

ANALYSIS OF CONSUMER CHOICE OF PROCESSED FISHERY PRODUCTS IN BALONGPANGGANG VILLAGE, GRESIK REGENCY, EAST JAVA.

Analisis Pemilihan Konsumen Terhadap Produk Perikanan Olahan di Kelurahan Balongpanggang Kabupaten Gresik, Jawa Timur.

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(Received July 8th 2026; Accepted August 24th 2026)

ABSTRACT

Gresik Regency has great potential in the fisheries sector, but its utilisation through processed products is not yet optimal, thus a deep understanding of consumer preferences is needed as a basis for designing marketing strategies. This research aims to understand what consumers like about processed fish products in the Balongpanggang area. The goal is also to identify which product attributes are the most important and which perform the best, as well as to observe differences in preference assessments based on consumer demographic characteristics. This research uses a descriptive quantitative approach with a survey method involving 105 respondents. Respondents were selected using a combination of convenience sampling and purposive sampling, specifically individuals who are easily accessible and have purchased or consumed local fishery processed products. Data were obtained through questionnaires in the form of a Likert scale and analysed using the Importance-Performance Analysis (IPA) method, the Kruskal-Wallis test, and the Spearman correlation test. The research shows that taste and trust are the main factors that must be maintained, while price is the main aspect that needs improvement. Differences in assessments based on limited demographic characteristics, namely age significantly affect the evaluation of taste attributes ($p=0.044$), and education significantly affects the evaluation of packaging attributes ($p=0.026$). Meanwhile, income does not have a significant impact, and consumption frequency is also not correlated with preference scores. This research suggests marketing strategies that include improving price perception, flavour innovation by considering age groups with higher average preferences, and enhancing packaging quality and more comprehensive product information.

Keywords: Consumer Preferences; Processed Fishery Products; Importance-Performance Analysis; Market Segmentation; Balongpanggang

ABSTRAK

Kabupaten Gresik memiliki kemampuan besar di bidang perikanan, tetapi penggunaannya melalui produk olahan belum cukup baik, sehingga dibutuhkan pemahaman yang dalam tentang selera konsumen sebagai dasar dalam merancang strategi pemasaran. Penelitian ini bertujuan untuk memahami apa saja hal yang disukai konsumen terhadap produk olahan ikan di wilayah Balongpanggang. Tujuan juga adalah mengidentifikasi mana atribut produk yang paling penting dan mana yang paling baik dalam kinerjanya, serta melihat perbedaan dalam penilaian preferensi berdasarkan karakteristik demografi konsumen. Penelitian ini menggunakan pendekatan kuantitatif deskriptif dengan metode survei terhadap 105 responden. Responden dipilih menggunakan kombinasi sampling kebetulan dan sampling purposive, yaitu orang yang mudah dijangkau dan pernah membeli atau mengonsumsi produk olahan perikanan lokal. Data diperoleh melalui kuesioner berbentuk skala Likert dan dianalisis menggunakan metode Importance-Performance Analysis (IPA), uji Kruskal-Wallis, serta uji korelasi Spearman. Penelitian menunjukkan bahwa rasa dan kepercayaan adalah faktor utama yang harus tetap dijaga, sementara harga adalah hal utama yang perlu diperbaiki. Perbedaan penilaian berdasarkan karakteristik demografi terbatas, yaitu usia mempengaruhi penilaian terhadap atribut rasa secara signifikan ($p=0,044$), dan pendidikan memengaruhi penilaian terhadap atribut kemasan secara signifikan ($p=0,026$). Sementara itu, pendapatan tidak berpengaruh signifikan, dan frekuensi konsumsi juga tidak berkorelasi dengan skor preferensi. Penelitian ini menyarankan strategi pemasaran yang mencakup peningkatan persepsi harga, inovasi rasa dengan memperhatikan kelompok usia yang memiliki preferensi lebih tinggi rata-ratanya, serta peningkatan kualitas kemasan dan informasi produk yang lebih lengkap.

