

## Factors Affecting The Demand For Tilapia Fish (*oreochromis niloticus*) At Tanjung Market, Tabalong Regency

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### **Abstract.**

*The demand for Tilapia fish is not determined only by food needs. Consumers also consider price, fish freshness quality, household income, family size, market access, and consumption habits. This study aimed to analyze consumer characteristics and the factors affecting the demand for Tilapia fish at Tanjung Market, Tabalong Regency. This topic is important because Tanjung Market is a center of food trade and Tilapia fish is a widely consumed source of animal protein among households. The study used a descriptive quantitative approach supported by multiple linear regression analysis. A total of 96 consumers were selected through accidental sampling based on age, willingness to be interviewed, and the purchase of Tilapia fish during the study period. Data were collected through observation, structured interviews, questionnaires, and documentation. The research variables included fish price, fish quality as a dummy variable, consumer income, family size, and the quantity of Tilapia fish demanded. The results showed that respondents were dominated by bachelor's degree graduates at 30.2%, employees at 24.0%, residents of Belimbing at 27.1%, and married respondents at 55.2%. All respondents stated that psychographic aspects, income effects, market access, and proximity to the market influenced purchasing decisions. The regression model fulfilled the classical assumptions, with a normality significance value of 0.058, no multicollinearity, a Durbin-Watson value of 2.091, and no heteroscedasticity. The R Square value of 0.538 indicated that the model explained 53.8% of the variation in Tilapia fish demand. The F-test produced an F-value of 26.469 with a significance level of <0.001. Partially, only price had a negative and significant effect on Tilapia fish demand, with a coefficient of -0.000045, a t-value of -10.189, and a significance level of <0.001. Fish quality as a dummy variable, income, and family size did not have significant partial effects. Consumers at Tanjung Market were highly price-sensitive in determining the quantity of Tilapia fish purchased.*

**Keywords:** demand, price, quality, income, Tilapia fish and Tanjung Market.

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## I. INTRODUCTION

Tanjung Market is one of the main trading centers in Tabalong Regency. People purchase daily food needs in this market, including Tilapia fish as a source of animal protein. The demand for Tilapia fish is not determined only by food needs. Consumers also consider price, fish freshness quality, household income, family size, market access, and consumption habits. These factors are consistent with consumer behavior theory, which views purchasing decisions as the result of interactions among cultural, social, personal, psychological, and economic factors (Kotler & Keller, 2016).

The fisheries context of Tabalong Regency shows a positive development. Fish catches increased from 1,816,900 kg in 2020 to 2,163,414 kg in 2024. Aquaculture production also increased from 14,012,962 kg to 18,075,501 kg over the same period. On the demand side, the per capita indicator of Tilapia fish consumption increased from 6.176 kg per capita per year in 2021 to 6.780 kg per capita per year in 2024. Population growth, from 253,305 people in 2020 to 264,694 people in 2024, also expanded the regional food-demand base. This condition indicates that increased production, population growth, and food access play a role in strengthening the market for consumption fish (DKPPTPH Kabupaten Tabalong, 2025).

The increase in Tilapia fish prices has become an important issue in consumer purchasing behavior. The average price of Tilapia fish at Tanjung Market rose from IDR 28,000 per kg in 2020 to

IDR 36,000 per kg in 2024. This increase may affect household purchase volume because Tilapia fish is a daily food commodity. In traditional markets, consumers often adjust the quantity purchased when prices rise, especially when cheaper protein substitutes are available. This relationship is consistent with demand theory and previous findings on consumer sensitivity to changes in fresh fish prices (Apituley et al., 2023).

Theoretically, consumer demand is influenced by both economic and non-economic factors. Kotler and Keller (2016) explain that consumer decisions are related to cultural, social, personal, and psychological factors. Price reflects the cost that consumers must pay to obtain the benefits of a product. Fish quality reflects freshness, cleanliness, texture, and aroma. Income reflects purchasing power. Family size represents household consumption needs. The combination of these factors needs to be tested empirically so that Tilapia fish marketing strategies can be formulated more appropriately (Kotler & Keller, 2016).

Research on the demand for Tilapia fish at Tanjung Market, Tabalong Regency, remains limited. In fact, this market has an important position in the distribution of freshwater fish and household consumption needs. Previous studies have shown that fish demand is influenced by price, income, taste, market access, product quality, and household consumption habits (Luhur et al., 2020). This study aimed to analyze consumer characteristics and the factors affecting the demand for Tilapia fish at Tanjung Market, Tabalong Regency.

## II. METHODS

### 2.1. Research Location and Time

The research was conducted at Tanjung Market, Tabalong Regency, South Kalimantan Province.

