



# Analysis of fish consumption patterns in the people of Bekasi Regency, West Java

Saka Tirta Septya\*

Universitas Terbuka, Agribusiness Department, South Tangerang, Banten, Indonesia, 15437

**Abstract** - Bekasi people's awareness to consume fish is still very low. Though fish is one of the foods that are cheap, easy to find, and have a high nutritional content. The purpose of this study was to analyze fish consumption patterns. The study was conducted by analyzing primary data on fish consumption patterns influenced by perceptions and preferences for fish products through direct interviews with 110 household members. The methods used in this study are descriptive analysis, logit analysis, quantitative analysis using the Chi-square test. The choice of fish as a source of animal protein consumed shows the consumption pattern of fresh fish both freshwater fish and seawater fish, based on the frequency of consumption patterns included in the large category, namely 70.9% fresh seawater fish and 24.5% fresh freshwater fish.

**Keywords:** Bekasi regency, Chi-square, fish consumption, logit

## 1 Introduction

To overcome the low consumption of fish in Indonesia, many studies have been conducted to reveal the supporting and inhibiting factors of people eating fish. In addition, in parallel, activities to increase fish consumption are becoming increasingly central. The "Gemarikan" (Gerakan Memasyarakatkan Makan Ikan) campaign is one of the featured programs.

According to the Direktorat Jenderal Penguatan Daya Saing Produk Kelautan dan Perikanan (2020), fish protein contributes the largest in the group of animal protein sources, which is 51.7% compared to meat, milk and eggs. In line with that, Indonesia has a great opportunity to make fish as the main source of protein to improve people's nutrition, because the country's fisheries potential is very abundant.

Kementerian Kelautan dan Perikanan (KKP) noted that the national fish consumption rate reached 55.37 kg/capita in 2021. This figure grew 1.48% compared to the previous year which amounted to 54.56 kg / capita. On trend, national fish consumption has tended to increase in the last decade. In 2011, the national fish consumption rate was only 32.25 kg / capita. This means that the national fish consumption rate in 2021 increased by around 69.17% compared to 10 years ago. The number of fish consumption in Indonesia recorded the highest increase of 8.32% to 38.14 kg / capita in 2014. Meanwhile, the lowest increase in fish consumption occurred in 2020 which was only 0.11% to 54.56 kg/capita (Annur, 2022).

In addition to this, the choice of a person or a community group in consuming fish is strongly influenced by many factors, including people around the Bekasi Regency area which according to the

---

\*Corresponding Author: [tirta42@gmail.com](mailto:tirta42@gmail.com)

author's observations are very diverse in social status. As a buffer for Jakarta, Bekasi Regency has always been identified with industrial and service districts. Therefore, the community is very heterogeneous from various tribes, customs and customs (Purwanto, 2021). Based on 2018 data in Bekasi Regency, there are still 23,184 toddlers who are stunted (Surjaya, 2019).

Factors that affect fish consumption are internal and external factors. Internal factors include education level, income level, nutritional knowledge, household size. While external factors can be in the form of fish availability, fish characteristics and ease of obtaining fish. These factors are thought to influence decisions in fish consumption. From these factors, fish consumption patterns in Bekasi Regency will be analyzed.

## 2 Research Methods

The study was conducted by analyzing primary data on fish consumption patterns conducted through interviews and questionnaires directly to 110 household members. At this stage, sampling is carried out using the systematic random sampling method. Processing and analysis of data obtained from survey results are processed using SPSS software. Descriptive analysis of respondents or consumers obtained through interviews and questionnaires conducted on demographic aspects. The methods used in this study include descriptive analysis, logit analysis, quantitative analysis using the Chi-square test.

This quantitative analysis is used in research which includes Chi-Square test, logit analysis and correspondence analysis. The study was conducted using the Chi-Square test to determine the relationship between the frequency of fish consumption with demographic variables (gender, ethnicity, age, monthly expenditure, education level and occupation). From the results of the Chi-Square test, important variables were selected to be analyzed using correspondence analysis to see the close relationship between important variables and the frequency of fish consumption. The stages of data processing and analysis in this study can be schematically seen as in Figure 1.