Kata Kunci: Preferensi Konsumen; Produk Olahan Perikanan; Importance-Performance Analysis; Segmentasi Pasar; Balongpanggang

INTRODUCTION

Fish production both wild-caught and farmed in Gresik Regency holds significant potential as a source of raw materials for the fishery processing industry. In 2023, several key commodities demonstrated high production volumes: milkfish reached 90,000 tons; *Vannamei* shrimp, 17,000 tons; Mozambique tilapia (mujair), 8,900 tons; Nile tilapia (nila), 5,000 tons; and Javan barb (tawes), 4,000 tons (Rukyanto, 2024). This substantial production potential offers an opportunity to enhance value through the development of processed fishery products. Value addition entails upgrading raw materials into ready-to-consume products that offer advantages in terms of taste, form, shelf life, and packaging (Novita & Sundari, 2025). However, the increase in fishery production has not yet been fully matched by the optimal development of processed products capable of meeting market demands. This situation indicates that the utilization of fishery resources in Gresik Regency requires a more comprehensive understanding of consumer characteristics and preferences to serve as a foundation for developing competitive products.

Consumer preference is a crucial factor influencing the success of marketing processed food products, including processed fish products. Preferences reflect a consumer's inclination to choose a specific product based on an assessment of its features or attributes, thereby serving as the basis for purchasing decisions (Sriayudha & Nifita, 2018). Various product factors such as taste, texture, price, quality, size, color, and packaging appearance have been shown to influence how consumers perceive or evaluate a product. Among these attributes, taste, labeling, and price are the primary factors consumers consider when selecting food products, according to Symmank (2019). Therefore, understanding consumer preferences is essential not only for enhancing customer satisfaction but also for guiding product development, determining marketing strategies, and boosting the competitiveness of the fishery processing industry.

Studies indicate that consumer preferences for processed fish products depend on a combination of product attributes and the characteristics of the consumers themselves. Price influences the level of demand for fish; as prices decrease, the quantity demanded tends to rise (Muslimin *et al.*, 2021). Other research shows that price and taste significantly influence consumer choices regarding processed fish products, whereas packaging and texture have not shown a significant association (Fuliyana & Maria, 2022).

Furthermore, ease of access to products influences purchasing decisions, as it relates to consumer convenience in obtaining desired products (Wulandari *et al.*, 2022). These findings demonstrate that consumer preferences are multidimensional, necessitating product development strategies that consider various product attributes in an integrated manner.

Although numerous studies have identified factors influencing the desire to purchase processed fish products, most have focused on the impact of a single product attribute or the relationship between specific variables. Previous research has typically evaluated product attributes using descriptive analysis or Importance-Performance Analysis (IPA) in isolation, without integrating the results with consumer segmentation based on choice patterns or demographic characteristics. Additionally, research on consumer preferences in coastal areas which possess distinct socio-economic characteristics compared to urban areas remains limited. Balongpanggang District in Gresik Regency holds potential for developing processed fishery products; however, information regarding consumer preferences is limited, meaning marketing strategies do not yet fully align with market needs.

Given these circumstances, this study offers a novel contribution, particularly regarding its context and the integration of analytical approaches. Contextually, the study focuses on Balongpanggang District, Gresik Regency an area characterized by specific socio-economic traits and consumption habits that warrant detailed analysis. To date, data regarding consumer preferences for processed fish products in this area remains incomplete. Methodologically, the study combines Importance-Performance Analysis (IPA) with inferential statistical methods to identify attributes requiring priority improvement, examine differences in attribute ratings based on demographic characteristics, and assess the relationship between usage frequency and preference scores. This integration yields more targeted marketing recommendations based on product attributes and customer characteristics, without attempting market segmentation based on groups not analyzed in this study.

Accordingly, this study aims to analyze consumer preferences for processed fishery products in Balongpanggang District, Gresik Regency, by mapping the importance and performance levels of product attributes using the Importance-Performance Analysis (IPA) method and analyzing the impact of demographic characteristics on consumer preferences. The findings are expected to serve as a reference for formulating more effective and targeted marketing strategies, thereby enhancing the competitiveness of local processed fishery products.