### 2.2. Population and Sample

The research population consisted of all consumers purchasing tilapia fish at Tanjung Market, Tabalong Regency. The sampling technique used accidental sampling, where respondents were selected based on direct encounters with the researcher, meeting the research criteria, and agreeing to be interviewed. The sample size was 96 respondents, based on Lemeshow's calculations with a 95% confidence level and a 10% margin of error.

Respondent Criteria:

- Aged over 20 years
- Willing to be interviewed
- Purchased tilapia fish for consumption at Tanjung Market during the research period

This technique is suitable for market research with a dynamic buyer population that is not fully administratively recorded (Jaya, 2020).

### 2.3. Research Variables

The variables in this study include:

- Dependent variable (Y): Quantity of tilapia fish purchased (kg)
- Independent variables (X):
  - o X1 = Price of fish per kg
  - o X2 = Fish quality (dummy)
  - o X3 = Consumer income per month
  - o X4 = Number of family members

Fish quality is measured using the following indicators:

- Clear eyes
- Firm flesh
- Cleanliness
- Appropriate size
- Fresh aroma

For regression purposes, fish quality is transformed into a dummy variable based on the median score:

- Code 0 = low quality
- Code 1 = high quality

The determination of this variable refers to the concept of product attributes and product quality that influence consumer decisions (Ulfa, 2020).

#### 2.4. Data Analysis Model

The multiple linear regression model used is:

$$Y = \alpha + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + e$$

Description:

- Y = quantity demanded of tilapia fish
- $\alpha$  = constant
- $\beta_1$ – $\beta_4$  = regression coefficients
- X1 = fish price
- X2 = fish quality dummy
- X3 = consumer income
- X4 = number of family members
- e = error term

#### 2.5. Statistical Tests and Classical Assumptions

Model testing was conducted through:

- Validity test
- Reliability test
- Normality test
- Linearity test
- Multicollinearity test
- Autocorrelation test
- Heteroscedasticity test
- Coefficient of determination ( $R^2$ )
- F-test (simultaneous)
- t-test (partial)

All tests were conducted at the 5% significance level. This procedure follows the principles of regression model testing and classical assumptions in econometric analysis (Gujarati & Porter, 2009).

### III. RESULTS AND DISCUSSION

#### General condition of Tanjung Market

Tanjung Market is located in Tanjung District, the administrative and economic center of Tabalong Regency. Tabalong Regency has a strategic position because it connects South Kalimantan, Central Kalimantan, and East Kalimantan. This location supports the mobility of traders and consumers and facilitates the distribution of fisheries products. The position of Tanjung District as the center of regional activities strengthens the market's function in food trade and fisheries commodity distribution (Hutabarat et al., 2020).

Fish commodities at Tanjung Market come from freshwater aquaculture and capture fisheries. The fish traded include Tilapia fish, catfish, pangasius, gourami, snakehead fish, and marine fish from the coastal areas of South Kalimantan. The availability of freshwater fish is relatively stable because it is supported by aquaculture centers in several districts. The supply of marine fish depends more on distribution, weather, fishing seasons, and transportation costs. These supply conditions are consistent with studies stating that access, distribution, and product availability influence fish consumption and household demand (Arthatiani & Apriliani, 2019).

### Consumer characteristics

The study involved 96 respondents. Respondent characteristics show that consumers of Tilapia fish at Tanjung Market had diverse educational, occupational, residential, and marital backgrounds. The dominant respondent profile is presented in Table 1. These characteristics are important because food purchasing decisions are influenced by personal, social, economic, and experiential factors in assessing product benefits (Kotler & Keller, 2016).

**Table 1. Characteristics of Tilapia fish consumers at Tanjung Market**

Dimension	Dominant category/indicator	Frequency	Percentage
Education	Bachelor's degree	29 persons	30.2%
Occupation	Employee	23 persons	24.0%
Residence	Belimbing	26 persons	27.1%
Marital status	Married	53 persons	55.2%
Psychographic	Attitudes, values, interests, and lifestyle agreed	96 persons	100%
Socio-economic	Income influenced purchasing	96 persons	100%
Geographic	Market access and location proximity agreed	96 persons	100%

Most respondents had a bachelor's degree. This condition indicates that some consumers have the ability to receive information about nutrition and product quality. The dominance of employees as the main occupational group indicates a consumer group with relatively fixed income. The married status of 55.2% also shows that Tilapia fish is widely purchased for household side-dish needs. In the psychographic dimension, all respondents stated that attitudes, values, interests, and lifestyle played a role in purchasing decisions. This confirms that the decision to purchase Tilapia fish is not determined only by price, but also by consumer evaluations of benefits, habits, and family consumption patterns (Kotler & Keller, 2016).

