

ANALYSIS OF HANDLING OF CATCH RESULTS ON THE QUALITY OF MACKEREL SCAD (*Decapterus macarellus*) USING ORGANOLEPTIC TECHNIQUES IN SIBOLGA MODERN FISH MARKET

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ABSTRACT

Activities, including landing, processing, marketing, logistics, vessel and gear maintenance, and mooring. Organoleptic testing assesses fish quality based on sensory characteristics, including color, texture, odor, and the freshness of the eyes and gills. This test is conducted by panelists using a specific assessment scale. The objectives of this study were: 1) to analyze the handling process of mackerel after catching and until auction at the Sibolga Modern Fish Market; 2) to assess the quality of mackerel using organoleptic testing. A survey approach was used. A total of 66 people and one informant participated. The research results show that the blue scad (*Decapterus macarellus*) handling process begins with unloading, transport to the weighing area, weighing and recording, cooling after weighing, sorting before auction, auction at TPI, distribution after auction, and transportation to the market. Based on the organoleptic test sheet evaluation of 66 traders of blue scad (*Decapterus macarellus*), a comparison of fish quality categories was found in two obtaining areas. The quality of the fish declined throughout the afternoon and evening, with traders in the outer area (50) receiving a score sheet of 6 (quite fresh) and traders in the inner section (16) receiving a score sheet of 7 (fresh), indicating a decline in fish quality. The catch at PPN Sibolga was handled in accordance with KKP regulations, including sorting the fish by size and type, washing them with clean water, cooling them with ice, and offloading them swiftly and carefully.

Keywords: Organoleptic, Quality, Market, Fish Handling

1. INTRODUCTION

Mangrove Sibolga is a coastal city in the western region of Sumatra Island, covering an area of approximately 10.77 km², equivalent to 107,700 ha, encompassing 88,900 ha of land and 18,800 ha of island territory¹. Due to its strategic geographic location, the capture fisheries sector is a key economic pillar for the community, particularly fishermen and fisheries businesses. The landing process involves vessel reporting, fish unloading, quality inspection, sorting, volume recording, and distribution to fish auction

sites². Afterward, the scad is distributed through four main channels: directly to collectors, local retailers, wholesalers, or retailers outside the region³.

Fish quality is highly dependent on post-catch handling techniques, including washing with clean water, proper sorting, storage on ice at the appropriate ratio, and transportation using a cold chain system⁴. Mackerel sold at the Sibolga Modern Fish Market exhibits quality variations due to different storage methods, ranging from ice use to no special treatment at ambient temperature. Deterioration in fish quality

can be quickly identified through organoleptic testing, which is an assessment method based on the appearance, odor, texture, and elasticity of the fish flesh⁵.

Fish quality refers to the levels of freshness, safety, and suitability for consumption. Assessment is based on its physical condition, chemical content, and the presence of bacteria, to ensure the fish is safe to eat and meets established standards. Fish quality is a crucial aspect in the fisheries sector, especially for consumers and businesses. Several factors that can influence fish quality include post-catch handling, storage temperature, and preservation techniques⁶.

The blue scad (*Decapterus macarellus*) is a small pelagic fish species widely distributed in Indonesian waters, including in the Sibolga region. Scad has significant economic value and is a staple food for the community. Priyambodo et al.⁷ stated that scad is rich in nutrients, including protein, omega-3 fatty acids, and minerals, which are beneficial for human health. Samiaji⁸ stated that scad is a small pelagic fish that has economic value and is abundant in Indonesian waters. The blue scad is a dominant species with a wide distribution area, found in almost all waters⁹.

Catch handling plays a crucial role in determining the quality and shelf life of fish after catching. Santoso & Widodo¹⁰ state that catch handling is a series of activities carried out to maintain the freshness of fish from the moment it is caught until it reaches the consumer. These activities include cleaning, cooling, storage, and transportation, to prevent damage caused by microorganisms and enzymes present in the fish.

Organoleptic is a method of assessing fish quality based on sensory characteristics, such as color, texture, odour, and the freshness of the eyes and gills. This test is conducted by panelists using a specific assessment scale. According to Wahyu et al.¹¹, organoleptic or sensory testing is an important method in assessing fish quality by using human senses to evaluate physical

aspects, texture, and aroma. Organoleptic testing plays a role in early detection of quality problems because it is fast and accurate. Although subjective, sensory assessment is often sharper than other measurement tools, so an assessment sheet¹¹ is recommended. Organoleptic testing is important for identifying quality decline, signs of rotting, and damage in fish.