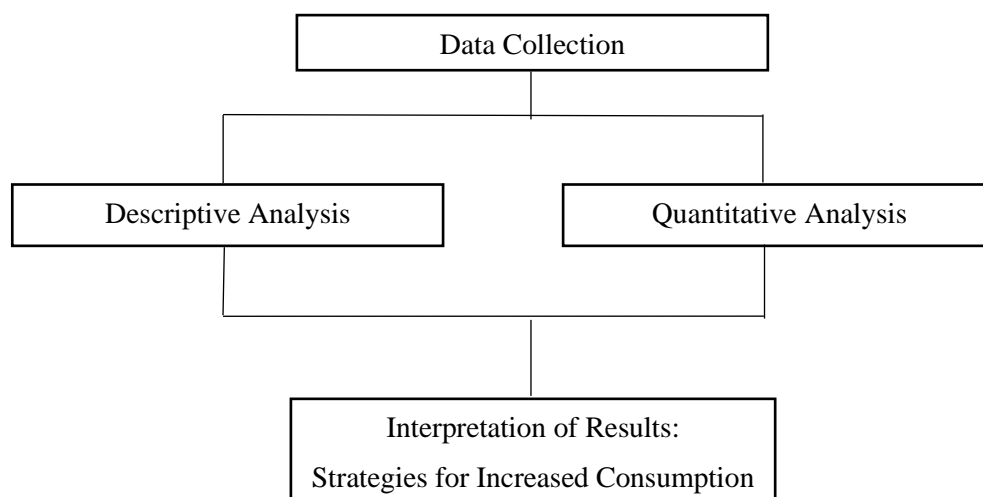


Fig. 1. Stages of Data Processing and Data Analysis

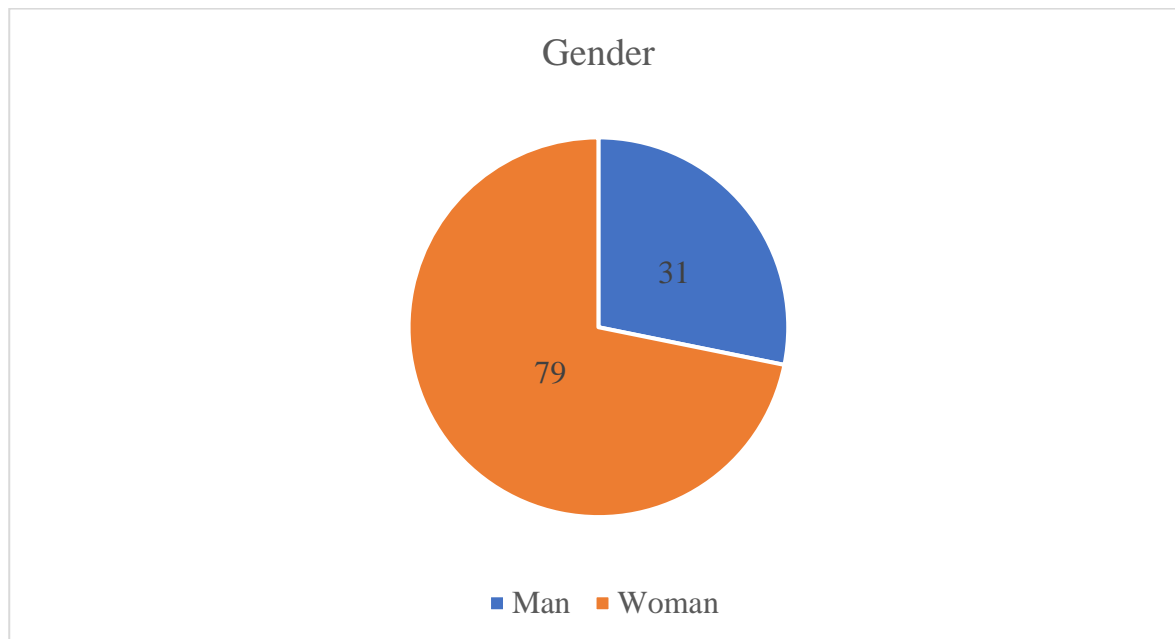
### 3 Results and Discussion

#### 3.1 Descriptive Analysis

Descriptive analysis is needed to provide a picture or demographic profile of a sample or population. This predetermined segment profile is obtained from the results of a table of 2 (two) dimensions between segments and consumer characteristics and graphs. Among them are gender, age group, occupation, ethnicity, last education and income group.

##### 3.1.1 Gender

It is known that the number of respondents is female compared to respondents with the male gender. Respondents with female sex amounted to 79 people or 71.8% and men 31 people or 28.2%. This is of course what researchers expect from respondent's housewives who are often a determining factor in the menu in the home kitchen, so that the data collected reflects the level of fish consumption in a household.



**Fig. 1.** Gender

##### 3.1.2 Age Group

The respondents of this study were divided into four with the most being the age group of 31-40 years amounting to 53 people or 48.2%, followed by the age group of >50 years or the elderly amounting to 24 people or 21.8%, then the age group of <30 years amounting to 17 people or 15.5% and the least was the age group of 41-50 years or 14.5%. The percentage of respondents aged 31-40 years shows that respondents who are used as samples in the study are the optimal proportion.

Based on age groups, it is known that young people under 30 years old have relatively different consumption patterns from previous generations. The trend of eating fast food with various flavors and colors attracts young people. As for the older generation, fresh fish dishes or traditional food are still a good choice. Awareness of safe nutritional intake is also a factor that needs to be considered in choosing fish as a source of protein for older age groups. While at the age of 41-50 years still carried away habits since childhood lack of fish consumption.

