Fisheries Journal, 16 (2), 794-805 (2026)
http://doi.org/10.29303/jp.v16i2.2112

QUALITY MANAGEMENT AND FOOD SAFETY OF FROZEN FISH AT PT. MARITIM TIMUR PERKASA, KUPANG CITY, EAST NUSA TENGGARA

Manajemen Mutu Dan Keamanan Pangan Ikan Demersal Beku di PT. Maritim Timur Perkasa, Kota Kupang, Nusa Tenggara Timur

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(Received January 8th 2026; Accepted February 24th 2026)

ABSTRACT

This study aims to describe the quality management system and food safety practices applied in the frozen demersal fish production process at PT Maritim Timur Perkasa. The research was conducted over a three-month period, from September to November 2025. A qualitative research method was employed through observation, interviews, and document review. The collected data were analyzed using descriptive analysis techniques. The results indicate that the processing stages of frozen demersal fish at PT Maritim Timur Perkasa generally comply with national standards; however, the gutting stage is not performed. Furthermore, the implementation of GMP and SSOP at PT Maritim Timur Perkasa has generally met the applicable standards, with 17 out of 18 GMP aspects being implemented, while all 8 SSOP aspects have been fully implemented. Nevertheless, several constraints related to quality management and food safety practices at PT Maritim Timur Perkasa still require improvement, including the absence of the gutting stage, some organoleptic parameters of raw materials being within a moderate range, incomplete product labeling, and limited specific laboratory testing for demersal fish.

Keywords: GMP, Frozen Fish, SSOP

ABSTRAK

Penelitian ini bertujuan untuk mendeskripsikan sistem manajemen mutu dan praktik keamanan pangan yang diterapkan pada proses produksi ikan demersal beku di PT. Maritim Perkasa. Penelitian ini dilaksanakan selama tiga bulan, sejak Septemeber hingga November tahun 2025. Penelitian ini menggunakan metode kualitatif melalui observasi, wawancara, dan studi dokumen. Data yang telah dikumpulkan kemudian dianalisis menggunakan teknik analisis deskriptif. Adapun hasil penelitian menunjukkan bahwa tahap pengolahan ikan demersal beku di PT. Maritim Timur Pekrasa mengacu pada standar nasional, namun tidak melalui tahapan

penyiangan. Selain itu, penerapan GMP dan SSOP di PT. Maritim secara umum telah memenuhi standar sesuai dengan ketentuan yang berlaku, yaitu terdapat 17 dari 18 aspek GMP yang telah diterapkan, sedangkan delapan aspek SSOP seluruhnya telah diterapkan. Terdapat beberapa kendala berkaitan dengan aspek manajemen mutu dan keamanan pangan di PT. Maritim Timur Perkasa yang masih perlu diperkuat, diantaranya: Tidak dilakukannya tahap penyiangan, beberapa parameter organoleptik bahan baku berada pada kisaran sedang, pelabelan produk masih belum lengkap, dan keterbatasan pengujian laboratorium spesifik pada ikan demersal.
Kata Kunci: GMP, Ikan beku, SSOP

INTRODUCTION

Demersal fish are a group of fish that live, feed, and settle at the bottom of waters. Their habitats are characterized by bottom substrates such as sand, mud, or coral. Demersal fish have high economic value due to the taste and characteristics of their meat, which are highly sought after by consumers (Alatas *et al*., 2022). Demersal fish meat has characteristics that make it susceptible to quality degradation if not handled properly. In general, demersal fish meat has a dense texture with a high protein content and a relatively high water content, making it an ideal medium for the growth of spoilage microorganisms (Akerina *et al*., 2024). East Nusa Tenggara has potential demersal fish resources.

The fisheries sector in East Nusa Tenggara is a key driver of the regional economy, driven by the development of value-added products such as frozen fish processing. Frozen fish products have broad market prospects (Sholeh *et al*., 2022). Their development as a superior product is influenced by several factors, including compliance with quality and food safety standards (Wagola *et al*., 2024). This standard compliance encompasses aspects of raw material quality, processing stages, and the implementation of SSOP and GMP (Panjaitan *et al*., 2025). Quality and food safety management in the fisheries industry is generally implemented through a systematic approach aimed at ensuring consistent product quality and safety (Ahzani & Tamsil, 2024).

