

# Consumer's valuation of the traditional fish handling practices using importance-performance analysis

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**Abstract.** Fishery products, especially fish, have special characteristics on the diversity of species, inconsistent supplies, and short shelf-life. Most of the businesses in the fishery sector in Indonesia are still running using traditional methods. Lack of infrastructure and knowledge of Good Handling Practices (GHP) in fish, resulted in the decreasing of quality and often losses. This research tries to explore perception and consumer appraisal of fresh fish products to fishery business practices in Indonesia, especially in the coastal area of Yogyakarta. By using Importance-Performance Analysis (IPA) tools, we can measure the relationship between consumer perceptions with the priority of improvement that should be done. The method of this research is by using a questionnaire, where the questionnaire that has been valid and reliable (level of confidence 95%) then distributed to 101 respondents (fresh fish consumers). Based on the data processing, we got result that there are 3 attributes that enter in Quadrant I that is existence of garbage near market area, the hygiene of display table, and existence of dirty water puddle. The attributes included in Quadrant I indicate that these attributes are given the highest priority of improvement according to the consumer.

## 1. Introduction

Fishery is one of agriculture sub-sectors that play an important role in economic growth of Indonesian society. Based on data from BPS that is processed in [1], mentioned that fishery sub-sector holds the second largest contribution after the food crop sub-sector. This is triggered by increased consumption of fresh fish and processed fish products. According to BPS observation data from 2013-2014, there was an increase in fish supply coupled with an increase in fish consumption by 8.44% and 8.32%. Province that experienced the highest increase of fish consumption is Special Region of Yogyakarta with increasing value 30,96%. One of the factors that causes the increase in fish consumption is the support from the government both in the form of campaigns and events about fond of eating fish to the community.

The potency in supply and demand of fishery products is unfortunately not balanced with the quality of handling. According to [2], the handling of inappropriate fishery products is the main cause of the declining quality of fresh fish products that are often under the established requirements. Fresh fish products that are often found in the market are mostly handled with traditional and simple techniques. Environmental conditions around the place of fish seller were still less awake hygiene. Juwitaningtyas [2] also mentioned that the practice of handling fish that takes place in traditional



markets is below the standard where found in fresh fish found microbial contamination that exceeds the threshold, breakdown of cold chain system, and minimum sanitation. Therefore, to ensure the ongoing food security system to consumers, this study aims to measure consumer ratings of traditional fish handling practices so that the priority of improvement on any problems that arise can be done.

## 2. Materials and methods

This study uses an analysis of *Importance-Performance Analysis* (IPA) to interpret consumer assessment and give priority to the improvement of quality attributes based on consumer ratings. IPA is a tool in marketing science that is used to measure the level of customer satisfaction on the quality attributes of an item of goods or services. This tool brings consumer judgment on the performance of items of goods / services to the level of importance attributes contained in the item. This method is generally an easy tool to apply in a variety of interests in order to improve the marketing performance as well as decision making improvements to the required quality attributes [3-8].

Therefore, this study involved respondents who are fish consumers in Fish Market of Depok Beach, Yogyakarta. The following steps are taken in this research:

- 1) Creating an initial questionnaire distributed to 35 respondents.
- 2) Testing the validity and reliability of the initial questionnaire. Validity and reliability test is performed on the initial questionnaire to determine the questionnaire's ability as a valid and reliable measurement tool. A valid item is an item that has a value of  $r_{\text{calc}} > r_{\text{table}}$ , where  $r_{\text{calc}}$  is derived from equation (1).

$$r = \frac{\left( n \sum_{i=1}^n X_i Y_i \right) - \left( \sum_{i=1}^n X_i \right) \left( \sum_{i=1}^n Y_i \right)}{\left( \sqrt{n \sum_{i=1}^n X_i^2 - \left( \sum_{i=1}^n X_i \right)^2} \right) \left( \sqrt{n \sum_{i=1}^n Y_i^2 - \left( \sum_{i=1}^n Y_i \right)^2} \right)} \quad (1)$$

- 3) The reliable items are items that have Cronbach's alpha  $> r_{\text{table}}$  values. This reliability test can be done by using Spearman-Brown formula as shown in equation (2).

$$r_i = \frac{2(rb)}{1+rb} \quad (2)$$

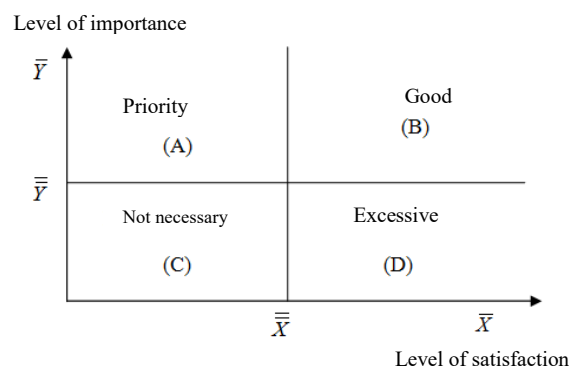
- 4) Calculates the adequacy of the sample size. The sample required for this study was calculated using a 95% confidence level and error rate of 0.1 using equation (3).

$$n = p(1 - p) \left[ \frac{Z_{\alpha/2}}{E} \right]^2 \quad (3)$$

- 5) Creating final questionnaires distributed to 101 respondents. The final questionnaire distributed is a selection of validity and reliability test results so that 13 questions are obtained.
- 6) Analyze satisfaction test and interest test. This analysis is done by calculating the average value of each attribute and then calculating the average of the overall value of satisfaction level and importance level. The formula used to calculate such averages is:

$$\overline{Xi} = \frac{\sum_{i=1}^k \overline{Xi}}{n} \quad \text{and} \quad \overline{Yi} = \frac{\sum_{i=1}^k \overline{Yi}}{n} \quad (4)$$

- 7) Creating IPA Quadrant. The IPA quadrant is a quadrant constructed from Cartesian diagrams divided into 4 areas as shown in figure 1.