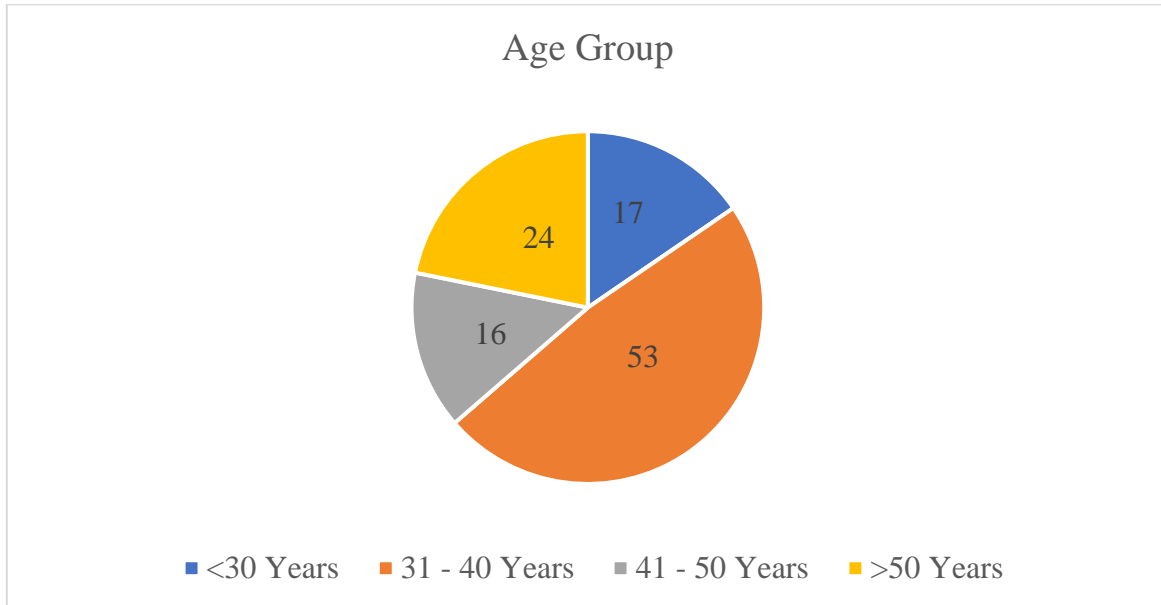


Fig. 2. Age

### 3.1.3 Jobs

Based on the type of work, most respondents in this study were Housewives (IRT) with a total of 48 people or 43.6%, then the second most were 28 people or 25.5% who worked as civil servants / TNI, then the third largest were private employees as many as 17 people, 15.5% and the rest were students, entrepreneurs, and laborers and other professions such as retirees.