PT. Maritim Timur Perkasa is a subsidiary of PT. Sungai Mas Bahari, which operates in the fisheries production sector, producing frozen fish products consisting of frozen tuna loins and frozen demersal fish. The company was established on August 16, 2023. Its processed products are shipped throughout East Nusa Tenggara and to its parent company in East Java. A study of the implementation of quality management and food safety at PT. Maritim Timur Perkasa is important, as the company is relatively new but already operates in a strategic area as a supplier of fishery raw materials.

The scope of this research is limited to the aspects of raw material acceptance and frozen demersal fish processing, as well as the implementation of Sanitation Standard Operating Procedures (SSOP) and Good Manufacturing Practices (GMP) at PT. Maritim Timur Perkasa. This research aims to describe the quality management system and food safety practices applied in the frozen fish production process at PT. Maritim Timur Perkasa. It is hoped that this research can provide theoretical benefits in enriching scientific studies in the field of quality management and food safety of fishery products, as well as provide practical benefits in the form of descriptions and information regarding quality management and food safety practices in the frozen fish processing industry.

RESEARCH METHODS

This research was conducted over three months, from September to November 2025, at PT. Maritim Timur Perkasa, Kupang City, East Nusa Tenggara. This research used a qualitative

method, a scientific method aimed at understanding social, cultural, and human behavioral phenomena in depth through description, interpretation, and data collection in the form of text, images, or sound (Wulandari *et al*., 2024). The data collection techniques used in this study were:

a. Observation
   Observations at PT. Maritim Timur Perkasa were conducted by participating in production activities, from the arrival of raw materials from the loading and unloading port to the packaging process for frozen fish products.
b. Interview
   Interviews were conducted to gather information regarding the handling and storage process by asking questions to several sources, including production employees, heads of production divisions, production managers, and heads of the Quality Control (QC) division.
c. Document study
   The document study was conducted using photographs and monthly reports of frozen fish production at PT. Maritim Timur Perkasa.

The collected data were then analyzed using qualitative descriptive analysis techniques to describe and illustrate the data obtained. The objects of observation used in this study include the stages of the frozen fish processing process based on SNI 4110:2020, as well as the implementation of basic GMP and SSOP feasibility at PT. Maritim Timur Perkasa Kupang based on Ministerial Regulation No. 17 of 2019. In addition, the implementation of GMP is also reviewed based on the GMP aspects in the research of Dewi *et al*. (2024) and Wagola *et al*. (2024).

RESULTS

Types of Fish Processed at PT. Maritim Timur Perkasa

One of the frozen fish products processed at PT. Maritim Timur Perkasa is demersal fish caught by fishermen at the Tenau Kupang Port. Based on interviews, the monthly processing of fresh fish can reach 4–6 tons. The fresh demersal fish used as raw materials for PT. Maritim Timur Perkasa's products are presented in the following table:

Table 1. Types of fish processed at PT. Maritim Timur Perkasa

No	Fish Names	*Famili*	*Genus*	*Spesies*
Snapper Group				
1	Silver Chair	*Lutjanidae*	*Aphereus*	*Aphareus rutilans*
2	Cumbersome	*Lutjanidae*	*Etelis*	*Etelis carbunculus*
3	Red Angoli	*Lutjanidae*	*Pristipomoides*	*Pristipomoides filamentosus*
4	White Anggoli	*Lutjanidae*	*Pristipomoides*	*Pomoides multidens*
5	Red Snapper	*Lutjanidae*	*Lutjanus*	*Lutjanus malabaricus*
6	Savu Snapper	*Lutjanidae*	*Lutjanus*	*Lutjanus sebae*
Grouper Group				
7	Older sibling	*Labridae*	*Chlorurus*	*Chlorurus bleekeri*
8	Batik Grouper	*Epinephelidae*	*Epinephelus*	*Epinephelus morrhua*
9	Mud Grouper	*Epinephelidae*	*Epinephelus*	*Epinephelus areolatus*
10	Kartang grouper	*Epinephelidae*	*Epinephelus*	*Epinephelus lanceolatus*
11	Oil Grouper	*Serranidae*	*Epinephelus*	*Epinephelus magniscuttis*
12	Sunu Grouper	*Serranidae*	*Plectropomus*	*Plectropornus leopardus*
13	Golden Grouper	*Epinephelidae*	*Saloptia*	*Saloptia powelli*