**Figure 1.** The theory of IPA diagram.

The average value of degree of importance and degree of satisfaction calculated based on the results in step 5 becomes the coordinate point which is then plotted on the quadrant.

### 3. Result and discussion

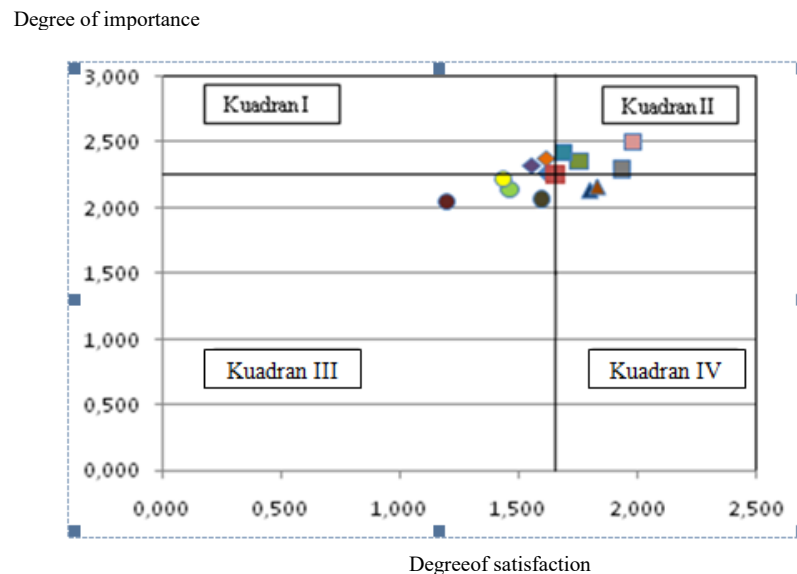
Based on the value of the validity and reliability test results of all questions that include the attribute of satisfaction / interest and performance attributes on the questionnaire, obtained the result that there are 13 items that meet the valid and reliable criteria with the value of  $r_{\text{calc}} > r_{\text{table}}$  and the value of Cronbach's alpha  $> r_{\text{table}}$ . The final questionnaire was distributed to 101 respondents to assess the level of importance / satisfaction and satisfaction attributes, with the results shown in table 1.

**Table 1.** The questionnaire result of level of important / satisfaction assessment.

Code	Attributes	Average satisfaction	Average interest
Q1	Fish eyes are clear and fresh color	1,800	2,136
Q2	The fish' gill are fresh red	1,827	2,164
Q3	There is no bad odor	1,982	2,500
Q4	Fish meat is not slimy	1,936	2,291
Q5	Comparison of the use of ice is 1 Kg ice for 1 Kg fish (to keep the freshness of the fish)	1,464	2,136
Q6	The display tables are clean	1,555	2,327
Q7	The market floor does not look seedy	1,436	2,218
Q8	There is no stagnant water	1,618	2,264
Q9	No garbage piling near the sales area	1,618	2,382
Q10	There is a sufficient supply of clean water	1,755	2,355
Q11	Merchants use clean clothes	1,600	2,064
Q12	Merchants use gloves while serving purchase	1,200	2,045
Q13	Fish storage containers are clean	1,691	2,418

Based on the value of each attribute in the table above, then calculated the average value and obtained the result that is  $\bar{\bar{X}}i = 1.652$  (degree of importance) and  $\bar{\bar{Y}}i = 2,254$  (degree of satisfaction). The point  $(\bar{\bar{X}}i, \bar{\bar{Y}}i)$  becomes the point of intersection on the Cartesian diagram which then becomes the

dividing point of the plotting area (Quadrant I, Quadrant II, Quadrant III, and Quadrant IV). The pair of degree of importance and degree of satisfaction on each attribute becomes the coordinate point (X1, Y1; X2, Y2; ..... X13, Y13). All these points are then plotted in Cartesian diagrams that are spread across the areas of Quadrant I up to Quadrant IV (figure 2).



**Figure 2.** Data spread in IPA diagram.

Based on the results of plotting on Quadrant Importance-Performance Analysis (IPA) above obtained the result that:

- 1) Attributes that are in Quadrant I are the presence of garbage near the market area, display table hygiene, and the presence of stagnant water. Attributes spread in Quadrant I fall into the priority category for immediate correction.
- 2) Attributes that are in Quadrant II are the sensory assessment of fish are the odor and appearance of fish skin, clean water supply, and cleanliness of fish storage container. Attributes that occupy in Quadrant II means attributes that have shown good performance so that has met the expectations and customer satisfaction.
- 3) Attributes that are in Quadrant III are attributes of the use of ice to maintain freshness of fish, fish market floor conditions, and personal hygiene of traders that is related to clothing and the use of gloves. Attributes that are in Quadrant III mean that the attributes are actually considered not too important by consumers but has shown good performance.
- 4) Attributes that are in Quadrant IV are attributes related to the product directly in the form of assessment of the eye and fish gills. Attributes that fall into this category have been considered good by consumers and the improvement will be felt to be excessive.

#### 4. Conclusion

Based on the research on consumer's assessment of traditional fish handling practices in Depok Fish Market which analyzed using *Importance-Performance Analysis* (IPA) method, it is concluded that consumers feel the environmental hygiene factor in the market area is very necessary to be improved. The quality attribute concerning the quality of the direct product (fresh fish) is considered good and meets the expectations and satisfaction of the consumers.

## References

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