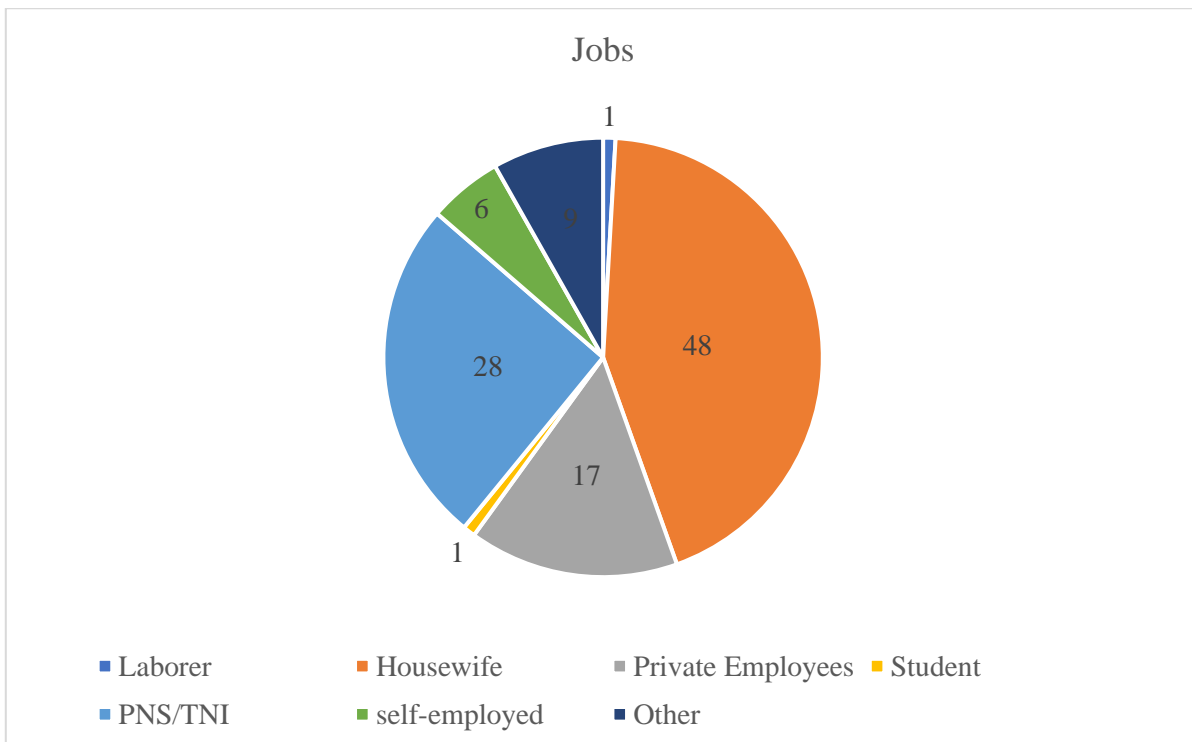


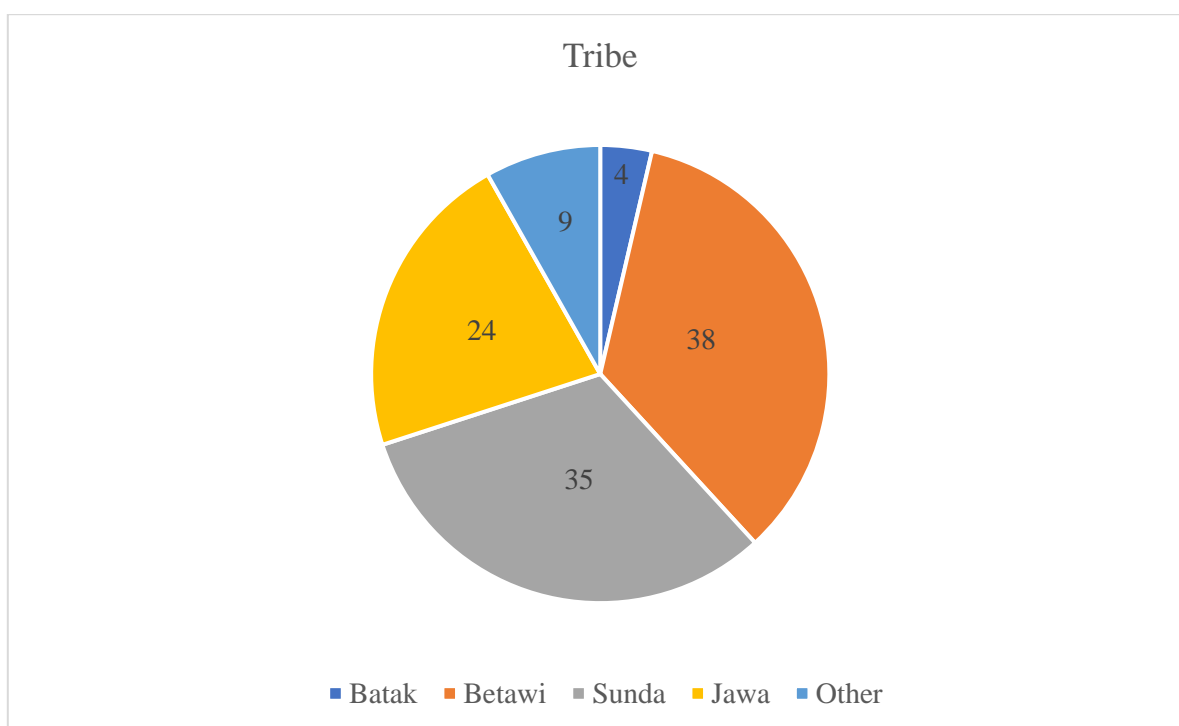
Fig. 3. Jobs

The number of respondents who become housewives is in line with the number of genders that are majority women. This is because when researchers visit the homes of respondents, housewives or people in charge of the kitchen know better what is consumed in the family.

### 3.1.4 Tribes

Based on ethnic characteristics, the highest respondents in this study amounted to 38 people or 34.5%. The results of research by the people of Bekasi Regency based on the most tribes from the Betawi tribe have 38 people or 34.5% and followed by the second Sundanese tribe totaling 35 people or 31.8%. Meanwhile, Java with 24 people or 21.8% and Batak tribes with 4 people or 3.6%. Other tribes include Malays, Bugis and Ambonese at 9 people or 8.2%.

The original population of Bekasi Regency is Betawi and Sundanese according to the target respondents, namely there are far more or more than half of the respondents of the Betawi and Sundanese tribes than respondents of Javanese, Batak and other tribes because when met at home the respondents found were mostly Betawi and Sundanese tribes. This is of course what researchers hope to get respondents of the Betawi and Sundanese tribes because they see the indigenous tribes of Bekasi Regency are the Betawi and Sundanese tribes.



**Fig. 4.** Tribe

### 3.1.5 Recent education

The majority of respondents completed their last education at the Bachelor (S1) level, which was 63 people or 57.3%, then 23 people or 20.9% at the high school level, then only 16 people or 14.5% to Postgraduate (S2) and others to 8 people or 7.3% before high school. The level of education of the respondents was almost evenly distributed for each level and indicated the heterogeneity of the sample obtained.

The choice of consuming fresh fish has shifted to processing methods as well as increasing the education level of respondents. Respondents with higher education, more and more people like processed fish and do not abandon their fresh fish consumption. Next is the analysis on income groups.