Based on these issues, this study aims to examine the handling methods of mackerel used by traders at the Sibolga Modern Fish Market and evaluate their quality through organoleptic testing. The results of this study can contribute to improving the quality and safety of fish consumption, provide policy input for local governments, and serve as an academic reference for developing more hygienic and sustainable catch handling.

2. RESEARCH METHOD

Time and Place

This research was conducted at the Sibolga Modern Fish Market from May to June 2025.

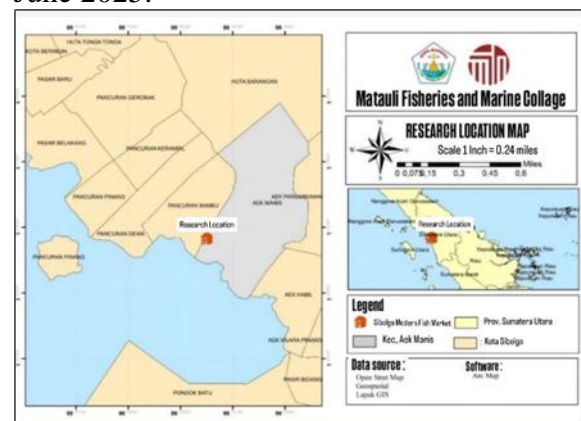


Figure 1. Research location map

Method

This research method uses a survey approach, namely direct field observations to obtain samples and interviews with relevant parties. According to Hasnunidah¹², the survey method is a research approach that involves selecting a sample from a population and using questionnaires and interviews to collect the necessary data. Adawyah¹³ states that organoleptic assessment results must be scored. This

average score is then used to classify the quality of fish freshness. Typically, assessment guidelines or standards are used, as outlined in the Indonesian National Standard (SNI). The formula for organoleptic fish quality is as follows:

$$SR = \frac{\sum S}{P}$$

Description:

SR = Average fish quality score

ΣS = Total number of organoleptic scores assessed

P = Number of organoleptic parameters assessed

After all the data were collected, they were analyzed descriptively to provide a comprehensive representation of their characteristics, including trend patterns, value distributions, and the frequency of

each studied variable¹⁴. This approach allows data to be presented in a coherent and informative manner, making it easier for researchers to interpret the factual conditions found in the field.

Interpretation of Organoleptic Test Results

Score 9-7 → Fish is very fresh and suitable for sale and consumption; 6-5 → Fish is still edible, but not in prime condition; ≤ 4 → Fish is not suitable for consumption and should be discarded or not sold. Therefore, organoleptic testing is crucial for maintaining the quality of mackerel sold in Modern Fish Markets. By conducting tests based on sight, smell, and touch, traders and consumers can ensure the fish is fresh, safe, and of high quality before consumption.

Table 1. Organoleptic test parameters

Skor	Eye	Gill	Scales/Skin Color	Meat	Mucus	
1	Deep concave, crushed	Black	Very pale/damaged	Destroyed	Very thick, stinky smell	
2	Deflated cornea	opaque Dark chocolate	Totally dull, lots of scales missing	Very soft	Thick, foul smell	
3	Very milky cornea	concave, white	Dark chocolate	Totally dull, lots of scales missing	Mushy	Thick, cloudy, sour smell
4	Sunken, cloudy cornea	cloudy Grayish brown	Grayish brown	Dull pale, many loose sides	Soft on the surface	Thick, cloudy, starting to smell
5	Flat, cloudy pupils	cloudy Tanned	Tanned	Dull, scales come off easily	Less elastic	Thick, cloudy
6	Flat. Pupils are starting to turn gray.	Pupils are starting to turn gray.	Pale red to brown	Dull, some scales are starting to come off	Somewhat elastic	Thin, cloudy
7	Convex cloudy	slightly Pale red	Pale red	Dull but still natural, scales attached	Elastis	Thin, slightly cloudy
8	Clear, slightly bright	convex, less bright	Bright red, slightly reduced in brightness	Natural bright, scales adhere well	Solid elastic	Thin, almost transparent
9	Very convex, transparent cornea	clear, Fresh	bright red	Natural bright color, scales firmly attached	Very elastic, dense	Thin transparent