RESEARCH METHODS

This study employs a quantitative approach with a cross-sectional survey design. The quantitative approach is used to determine consumer preferences regarding the attributes of processed fish products and to analyze differences and relationships among these preferences based on respondent characteristics. Data were collected using a closed-ended questionnaire featuring a 1-to-5 Likert scale and were subsequently analyzed using both descriptive and inferential methods.

Descriptive analysis was used to characterize the respondents and determine the mean ratings for product attributes. Furthermore, Importance-Performance Analysis (IPA) was employed to map the position of each attribute based on its level of importance and performance. The Kruskal-Wallis test was used to identify differences in attribute ratings

across age groups, education levels, and income levels. The relationship between consumption frequency and preference scores was analyzed using Spearman's Rank Correlation. All analyses were conducted using SPSS software version 25.

Design, Population, and Sample

This study employs a cross-sectional design. According to Capili (2021), a cross-sectional design is a type of observational research that collects data from participants at a single point in time, thereby describing the characteristics or prevalence of a condition within a population. While this design can identify differences or relationships between variables, it cannot establish causation between them. The study population consists of consumers who purchase and use processed fishery products in the Balongpanggang District. As the exact number of consumers meeting the study criteria is unknown, the sample size was determined using Cochran's formula for large or unknown populations: $n = Z^2p(1-p)/e^2$. Based on a 95% confidence level ($Z=1.96$), a maximum proportion of $p=0.50$, and a 10% margin of error ($e=0.10$), the minimum required sample size is approximately 96 respondents. A total of 105 individuals participated in the study, exceeding the minimum requirement. The sampling technique combined convenience sampling and purposive sampling, with the requirement that respondents had previously purchased or consumed local processed fishery products.

Data Collection Instruments and Techniques

The primary instrument used was a closed-ended questionnaire comprising:
Questions assessing the importance and performance levels of six product attributes—taste, packaging, price, trust, texture, and accessibility—using a 1-to-5 Likert scale.
(2) Questions regarding consumption frequency.

Data collection was conducted directly using the main research questionnaire, without a separate pilot test. Once all primary research data were collected, statistical analysis was performed on data from 105 respondents who met the inclusion criteria: having previously purchased or consumed local processed fishery products. Validity testing was conducted by calculating the Pearson correlation between individual item scores and the total scale score. With $N = 105$ and a two-tailed significance level of 5%, the critical r -value (r -table) was 0.191. An item was considered valid if the calculated r -value exceeded the r -table value and the significance level was below 0.05. Reliability testing was performed using the Cronbach's Alpha method, with an acceptable threshold of $\alpha > 0.70$. Test results indicated that all items in the importance and performance scales met the validity criteria. The Cronbach's Alpha values were 0.901 for the importance scale and 0.875 for the performance scale.

Data Analysis Method

The data analysis employed a descriptive approach to outline the respondents' profiles. Several methods were utilized in this study. The first method is Importance-Performance Analysis (IPA). IPA is used to identify attributes that are highly important yet underperforming, thereby highlighting them as key areas for improvement (Prayudha *et al.*, 2021). The mean scores for importance and performance for each attribute are plotted on a Cartesian diagram with performance on the X-axis and importance on the Y-axis dividing the diagram into four quadrants: high priority, maintain, low priority, and excess.

The second method applied involves inferential statistical testing to evaluate differences and correlations based on respondent characteristics. In this study, the Kruskal-Wallis test was used to examine differences in attribute ratings across variables with three or more groups, such as age, education level, and income level. The relationship between usage frequency and preference scores was analyzed using Spearman's correlation method. The Spearman test is a nonparametric method used to determine the direction and strength of the

monotonic relationship between two variables, applicable to both ordinal data and data that do not meet the assumptions of a linear relationship (Ahmed, 2025). All analyses were conducted using SPSS version 25.