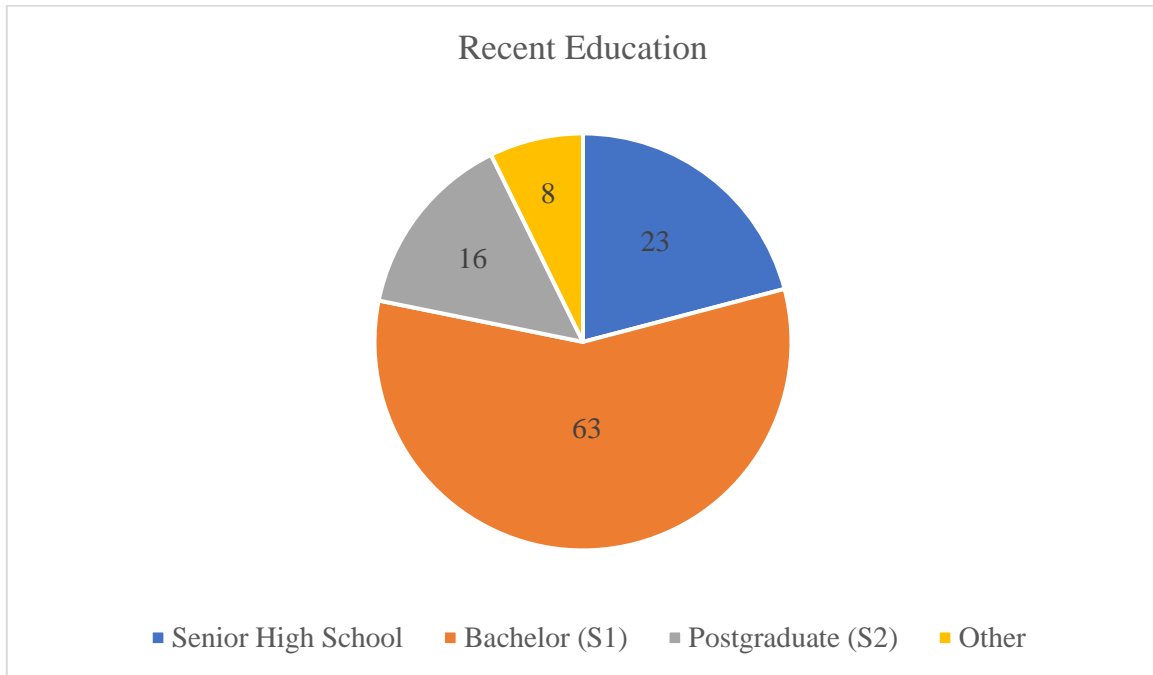


Fig. 5. Recent Number of Educations

### 3.1.6 Monthly household expenses

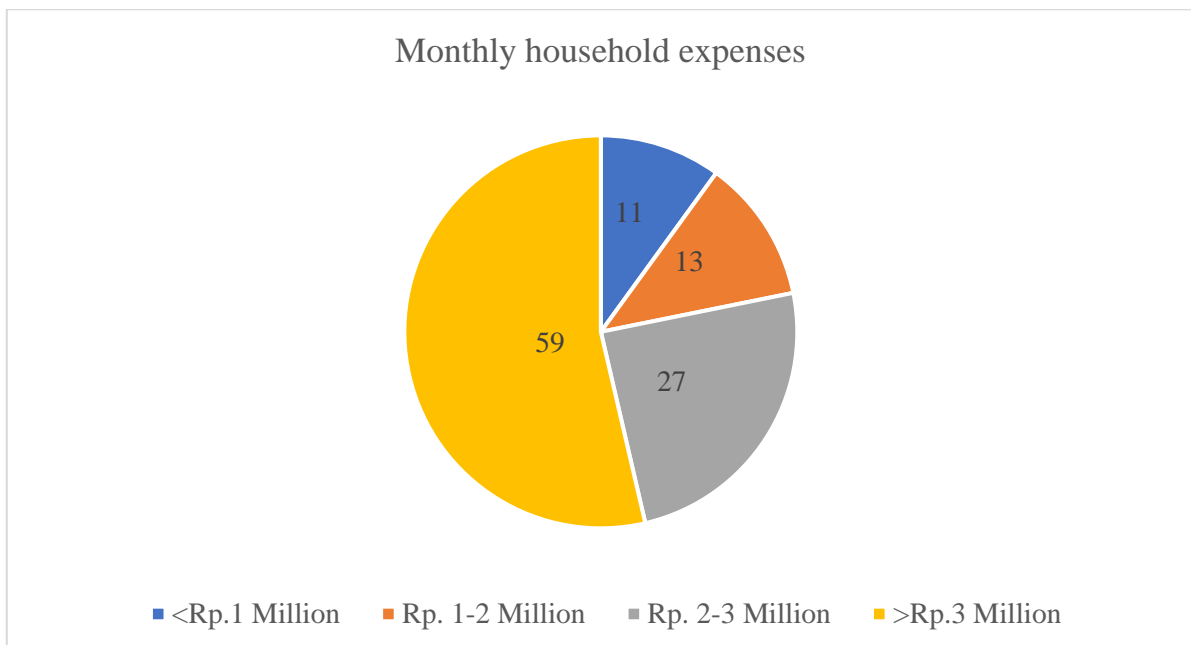


Fig. 6. Total Monthly Expenses

It can be seen from the economic status reflected in spending, showing that spending above 3 million per month has respondents with 59 people or 53.6%. In stark contrast to respondents who have

expenditures of around 1-2 million and less than 1 million, amounting to 13 people or 11.8% and 11 people 10%. Meanwhile, 27 people or 24.5% have expenses of 2-3 million. The largest household expenditure is above 3 million per month due to soaring market needs. The greater the household income, the percentage of expenditure will increase, and vice versa. Therefore, the country's household expenditure increases when the amount of income increases. The distribution of expenditure evenly in each expenditure group shows that the sample obtained in this study is quite heterogeneous.

### 3.2 Quantitative Analysis

The quantitative analysis used in this study includes the Chi-Square test and binary logistic regression. Research including the Chi-Square test was conducted to determine the relationship between Fish Consumption and demographic variables (gender, ethnicity, age group, income per month, education level and occupation). From the results of the Chi-Square test, important variables were selected to be analyzed using appropriate analysis to estimate the relationship between the proximity of important variables to the frequency of fish consumption.

#### 3.2.1 Chi-square Test Results of Fish Consumption with Sex

**Table 1.** Chi-square Test Results of Fish Consumption Relationship with Sex

Chi-Square Tests					
	Value	Df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	4,215	1	,043		
Continuity Correction	,029	1	,865		
Likelihood Ratio	,222	1	,638		
Fisher's Exact Test				,775	,444
Linear-by-Linear Association	,213	1	,644		
N of Valid Cases	110				

From the test results above, it can be seen that the P-Value is 0.043, less than the level of significance ( $\alpha$ ) set so that the decision that can be taken is Reject H0 which means fish consumption is influenced by sex. From the results of interviews with respondents, it was found that the determination of fish eating was indeed determined by respondents who were female where the majority worked as housewives supported by the results of the descriptive analysis above.