### Instrument quality and classical assumption tests

The validity test showed that all fish-quality indicators had calculated r-values greater than the table r-value of 0.201. This means that the fish-quality indicators were valid for measuring consumer perceptions. The initial reliability test did not meet the required standard because the Cronbach's Alpha value was negative. After data cleaning, the Cronbach's Alpha value increased to 0.636 and was declared reliable. In the final regression model, the fish-quality variable was transformed into a dummy variable so that the complete data from 96 respondents could still be analyzed. Instrument testing is necessary to ensure that each indicator truly measures the concept analyzed in the study (Ulfa, 2020; Gujarati & Porter, 2009)

**Table 2. Summary of instrument and classical assumption tests**

Test	Main result	Decision
Fish-quality validity	Calculated r-values of 0.387 to 0.480 > table r-value of 0.201	Valid
Reliability after data cleaning	Cronbach's Alpha 0.636	Reliable
Linearity	Price Sig. 0.870 and family size Sig. 0.105	Linear
Residual normality	Kolmogorov-Smirnov Sig. 0.058	Normal
Multicollinearity	Tolerance 0.980 to 0.992 and VIF 1.008 to 1.020	No multicollinearity
Autocorrelation	Durbin-Watson 2.091	No autocorrelation
Heteroscedasticity	All Sig. values > 0.05	No heteroscedasticity

The results of the classical assumption tests show that the regression model met the analytical requirements. The residuals were normally distributed. The relationships among the tested variables were linear. VIF values close to 1 indicated no high correlation among independent variables. The Durbin-Watson value of 2.091 indicated no autocorrelation. The heteroscedasticity test also showed no symptoms of unequal residual variance. Therefore, the regression model could be used to explain

the factors affecting the demand for Tilapia fish. Model feasibility is important because violations of classical assumptions may weaken the accuracy of regression-coefficient interpretation (Gujarati & Porter, 2009).

### Multiple linear regression analysis using a dummy variable

The coefficient of determination produced an R value of 0.733 and an R Square value of 0.538. This value indicates that price, fish quality as a dummy variable, income, and family size explained 53.8% of the variation in Tilapia fish demand. The remaining 46.2% was influenced by factors outside the model, such as taste, purchase frequency, fish availability, family eating habits, seller service, and the existence of substitute products. This result is consistent with studies on fish demand showing that household purchasing behavior is not determined only by economic variables, but also by preferences and market access (Gujarati & Porter, 2009; Luhur et al., 2020; Muhammad et al., 2022).

**Table 3. Multiple linear regression results for Tilapia fish demand**

Variable	Coefficient B	Std. Error	Beta	t	Sig.
Constant	21.636	1.943	-	11.133	<0.001
Price (X1)	-0.000045	0.000	-0.734	-10.189	<0.001
Fish quality dummy (X2)	-0.048	0.107	-0.032	-0.448	0.655
Income (X3)	4.430E-10	0.000	0.001	0.012	0.990
Family size (X4)	-0.009	0.031	-	-0.293	0.770

Table 3, the regression equation can be written as  $Y = 21.636 - 0.000045X_1 - 0.048X_2 + 4.430E-10X_3 - 0.009X_4 + e$ . The F-test produced an F-value of 26.469 with a significance level of <0.001. This value is below 0.05, meaning that price, fish quality as a dummy variable, income, and family size simultaneously had a significant effect on Tilapia fish demand. The regression model was therefore feasible for interpreting consumer demand behavior at Tanjung Market. This simultaneous interpretation is consistent with the principle of regression testing, in which independent variables may be assessed jointly to explain variation in the dependent variable.

The study successfully developed a valid and unbiased regression model through systematic mitigation of data constraints. The reliability problem in the continuous data of the fish-quality variable (X2) was addressed by converting the scale into a binary dummy variable based on the median data, with scores  $\leq 19$  classified as low quality and coded 0, and scores  $\geq 20$  classified as high quality and coded 1. This step maintained the integrity of the original data from 96 respondents without reducing sample representation.

After the dummy variable was formed, the classical assumption tests were conducted comprehensively. The test results showed that the residuals were normally distributed, the model was free from multicollinearity, no autocorrelation was present, and heteroscedasticity was absent. Thus, the regression model using the complete data from 96 respondents fulfilled the Best Linear Unbiased Estimator (BLUE) requirements.

The analysis showed that the combination of price, fish quality as a dummy variable, income, and family size explained 53.8% of the variation in Tilapia fish demand. This value indicates that more than half of the changes in Tilapia fish demand could be explained by the variables tested, while the remaining variation was influenced by other factors outside the model. Simultaneously, the F-test showed a significance value of <0.001 with an F-value of 26.469, so the model was declared feasible for explaining the demand for Tilapia fish at Tanjung Market, Tabalong Regency. The use of multiple linear regression in this study is consistent with the concept of analyzing relationships among variables in econometric models (Gujarati & Porter, 2009). In addition, the model fulfilled the classical assumptions, resulting in valid and unbiased estimates (Wooldridge, 2016).