RESULTS

Validity and Reliability Testing of the Instrument

The study did not employ a separate pilot test for the questionnaire; instead, the questionnaire was used directly to collect data for the main study. Subsequently, validity and reliability testing was conducted using data from the 105 respondents who met the study criteria. Validity was analyzed using Pearson item-total correlation, while reliability was assessed using Cronbach's Alpha. With $N = 105$, the critical r -value (r -table) at $\alpha = 0.05$ (two-tailed) was 0.191. All items on both the importance and performance scales yielded calculated r -values (r -count) exceeding the critical r -value, with significance levels below 0.001. The Cronbach's Alpha values were 0.901 for the importance scale and 0.875 for the performance scale.

Table 1. Validity and Reliability Test Results Based on Main Research Data

Scale/Item	calculated r	r-table	Sig.	Description
Importance – Taste	0,849	0,191	< 0,001	Valid Data
Importance – Texture	0,823	0,191	< 0,001	Valid Data
Importance – Packaging	0,816	0,191	< 0,001	Valid Data
Importance – Price	0,810	0,191	< 0,001	Valid Data
Importance – Trust	0,811	0,191	< 0,001	Valid Data
Importance – Ease of access	0,806	0,191	< 0,001	Valid Data
Performance – Taste	0,826	0,191	< 0,001	Valid Data
Performance – Texture	0,779	0,191	< 0,001	Valid Data
Performance – Packaging	0,772	0,191	< 0,001	Valid Data
Performance – Price	0,754	0,191	< 0,001	Valid Data
Performance – Trust	0,747	0,191	< 0,001	Valid Data
Performance – Ease of access	0,835	0,191	< 0,001	Valid Data
Cronbach's Alpha – Importance	0,901	–	–	Highly reliable
Cronbach's Alpha – Performance	0,875	–	–	Highly reliable

(Processed primary data, 2026)

Item-total correlation values for the importance scale ranged from 0.806 to 0.849, while those for the performance scale ranged from 0.747 to 0.835. All these values exceeded the critical r-table value of 0.191; consequently, all 12 assessment items were retained for analysis. Cronbach's Alpha values indicated good internal consistency for both the importance and performance assessment groups. This testing was conducted using the primary research data rather than data from the pilot questionnaire. Thus, the primary research data were subsequently used for IPA, Kruskal-Wallis, and Spearman Rank Correlation analyses.

Importance-Performance Analysis (IPA) of Processed Fishery Products

Table 2. Average Importance, Performance, and Gap Scores for Processed Fishery Product Attributes

Attributes	Importance	Performance	Gap (P-I)	Interpretation
Taste	4.640	4.540	-0.100	Very good, needs to be maintained
Texture	4.470	4.190	-0.280	Priority repairs
Packaging	4.380	4.350	-0.030	Good enough
Price	4.570	4.360	-0.210	Needs improvement
Trust	4.500	4.430	-0.080	Good
Ease of Access	4.350	4.340	-0.010	Good enough
Average	4.485	4.368		

(Processed primary data, 2026)

Based on Table 2, all attributes of the processed fishery products show negative gap values, indicating that the performance level perceived by consumers falls below the level of importance. The texture attribute exhibits the largest gap value (-0.280), followed by price (-0.210). Meanwhile, the gap values for the other attributes are -0.100 for taste, -0.080 for trust, -0.030 for packaging, and -0.010 for ease of access. These results demonstrate that, numerically, the widest gap between consumer expectations and perceived performance lies in the texture attribute. However, the magnitude of the gap value does not automatically designate an attribute as the primary priority for improvement. Determining improvement priorities within an IPA analysis requires considering the relative position of attributes based on their importance and performance levels on a Cartesian diagram. Therefore, the interpretation of strategic priorities relies on the attribute mapping results shown in Figure 1.