#### 3.2.2 Chi-square Test Results of Fish Consumption with Age Group

**Table 2.** Chi-square Test Results of Fish Consumption with Age

Chi-Square Tests			
	Value	Df	Asymptotic Significance (2-sided)
Pearson Chi-Square	8,188	3	,044
Likelihood Ratio	4,149	3	,246
Linear-by-Linear Association	,249	1	,618
N of Valid Cases	110		

From the test results of the table above, it can be seen that the P-Value is 0.044 less than the level of significance ( $\alpha$ ) set so that the decision that can be taken is Reject H<sub>0</sub> which means fish consumption is influenced by Age Group.

### 3.2.3 Chi-square Test Results of Fish Consumption relationship with respondents' occupation

**Table 3.** Chi-square Test Results of Fish Consumption relationship with occupation

Chi-Square Tests			
	Value	Df	Asymptotic Significance (2-sided)
Pearson Chi-Square	17,164	6	,007
Likelihood Ratio	7,612	6	,268
Linear-by-Linear Association	1,820	1	,177
N of Valid Cases	110		

From the test results above, it can be seen that the P-Value is 0.007 less than the level of significance ( $\alpha$ ) set so that the decision that can be taken is Reject H<sub>0</sub> which means fish consumption is influenced by the Type of Work of the Respondent.

### 3.2.4 Chi-square Test Results of Fish Consumption relationship with Tribe

**Table 4.** Chi-square Test Results of Fish Consumption with Tribe

Chi-Square Tests			
	Value	Df	Asymptotic Significance (2-sided)
Pearson Chi-Square	6,108	3	,034
Likelihood Ratio	3,137	3	,224
Linear-by-Linear Association	,219	1	,614
N of Valid Cases	110		

From the test results above, it can be seen that the P-Value is 0.034 less than the level of significance ( $\alpha$ ) set so that the decision that can be taken is Reject H<sub>0</sub> which means fish consumption is influenced by the Tribe.

### 3.2.5 Chi-square Test Results of Fish Consumption with Recent Education

**Table 5.** Chi-square Test Results of Fish Consumption with Education

Chi-Square Tests			
	Value	Df	Asymptotic Significance (2-sided)
Pearson Chi-Square	3,564	3	,014
Likelihood Ratio	3,304	3	,347
Linear-by-Linear Association	,209	1	,648
N of Valid Cases	110		

From the test results above, it can be seen that the P-Value is 0.014 less than the significance level ( $\alpha$ ) set so that the decision that can be taken is Reject H<sub>0</sub> which means fish consumption is influenced by the Last Education Completed by the respondent.



3.2.6 *Chi-square Test Results of Fish Consumption relationship with monthly average expenditure*

From the test results below, it can be seen that the P-Value is 0.007 less than the level of significance ( $\alpha$ ) set so that the decision that can be taken is Reject H0 which means fish consumption is influenced by the average expenditure of respondents in a month.

**Table 6.** Chi-square test results of the relationship between fish consumption and monthly expenditure

Chi-Square Tests			
	Value	Df	Asymptotic Significance (2-sided)
Pearson Chi-Square	12,114	3	,007
Likelihood Ratio	5,196	3	,158
Linear-by-Linear Association	2,083	1	,149
N of Valid Cases	110		

3.2.7 *Results of Binary Logistic Regression Analysis*

To see the variables that influence decisions in fish purchases, binary logistic regression analysis is used with the following model:

$$\ln \left( \frac{P_i}{1-P_i} \right) = \beta_0 + \beta_1 x1i + \beta_2 x2i + \beta_3 x3i + \beta_4 x4i + u_i \quad (1)$$

Note:

- L : logit model (Consumption of eating fish)
- Pi : probability
- $\beta$  : population regression coefficient
- u : random error
- x1 : age range
- x2 : education level
- x3 : expenses per month
- x4 : occupation

**Table 7.** Results and models of binary logistic regression calculations

Variables in the Equation									
		B	S.E.	Wald	Df	Sig.	Exp(B)	95% C.I. for EXP(B)	
								Lower	Upper
Step 1a	Age Group	,237	,266	,795	1	,037	1,267	,753	2,133
	Education	,058	,349	,028	1	,048	1,060	,535	2,101
	KLP Jobs	,166	,151	1,209	1	,021	1,180	,878	1,586
	KLP Expenditure	-,395	,322	1,508	1	,019	,674	,359	1,265
	Constant	-1,714	1,605	1,141	1	,025	,180		

$$\ln \left( \frac{P_i}{1-P_i} \right) = -1.714 + 0.237*Age + 0.058*Education + 0.166*Occupation - 0.395*Expenses \quad (1)$$

From the results above, it is known that each increase in age will increase the desire to eat fish by 0.237 times, or people who are older will have a desire to eat fish 1.267 times greater than the younger level, the level of education increases the desire to eat fish by 0.058 if or people with a high level of education are 1,060 times more likely to consume fish. For work increase the desire to eat fish by 0.166 times or a person's job affects the desire to eat fish by 1.180. A person's expenditure

reduces the desire to eat fish by 0.395, meaning that based on income, a person's desire to eat fish decreases by 0.674 times. From the table above / it can also be seen that all variables have a real influence on the decision to eat fish partially seen from the sig value. Less than the specified p-value of 0.05. So each variable influences the decision to eat fish partially.