Table 1 is a guideline for organoleptic assessment of fish freshness based on its physical characteristics. Assessments are based on several key parameters: eyes, gills,

scales or skin color, flesh, and mucus, using a score of 1 to 9. Lower scores indicate damaged or rotten fish, while higher scores indicate fresh, good-quality fish. Overall, the

higher the score for each parameter, the fresher the fish. This assessment is conducted systematically using the senses of sight, smell, and touch to obtain objective, accurate results for fish quality evaluation.

3. RESULT AND DISCUSSION

Fish Handling Activities at the Sibolga Nusantara Fisheries Port (PPN)

Fish handling activities at the Sibolga PPN are carried out after the catch is unloaded. The loading and unloading process at this port generally follows a systematic approach to maintain good fish quality and ensure efficient operations. These stages include vessel arrival, document inspection, fish quality checks, unloading, post-harvest handling, temporary storage, recording, distribution, area cleaning, vessel maintenance, final report preparation, and catch reporting. These loading and unloading activities are carried out at the Sibolga PPN's hygienic fish auction site (TPI), typically starting around 8:30 a.m. and continuing through the end of the day.

The process of transferring fish from the vessel to the dock is carried out manually using tools such as fish baskets, pulleys, and

conveyors. A hygienic Fish Auction Site (TPI) is not limited to the technical aspects of fish handling but is also closely linked to the supply chain and consumer trust in fishery products. Fazri & Solihin¹⁵ define TPI as a functional facility in a fishing port, close to other interconnected facilities.

Fish Unloading Process Stages

The catch landed at the Sibolga Port consists of pelagic fish, including skipjack tuna, blue mackerel, and several other species. These fish are unloaded intact and directly from the vessel to the port. The quality of blue mackerel can be maintained if the post-catch handling process on board applies the 4C principle: clean, cool, quick, and careful. Unloaded fish are generally kept chilled at around 0–2°C, which slows the growth of microorganisms and the rate of quality degradation. According to Nurhalimah & Fadillah¹⁶, proper handling must begin on board the vessel, including washing the fish immediately after catch and storing them at low temperatures using ice. This practice is crucial for maintaining the fish's freshness and preventing physical and biological damage during distribution.

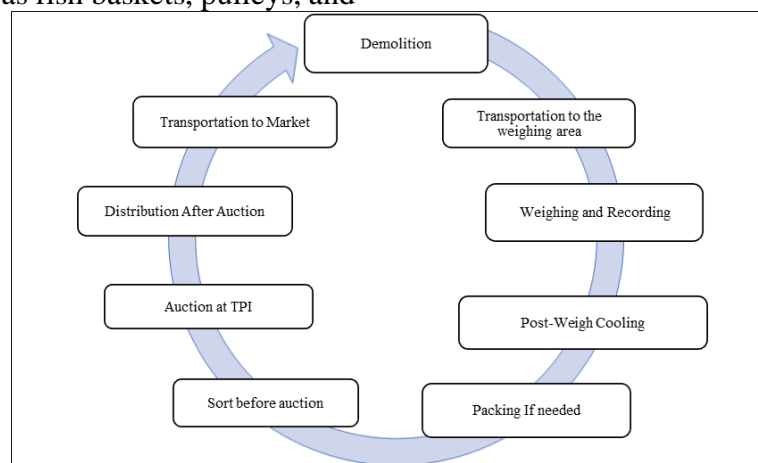


Figure 2. Flowchart of the handling process at the Fish Auction Place (TPI)

The unloading process is carried out after the ship docks at the pier. Blue mackerel is removed from the ship's hold manually using tools such as fish baskets or blongs, pulleys, and conveyors. The fish placed in the baskets/blongs are transported to the weighing area by workers assigned to

the Hygienic TPI. The fish are weighed and recorded on the weighing ticket by the weigher, with the weight and type of each fish noted. After the fish are weighed, they can be placed on ice to maintain their quality. Packing uses a cooling/preservative material in the form of ice, but not all fish

caught are packed. Packing is carried out solely by fishermen as a fish storage activity. This fish storage activity depends on the length of the trip/marketing area and the type of fish. If the marketing area is closed, the fish are loaded immediately because their quality is still good.