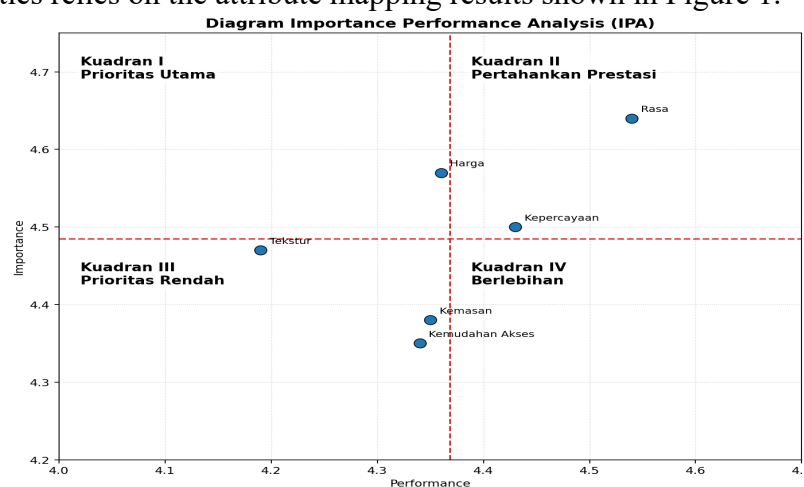


Figure 1. Importance-Performance Analysis (IPA) Cartesian diagram.

Based on Figure 1, there is a distinction between the magnitude of the gap shown in Table 2 and the determination of improvement priorities based on IPA quadrant positioning. The price attribute falls within Quadrant I (**Concentrate Here**), indicating that while it holds relatively high importance for consumers, its performance level remains relatively low. Consequently, price becomes the primary priority for improvement. Strategies to address this include enhancing the perceived alignment between price and product quality, offering various package sizes or volumes, and improving production efficiency to maintain competitive pricing.

The attributes of taste and trust are located in Quadrant II (**Keep Up the Good Work**). This positioning indicates that both attributes possess relatively high levels of importance and performance, making them key product strengths that should be maintained. Producers need to ensure flavor consistency and bolster consumer trust through quality assurance, safety measures, and clear product information.

Meanwhile, the attributes of texture, packaging, and ease of access fall into Quadrant III (**Low Priority**). Although texture shows the largest gap value in Table 2, its placement in Quadrant III indicates that it is of relatively lower importance compared to the attributes in Quadrants I and II. Thus, while texture still requires gradual improvement, it is not classified as a top priority. The same applies to packaging and ease of access; improvements in these areas can be made based on resource availability and consumer needs.

Quadrant IV (**Possible Overkill**) contains no research attributes. This indicates that there are no attributes achieving high relative performance in areas considered less important by consumers. Overall, the IPA results show that price is the top priority for improvement, while taste and trust are key strengths that should be maintained; meanwhile, texture, packaging, and ease of access can be improved gradually. Thus, the interpretations of Table 2 and Figure 1 are consistent: texture exhibits the largest numerical gap, yet price stands as the primary priority based on the attributes' positions within the IPA quadrants.

Table 3. Average Preference Scores Based on Demographic Characteristics

Variable	Group	Average Preference
Age	< 25 years	4.34
	25–34 years	4.65
	35–44 years	4.43
	45–54 years	4.35
	55 years	4.42
Education	Elementary School/Equivalent	4.45
	Junior High School/Equivalent	4.12
	Senior High School/Equivalent	4.58
	Diploma/Bachelor's Degree	4.46
	Master's/Doctoral Degree	4.55
Income	≤ Rp2,500,000	4.36
	Rp2,500,001–4,500,000	4.58
	Rp4,500,001–6,500,000	4.66
	≥ Rp6,500,001	4.48
Frequency	Rarely	4.39
	Sometimes	4.65

Variable	Group	Average Preference
	Often	4.45
	Very often	4.17

(Processed primary data, 2026)

This table summarizes average consumer preference scores based on four demographic characteristics. The 25–34 age group, those with high school or master's/doctoral education, middle-income earners (IDR 4,500,001–IDR 6,500,000), and consumers with an "occasional" consumption frequency exhibited the highest preference scores. Conversely, the group with junior high school education (or equivalent) and consumers who purchase "very frequently" recorded the lowest scores.