Next, the Hosmer-Lemeshow Chi-Square test was carried out to see if the above model adequately explained the factors that influence the desire to eat fish. Here are the results of the Hosmer-Lemeshow test.

**Table 8.** Hosmer-Lemeshow Chi-Square Test

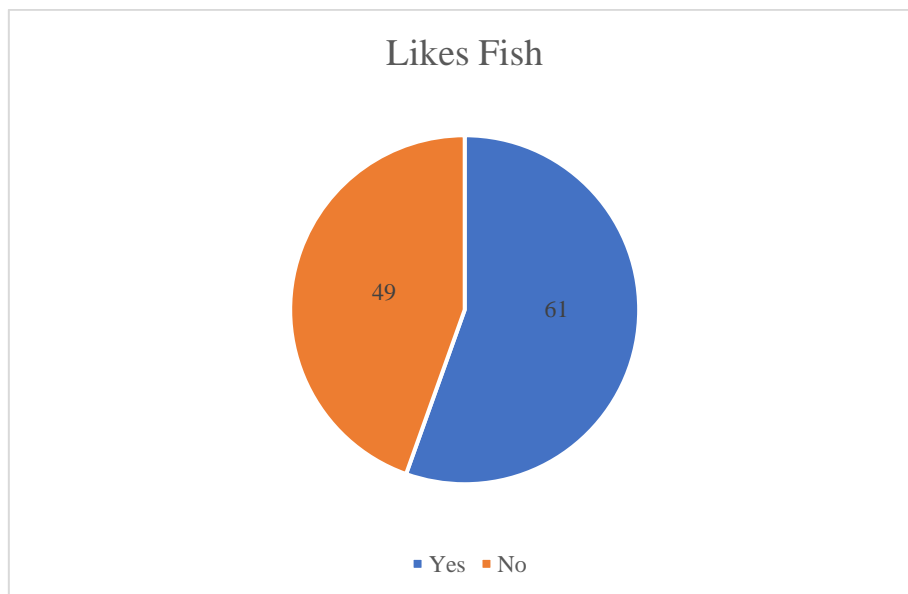
Hosmer and Lemeshow Test			
Step	Chi-square	Df	Sig.
1	6,035	8	,643

Based on the test results above, it is known that the P-Value which is 0.643 is greater than  $\alpha = 0.05$ , then the decision taken is Fail to Reject H0 which means that the model made is sufficient to explain the data in this study.

### 3.3 Conditions of fish consumption in the community

From the results of interviews with several housewives who are at home with low fish consumption. Respondents who are housewives explained that their families rarely eat fish and prefer other protein sources that are easy to process and like such as beef and chicken.

The results of the analysis found that the majority of respondents liked to eat fish, which was 61 people or 55.5%, the remaining 49 people or 44.5% did not like fish for various reasons including allergies and did not like the fishy smell of fish. The incidence of fish food allergy is also explained by Yolanda Candra et.al (2011) in her research on allergy cases where 49% of people experience allergies to eating fish, 24% of which are seafood, namely shrimp, and in interviews I conducted, respondents who have allergies also claimed to be careful in processing fish.



**Fig. 7.** Number of Respondents love fish

Researchers also found that fish consumption in Bekasi Regency in the last month was at the lower middle level, namely 49 people or 44.5% consumed fish 6-11 times. If on average only two to three times a week Bekasi Regency residents eat fish or other processed fish, this is because some things include many who eat fish just for side dishes so they don't get bored.

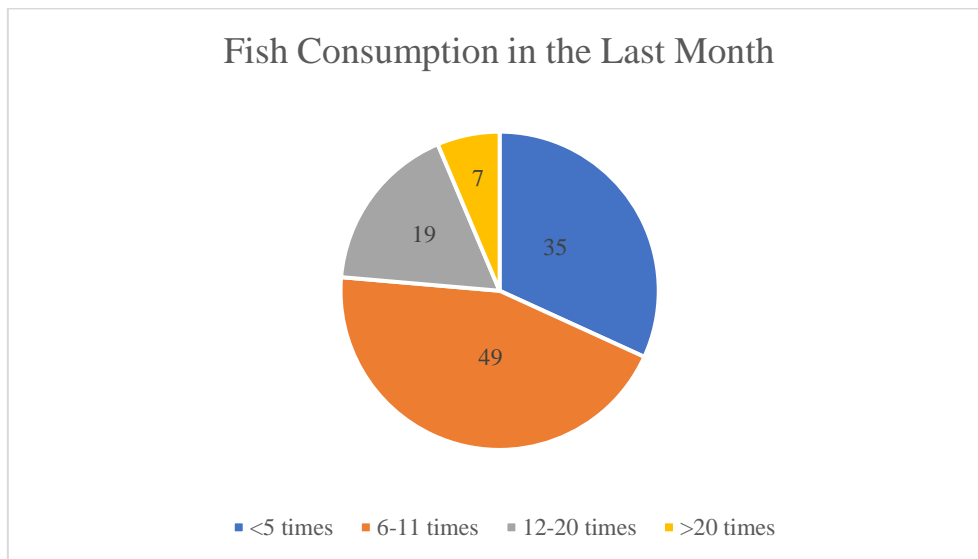


Fig. 8. Number of respondents consumed fish in the past month

The most popular consumption fish by Bekasi Regency respondents are fresh seawater fish and fresh freshwater fish have always been the choice of the people of Bekasi Regency. The type of fresh fish selected by 110 respondents consisted of 78 people or 70.9% of seawater fresh fish, while 27 people or 24.5% of freshwater fresh fish and 5 people or 4.5% liked processed fish.

