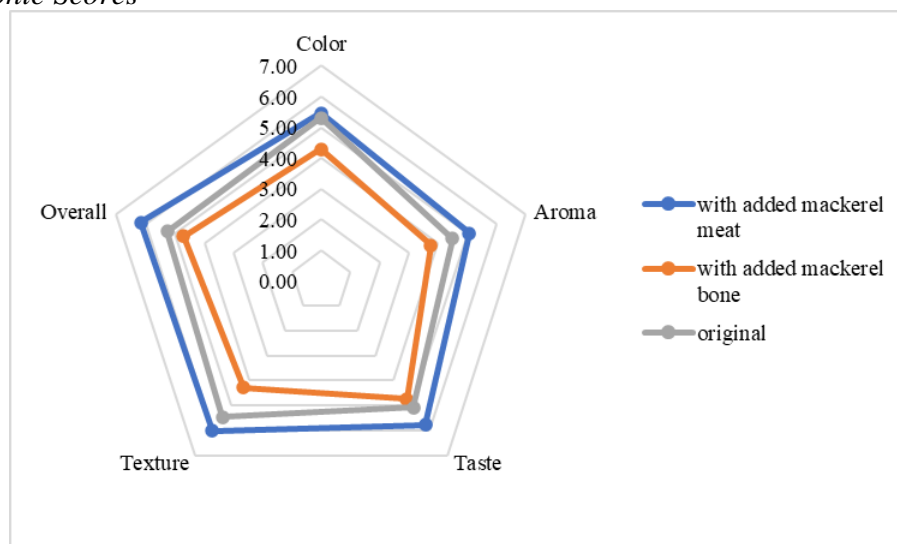


Figure 1 illustrates that both the original gudril crackers and the variant with added mackerel meat achieved the highest mean scores (6.0) across all attributes. This indicates that these two product variations elicited the most positive responses from the panelists, indicating strong market potential.

Color

Descriptive analysis of the hedonic rating test for color showed the following mean scores: 6.00 for the original, 5.09 for the mackerel meat variant, and 5.18 for the mackerel bone variant. Based on the one-sample t-test (test value = 6.0), the original gudril crackers showed no significant difference ($p > 0.05$) at a 95% significance level (Table 2). In contrast, the gudril crackers with added mackerel meat and bone showed significant differences ($p < 0.05$) at a 95% significance level (Table 3 and 4). The addition of mackerel meat and bone influenced panelist perception of the resulting cracker color, as the original gudril crackers tended to be preferred by the panelists based on the established test value of 6.0

Table 2.

One-sample t-test for The Original Gudril Crackers

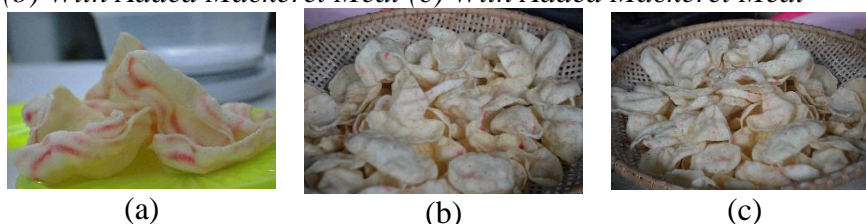
One-Sample Test
Test Value = 6.0

	t	df	Sig.(2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Color	.000	34	1.000	.000	-.32	-.32
Aroma	-6.751	34	.000	-1.200	-1.56	-.84
Taste	-2.927	34	.006	-.514	-.87	-.16
Texture	-1.244	34	.222	-.229	-.60	.14
Overall	.702	34	.487	-.114	-.45	.22

Color, as the first attribute perceived by sight, plays a crucial role in the sensory evaluation of food products, shaping the initial impression and significantly influencing appetite (Kilcast D. 2010). Furthermore, color can influence the overall acceptance of a product by consumers (Lawless, 2010). In this study, the final colors of the original gudril crackers and the mackerel added crackers were brownish-white and brownish-yellow, respectively (Figure 2).

Figure 2.

(a) Original (b) With Added Mackerel Meat (c) With Added Mackerel Meat



Aroma

Gudril crackers with the addition of mackerel exhibit a distinctive aroma imparted by the volatile compounds present in the fish, providing a unique sensory experience for the panelists, who then assess it based on their level of acceptance or preference for both the original and mackerel-added variants. Aroma, as a crucial sensory attribute, originates from volatile compounds released by the food and detected by olfactory receptors in the nasal cavity (Belitz, et. al 2009). During mastication, these aromatic compounds are further released within the mouth, enhancing aroma perception, which the nasal cavity then detects via the retronasal pathway (Lawless, 2010). Pleasant aromas generally indicate palatable food and enhance the appeal of the product to consumers (Kilcast D. 2010).