The Influence of Age on Consumer Preferences

Table 4. Kruskal-Wallis Test on the Effect of Age on Consumer Preferences

	Flavor	Texture	Packaging	Price	Trust	Convenience
Kruskal-Wallis H	9.813	2.742	7.492	7.833	4.745	8.021
df	4	4	4	4	4	4
Asymp. Sig.	0.044	0.602	0.112	0.098	0.314	0.091fo

(Processed primary data, 2026)

The Kruskal-Wallis test table indicates that only the taste attribute shows a significant difference among age groups ($p < 0.05$).

The Influence of Education Level on Consumer Preferences

Table 5. Kruskal-Wallis Test on the Effect of Education Level on Consumer Preferences

	Flavor	Texture	Packaging	Price	Trust	Convenience
Kruskal-Wallis H	5.264	4.044	11.064	7.474	7.379	5.993
df	4	4	4	4	4	4
Asymp. Sig.	0.261	0.4	0.026	0.113	0.117	0.2

(Processed primary data, 2026)

The Kruskal-Wallis test table indicates that only the packaging attribute shows a significant difference across education levels ($p < 0.05$).

The Influence of Income on Consumer Preferences

Table 6. Kruskal-Wallis Test on the Effect of Income on Consumer Preferences

	Flavor	Texture	Packaging	Price	Trust	Convenience
Kruskal-Wallis H	4.011	1.948	3.823	2.975	0.961	3.171
df	3	3	3	3	3	3
Asymp. Sig.	0.26	0.583	0.281	0.396	0.811	0.366

(Processed primary data, 2026)

The Kruskal-Wallis test table indicates that no attributes show significant differences based on income (all $p > 0.05$).

The Influence of Consumption Frequency on Consumer Preferences

Table 7. Spearman Correlation Test of the Effect of Consumption on Consumer Preferences

Variable	Mark
Spearman correlation (ρ)	0,082
Sig. (2-tailed)	0,406
Sample size (N)	105

(Processed primary data, 2026)

The Spearman correlation test table indicates that the correlation coefficient of 0.082 reflects a very weak positive relationship with a significance of 0.406 ($p > 0.05$), meaning there is **no significant relationship** between consumption frequency and consumer preference.

DISCUSSION

This study utilized data from 105 respondents who met the research criteria specifically, individuals who had previously purchased or consumed local processed fishery products. Questionnaires were administered directly to collect the primary research data, without a separate pilot test phase. Consequently, validity and reliability testing were conducted using the data obtained from the primary respondents before proceeding to Importance-Performance Analysis (IPA), the Kruskal-Wallis test, and Spearman's Rank Correlation.

The validity test results indicated that all assessment items within the importance and performance scales met the validity criteria. With a sample size of 105 respondents, the critical r-table value was 0.191 at a 5% significance level. Calculated r-values ranged from 0.806 to 0.849 for the importance group and from 0.747 to 0.835 for the performance group. All calculated r-values exceeded the r-table value and showed significance levels below 0.05. Correlating individual item scores with total scores served as the approach to assess how well the instrument items represented the measured construct; thus, positive and adequate item-total correlations demonstrated that the items were indeed related to the construct being measured. Therefore, all 12 assessment items used in the study were deemed valid and suitable for subsequent analysis. Furthermore, the relatively high correlation coefficients observed indicate that each attribute was significantly correlated with the total assessment score for both the importance and performance groups. These results demonstrate that the instrument consistently captured consumer assessments regarding taste, texture, packaging, price, trust, and ease of access.

Additionally, the reliability test results revealed excellent internal consistency. The Cronbach's Alpha value was 0.901 for the importance group and 0.875 for the performance group. The Cronbach's Alpha value is widely used to evaluate the internal consistency of an instrument specifically, the degree of inter-item relatedness and consistency in measuring the same construct. A reliability level of 0.80 or higher typically indicates excellent or high internal consistency (Kaligis *et al.*, 2022).