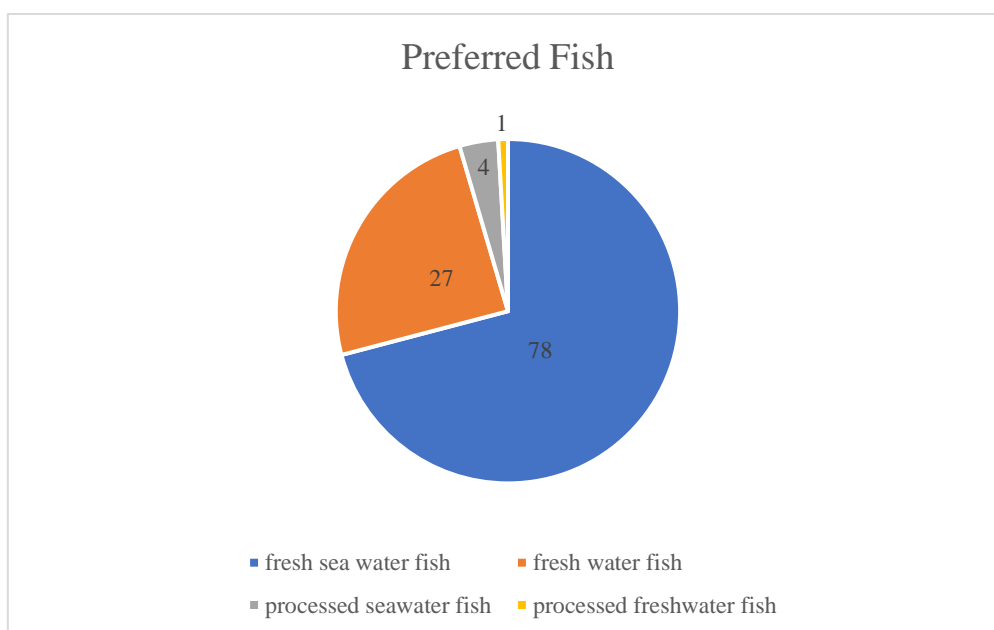


Fig. 9. Number of Preferred fish Respondents

## 4 Conclusion

The choice of fish as a source of animal protein consumed by the people of Bekasi Regency shows the consumption pattern of fresh fish, both freshwater fish and sea water fish, based on frequency, the consumption pattern is included in the large category, namely 70.9% fresh sea water fish and 24.5% fresh fish freshwater. The Bekasi Regency community's perception of fish is that they are always interested in fresh fish. Most respondents, more than 44.5%, consumed fish 6-11 times. The respondent's perception is that they already know that fish nutrition is good for health.

The author recommends that: (1) The government should continue to hold promotional activities on an ongoing basis, such as holding stands for processed fish products to create MSMEs for local communities; (2) The government should continue to campaign and provide regular insight into the nutritional and protein content of fish to the public, especially to housewives because they are the ones who determine the family's cooking; and (3) Participate in training and education for fishermen, cultivators and MSME actors in processed fish products.

## References

- [1] Annur, C. M. (2022). MMAF: Indonesia's Fish Consumption Rate Reaches 55.37 Kg per Capita in 2021. Downloaded October 25, 2022, from the World Wide Web site: <https://databoks.katadata.co.id/datapublish/2022/06/23/kkp-angka-konsumsi-ikan-ri-capai-5537-kg-per-kapita-pada-2021>
- [2] Candra, Y., Setiarni, A. and Rengganis, I. (2011). Overview of sensitivity to food allergens. Depok: Undergraduate Program, Faculty of Public Health, University of Indonesia. Makara Health Journal, Vol. 15, No. 1, 44-50.
- [3] DJPDSKP, KKP. (2020). KKP Invites Mothers to Ensure Fish at the Family Dining Table. Downloaded April 26, 2021, from the World Web site: <https://kkp.go.id/djpdspkp/artikel/23520-kkp-ajak-ibu-ibu-pastikan-ikan-di-meja-makan-keluarga>
- [4] Purwanto, A. (2021). The Largest Industrial Estate in Southeast Asia and the Buffer of DKI Jakarta. Downloaded April 13, 2022, from the World Wide Web site: <https://kompaspedia.kompas.id/baca/profil/daerah/kabupaten-bekasi-kawasan-industri-terbesar-di-asia-tenggara-dan-penyangga-dki-jakarta>
- [5] Surjaya, A. M. (2019). Still Below the National Limit, 23,184 Toddlers in Bekasi Suffer from Stunting. Downloaded July 8, 2021, from the World Wide Web site: <https://metro.sindonews.com/berita/1465646/171/masih-di-bawah-batas-nasional-23184-balita-di-bekasi-derita-stunting>