Organoleptic Testing of the Quality of Blue Scad Sold at the Sibolga Modern Fish Market

Organoleptic testing was conducted on 66 blue scad traders from different locations at the Sibolga Modern Fish Market, which focuses on high-value commodities. The fish were sourced from the government-managed Sibolga PPN (VAT Office), and data on fish traders were collected through interviews and direct observation at the Sibolga Modern Fish Market. Observations focused on fish quality parameters, including eyes, gills, mucus, odor, skin, flesh, and flesh firmness, using an organoleptic assessment guide.

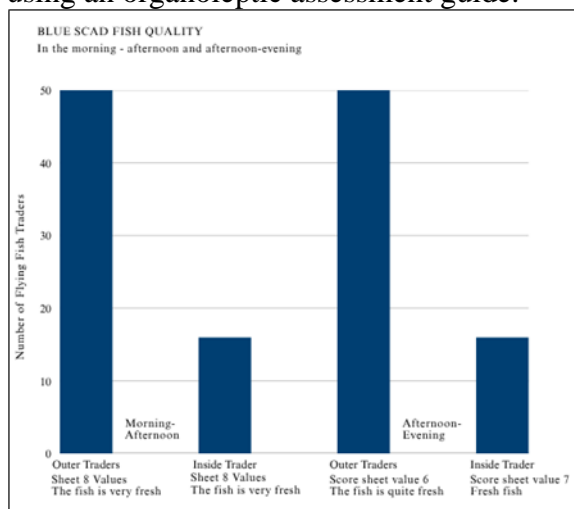


Figure 2. Quality of blue scad

Based on the results of the assessment using an organoleptic test sheet on 66 blue mackerel traders at the Sibolga Modern Fish Market, a comparison of fish quality categories was obtained in two observation time periods, namely morning-afternoon and afternoon-evening, taking into account the differences in the location of traders in the outer and inner parts of the market. During the morning-afternoon assessment, both traders in the outer (50 traders) and in the

inner (16 traders) groups obtained a score sheet value of 8, which is categorized as very fresh fish.

This condition indicates that the quality of fish in the morning to afternoon is at an optimal level, influenced by proper handling, maintaining low temperatures with ice, and the absence of high solar heat. Furthermore, during the afternoon assessment, there was a decline in fish quality. Traders in the outer part (50 traders) obtained a score sheet value of 6, which is categorized as slightly fresh fish, while traders in the inner part (16 traders) obtained a score sheet value of 7 or the fresh fish category. Fish quality tends to decline.

Direct observations and interviews with traders at the Sibolga Modern Fish Market indicate that sanitation standards and fish-handling procedures are optimally implemented. This market is designed for the buying and selling of marine fish products. The application of sanitation and hygiene principles in the fish handling chain plays a crucial role in maintaining product quality and safety. Failure to comply with these principles can encourage the proliferation of pathogenic microorganisms, thereby accelerating decomposition. Maulana et al.¹⁷ emphasized that fish quality is highly dependent on storage conditions, with storage without refrigeration accelerating the deterioration of protein and fat compounds, thereby directly impacting the product's texture, taste, and safety.

4. CONCLUSION

The main conclusion of this study is that the catch handling at the Sibolga Fish Farming Center (PPN) is carried out in accordance with the Ministry of Maritime Affairs and Fisheries guidelines, which include rapid and careful unloading of fish, sorting by type and size, washing with clean, potable water, and cooling with ice at an appropriate ratio to fish weight. The entire process takes place in a hygienic and protected area to prevent contamination, with fish stored in closed containers. The organoleptic assessment of 66 blue mackerel

traders at the Sibolga Modern Fish Market (MSM) showed that fish quality during the morning-afternoon period was categorized as "very fresh" (score sheet score of 8) both outside and inside the market. This indicates optimal conditions due to proper post-harvest handling, maintaining low temperatures with ice, and minimal exposure

to sunlight. However, during the mid-afternoon period, quality decreased, with traders outside the market receiving a 6 (somewhat fresh) and those inside receiving a 7 (fresh). This decline is due to melting ice at ambient temperatures, increased exposure to open air and sunlight, and limited cooling facilities.

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