The Cronbach's Alpha value obtained in this study indicates that the respondents' ratings of the product attributes demonstrate strong internal consistency. Consequently, the rating data for the six product attributes taste, texture, packaging, price, trust, and ease of access can serve as a basis for analyzing consumer preferences. This is significant because the results of the Importance-Performance Analysis (IPA) and subsequent statistical tests are more interpretable when the measurement instrument possesses adequate levels of validity and reliability.

Overall, these test results provide a statistical basis confirming that the importance and performance rating data obtained from the main research questionnaire are suitable for use in subsequent analyses. The instrument testing was conducted using data collected during the main study rather than from a separate pilot study; therefore, the validity and reliability results should be understood as an evaluation of the instrument's psychometric quality based on the specific research sample employed. Subsequently, Importance-Performance Analysis (IPA) was utilized to identify which product attributes should be maintained and which require improvement, based on the consumer rating data.

Following the validity and reliability tests, the complete set of respondent ratings was used to map the position of each product attribute via Importance-Performance Analysis (IPA). The IPA results presented in Table 2 show that the mean importance score (4.485) exceeds the mean performance score (4.368). All attributes exhibited negative gap values, indicating that

perceived performance fell short of consumer expectations regarding importance. As this study did not specifically measure satisfaction, these results are interpreted as a gap between expectations and performance rather than as a direct measure of consumer satisfaction levels. The taste attribute recorded the highest importance score (4.640) and the highest performance score (4.540), with a gap of -0.100, establishing it as the product's primary strength. This finding aligns with research by Anastasia *et al.* (2021) and Fadlan *et al.* (2022), which identifies taste as a key attribute in purchasing decisions for processed fishery products. Conversely, the texture attribute exhibited the largest gap (-0.280), indicating a need to improve texture consistency through raw material quality control and formulation standardization consistent with Gultom *et al.*'s (2021) research on the impact of texture on consumer preference. The price attribute, with a gap of -0.210, indicates that price remains a major consideration specifically the value-for-money aspect supporting the findings of Anastasia *et al.* (2021) and Fadlan *et al.* (2022). Attributes such as trust (-0.080), packaging (-0.030), and ease of access (-0.010) showed relatively small gaps, reflecting positive consumer assessments regarding product safety, packaging appearance, and product availability.

Based on the IPA Cartesian diagram mapping, price falls within Quadrant I (**Concentrate Here**) as a top priority for improvement; this is consistent with Noventy *et al.*'s (2023) finding that price is a priority attribute for improvement among canned fish consumers. Necessary strategies include enhancing product value-added, adjusting packaging sizes, and optimizing production cost efficiency, as recommended by Adrian and Keni (2023) regarding the impact of perceived price fairness on customer satisfaction. Taste and trust attributes are located in Quadrant II (**Keep Up the Good Work**) as key strengths to be maintained through flavor innovation and the reinforcement of Halal certification aligning with Tao *et al.* (2023), who emphasized the crucial role of trust in consumer choices regarding Halal food. The attributes of texture, packaging, and ease of access fall within Quadrant III (Low Priority); however, texture exhibits the largest gap (-0.28), necessitating gradual attention particularly regarding the consistency of crispness, tenderness, and chewiness in alignment with the specific characteristics of each fish product type (Astuti *et al.*, 2024). Quadrant IV (Possible Overkill) remains empty, indicating an absence of resource waste. Overall, the IPA mapping results provide a differentiated strategic direction: focusing resources on improving price perception as an urgent priority, maintaining taste quality and trust as competitive advantages, and implementing gradual improvements to texture attributes (Anam *et al.*, 2023).

The Influence of Age on Consumer Preferences

The analysis results indicate that the 25–34 age group had the highest average preference score (4.65), while the group under 25 years of age had the lowest (4.34). The 35–44, 45–54, and ≥55 age groups showed relatively similar preference values, ranging from 4.35 to 4.43. The Kruskal-Wallis test revealed that taste was the only attribute showing a significant difference across age groups ($p = 0.044$; $p < 0.05$), whereas other attributes showed no significant differences. These findings indicate variations in taste perception across age groups but are insufficient to infer a causal relationship or specific levels of sensory sensitivity, as these were not directly measured. Descriptively, the 25–34 age group exhibited the highest average preference score; consequently, this group could be considered a target segment for developing flavor variations, provided that product quality consistency is maintained.