The demand for Tilapia fish is basically influenced by various household socio-economic factors, especially income and family size (Adiana & Karmini, 2012). This is consistent with studies showing that household fish consumption strongly depends on family economic conditions (Aini,

2019). The consumption of animal-source foods also tends to differ according to household income levels (Ariani et al., 2018). Household consumer characteristics, such as family size and consumption habits, also influence fish-demand patterns (Arthatiani, 2018). Fish-consumption participation is an important indicator in fulfilling the need for animal protein in society (Arthatiani & Apriliani, 2019).

In Tabalong Regency, population growth has contributed to the increasing need for fish consumption each year (Badan Pusat Statistik Kabupaten Tabalong, 2025). This condition is supported by the increasing production of aquaculture and capture fisheries, which has shown a positive trend in recent years (DKPPTPH Kabupaten Tabalong, 2025). Nationally, fish also holds an important position as a source of animal protein in community consumption patterns (Badan Ketahanan Pangan, 2018). This indicates that the demand for Tilapia fish at Tanjung Market cannot be separated from production, distribution, and the continuously increasing consumption needs of the community.

Partially, the t-test results showed that only price had a negative and significant effect on Tilapia fish demand, with a beta value of -0.734. This means that when the price of Tilapia fish increases, consumers tend to reduce the quantity purchased. This finding strengthens the view that the selling price of fresh fish is a major factor in consumer purchasing decisions (Apituley et al., 2023). Other research also explains that increases in fish prices can encourage consumers to reduce purchase volume or switch to cheaper substitute products (Buhang, 2015). Local market conditions further strengthen price sensitivity in fish-purchasing decisions (Harianto & Solekan, 2016). This indicates that consumer behavior at Tanjung Market is highly sensitive to price changes.

The fish-quality dummy variable in this study did not have a significant partial effect on Tilapia fish demand. Nevertheless, product quality remains one aspect considered in consumer purchasing decisions (Kotler & Keller, 2016). Good fish quality may increase consumer purchase interest (Suryana et al., 2019). Consumer psychological factors also play a role in shaping perceptions of product quality (Fauzi et al., 2023). However, in this study, the non-significant effect of quality was presumably caused by the relatively uniform quality of fish sold among traders, so consumers focused more on price comparisons than quality differences.

Consumer income also did not have a significant partial effect on Tilapia fish demand. Theoretically, income is related to consumer purchasing power (Asriani et al., 2016). In practice, however, household income does not always determine fish consumption levels because income is also allocated to other basic needs (Aini, 2019). Similar findings show that income level is not always the dominant factor in fish demand because consumers may adjust fish-type choices according to their respective economic capacity (Muhammad et al., 2022). In the context of Tanjung Market, Tilapia fish is considered a relatively affordable protein source, so it can still be purchased by consumers across different income levels.

Family size also did not have a significant partial effect on Tilapia fish demand. In general, family size may influence household consumption volume (Luhur et al., 2020). However, consumption patterns within families are not always linear because they are influenced by eating habits and family-member preferences (Tiffany et al., 2020). Socio-economic and cultural factors may also influence overall fish-consumption levels (Muhammad et al., 2022). Therefore, family size at Tanjung Market is not necessarily the main factor determining the demand for Tilapia fish.

The results show that the decision to purchase Tilapia fish at Tanjung Market was more strongly influenced by price than by fish quality, income, or family size. This is consistent with consumer behavior theory, which states that purchasing decisions are influenced by price, product, and consumer psychological conditions (Kotler & Keller, 2016). In addition, internal and external factors such as perception, motivation, and the social environment also shape consumer behavior in selecting food products (Hawkins & Mothersbaugh, 2010). Therefore, Tilapia fish marketing

strategies at Tanjung Market should focus more on price stability and supply availability to maintain consumer demand.

#### IV. CONCLUSION

The characteristics of Tilapia fish consumers at Tanjung Market, Tabalong Regency, were dominated by respondents with bachelor's degree education, employees, residents of Belimbing, and mostly married respondents. This profile indicates that Tilapia fish consumers had diverse socio-economic backgrounds. The analysis showed that price, fish quality, income, and family size simultaneously had a significant effect on Tilapia fish demand, with the model explaining 53.8% of demand variation. However, partially, only price had a negative and significant effect on Tilapia fish demand, whereas fish quality, income, and family size did not have significant effects. This finding indicates that price is the main factor determining the quantity of Tilapia fish purchased by consumers at Tanjung Market, Tabalong Regency.

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