Table 3.

One-Sample T-Test for The Added Mackerel Meat Gudril Crackers

One-Sample Test
Test Value = 6.0

	t	df	Sig.(2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Color	-4.779	34	.000	-.857	-1.22	-.49
Aroma	-4.280	34	.000	-.714	-1.05	-.38
Taste	1.099	34	.280	.171	-.15	.49
Texture	1.139	34	.263	.171	-.13	.48
Overall	1.950	34	.059	.257	-.01	.53

Descriptive analysis of the hedonic rating test for aroma revealed the following mean scores: 4.82 for the original gudril crackers, 5.29 for the mackerel meat variant, and 4.91 for the mackerel bone variant. Based on the one-sample t-test results (test value = 6.0), all gudril cracker variants showed significant differences ($p < 0.05$) at a 95% significance level. These findings indicate a 'slightly liked' preference for the aroma across all gudril cracker variants. This moderate preference may reflect the limited familiarity with gudril crackers as a local product.

Taste

Descriptive analysis of the hedonic test for taste revealed varying levels of preference among panelists. The original gudril crackers received a mean score of 5.44, while the variant with added mackerel meat obtained the highest mean score of 6.18. The variant with added mackerel bone fell between these, with a mean score of 5.68. A one-sample t-test, with a test value of 6.0, revealed that only the gudril crackers with added mackerel meat showed no significant difference ($p > 0.05$) at a 95% significance level, indicating good acceptance by the panelists. Both the original gudril crackers and the variant with added mackerel bone showed significant differences ($p < 0.05$), suggesting that the addition of mackerel bone influenced taste perception. The addition of ingredients can modify the sensory profile of a product, including taste, and impact consumer acceptance (Lawless, 2010). Specifically, the addition of mackerel meat may positively contribute to the taste of gudril crackers, thereby increasing panelist preference.

Table 4.

One-Sample T-Test for The Added Mackerel Bone Gudril Crackers

	t	df	Sig.(2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Color	-5.504	34	.000	-.826	-1.13	-.52
Aroma	-5.354	34	.000	-1.114	-1.54	-.69
Taste	-2.325	34	.026	-.343	-.64	-.04
Texture	-3.118	34	.004	-.686	-1.13	-.24
Overall	-1.575	34	.124	-.286	-.65	.08

Texture (crispiness)

Hedonic testing for texture (crispiness) revealed varying levels of preference among panelists. The original gudril crackers received a mean score of 5.74, while the variant with added mackerel meat scored highest (mean = 6.15), and the variant with added mackerel bone scored lowest (mean = 5.35). A one-sample t-test, with a test value of 6.0, indicated that, at a 95% significance level, neither the original gudril crackers nor those with added mackerel meat showed a significant difference ($p > 0.05$). However, the variant with added mackerel bone differed significantly ($p < 0.05$). These results suggest that the addition of mackerel meat may enhance the perceived crispiness of the crackers, leading to a higher preference among panelists.

Overall

Overall liking, defined as the consumer's holistic preference for a product considering all its sensory attributes (Popper R, 2004), reflects consumer acceptance and ultimately influences purchasing decisions. This study evaluated overall liking to measure consumer acceptance of three gudril cracker variants: original, with added mackerel meat, and with added mackerel

bone. Descriptive analysis of the hedonic rating test showed that the mean overall liking score for the original gudril crackers was 5.85, while the variant with added mackerel meat obtained the highest score (mean = 6.24), and the variant with added mackerel bone received a score of 5.76. A one-sample t-test with a test value of 6.0 indicated that none of the variants showed a significant difference ($p > 0.05$) at a 95% significance level.

The results of the hedonic test show that all variants of the gudril crackers were generally acceptable to consumers. However, there are some areas for improvement that the UMKM Good Real Pasundan could consider. Firstly, the savory flavor of the product could be enhanced, based on feedback from respondents who desired a stronger savory taste. Additionally, it is important to address the responses from those who disliked the fishy aroma and taste of the gudril crackers with added mackerel bone.

4. Conclusion

The results demonstrate that both the original gudril crackers and the mackerel meat variant were well-received by the panelists. The mackerel meat variant exhibited superior taste, while the original crackers were preferred in terms of color. The texture of both variants also received positive responses. However, there is room for improvement, particularly for the mackerel-enriched variant, where the savory flavor, aroma, and texture could be optimized. In general, the aroma of the gudril crackers has the potential for enhancement. These findings provide valuable information for producers to develop gudril cracker products with greater consumer appeal.

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