The Influence of Education Level on Consumer Preferences

Respondents with Master's/Doctoral degrees and those with high school education (SMA) exhibited relatively high average preference scores, whereas the group with junior high school education (SMP) or equivalent showed the lowest average preference (4.12). Kruskal-Wallis test results indicate a significant difference across education groups regarding the

assessment of packaging attributes, with a significance value of 0.026 ($p < 0.05$). These findings demonstrate that packaging assessments vary according to education level; however, this cannot be directly interpreted as a linear pattern where higher education necessarily equates to a more critical perspective. The practical implication is that producers need to enhance packaging quality by presenting product information that is comprehensive, clear, and easily understood by consumers across diverse educational backgrounds, while also complying with relevant legal and food safety regulations.

The Influence of Income on Consumer Preferences

The respondent group with an income of IDR 4,500,001–IDR 6,500,000 exhibited the highest average preference score (4.66), whereas the group with an income of $\leq$ IDR 2,500,000 showed a lower average (4.36). However, the Kruskal-Wallis test indicated that income levels did not result in significant differences in the ratings of any attributes ($p > 0.05$). Thus, income disparities within the study sample were not found to be associated with differences in product attribute ratings. From a practical standpoint, producers still need to adjust their pricing strategies based on the IPA results, as price falls within Quadrant I an area characterized by high importance but relatively low performance. Consequently, improvements should focus on enhancing the perceived alignment between price and quality, offering varied package sizes or volumes, and optimizing production costs, rather than simply applying a uniform price for all consumers.

The Influence of Consumption Frequency on Consumer Preferences

Respondents who consumed the product occasionally (once a month) recorded the highest preference score (4.63), whereas those who purchased the product very frequently had a slightly lower average score (4.17). The Spearman Rank Correlation test yielded a correlation coefficient of $\rho = 0.082$ with a significance value of 0.406 ($p > 0.05$), indicating a positive yet very weak and statistically insignificant relationship. Consequently, the hypothesis positing a relationship between consumption frequency and consumer preference was rejected. These findings differ from those of Giacalone *et al.* (2022), who demonstrated that consumer preference could predict consumption frequency when combined with emotional and situational factors, and Eberle *et al.* (2022), who explained that consumption frequency acts as a variable strengthening the relationship between consumer attitudes and the intention to purchase food products. The lack of a significant relationship in this study suggests that consumer preference for processed fishery products in Balongpanggang District is influenced by other factors, such as quality perception, product image, food safety, and brand loyalty.

CONCLUSION

Based on an analysis of consumer preferences for processed fishery products in Balongpanggang District, Gresik Regency, it can be concluded that taste and trust are the products' key strengths characterized by high importance and performance—that must be maintained. Conversely, price stands out as the top priority for improvement, falling into the "high importance/lower performance" quadrant. Attributes such as texture, packaging, and accessibility are classified as low-priority based on IPA mapping; however, texture exhibits the largest gap between expectation and performance, warranting attention for gradual improvement. Demographic characteristics show limited variation in attribute ratings: age significantly influences taste perception, and education significantly affects packaging perception, whereas income shows no significant difference. Consumption frequency also bears no significant relationship to preference scores. Consequently, marketing strategies should focus on improving price perception by aligning price with value and quality,

developing flavor variations that cater to consumer groups with higher preference levels, and enhancing packaging quality and the completeness of product information.

ACKNOWLEDGEMENT

We gratefully acknowledge the grant funding provided by the Directorate General of Higher Education through the 2026 Affirmation-based Early-Career Lecturer Research scheme, as well as the facilities provided by Sunan Gresik University. We also extend our thanks to all respondents in Balongpanggang District who participated, as well as the research team and all parties involved in facilitating the smooth conduct of this research.

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