Other Groups				
14	Kuwe	*Carangidae*	*Caranx*	*Caranx ignobilis*
15	Rice	*Lethrinidae*	*Wattsia*	*Wattsia mossambica*

Frozen Fish Processing Process

Frozen demersal fish processing at PT. Maritim Timur Perkasa refers to SNI 4110:2020 for Frozen Fish, but does not go through a weeding stage or use the whole/round method.

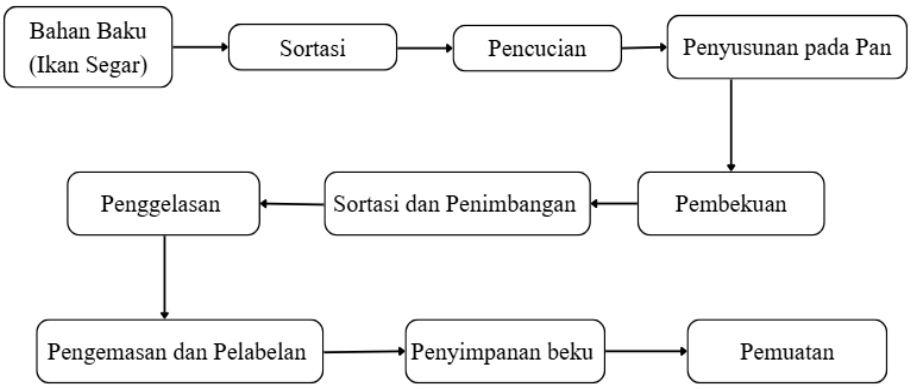

Figure 1. Processing Stages of Frozen Demersal Fish at PT. Maritim Timur Perkasa

Based on Figure 1, the frozen fish processing flow at PT. Maritim Timur Perkasa is as follows:

1. Receipt of Raw Materials

Demersal fish handling at PT. Maritim Timur Perkasa begins with the receipt of fresh fish from PPP Tenau. One employee directly monitors the loading and unloading of the fish. Based on observations, the loading and unloading process is carried out quickly to maintain fish quality and prevent prolonged exposure to sunlight. The fish are then loaded onto the bed of a pickup truck, which has been provided with a mat. Once the stacking is complete, the fish are distributed to the company.

2. Sorting

Fish arriving at the company are then sorted by type, quality, and weight into different baskets. The standard quality of fish received at the company is determined by the condition of the eyes, mucus, odor, flesh texture, and gills. The weight of fish received at the company is sorted based on the company standard, which is a weight above 300 grams. The maximum organoleptic values acceptable at the company are presented in Table 2.

Table 2. Organoleptic Quality of Raw Materials of PT. Maritim Timur Perkasa

Specifications	**Mark**	
Appearance	**Company**	**Standard SNI**
Eyes	6	≥ 7
Gills	5	≥ 7
Body Surface Mucus	7	≥ 7
Odor	5	≥ 7
Texture	7	≥ 7

Based on Table 2., the parameters of body surface mucus and texture each obtained a value of 7, while the parameters of eyes, gills, and odor were each in the range of 5–6. This indicates that the results of the organoleptic assessment of fresh fish received as raw materials

at PT. Maritim Timur Perkasa are still in the range of moderate to good values, so the quality of the fish received is still in the category of fairly fresh and requires further handling. Therefore, the quality characteristics of raw materials still have the potential to be utilized in processing activities with the implementation of the right system.

3. Washing

Fish arriving in the receiving room are then washed using cold chlorine water at a concentration of 50 ppm. They are then transferred to the production room.

4. Arrangement in Pan

In the production room, the fish are arranged in long pans according to their type. The stacking should not extend beyond the sides of the pans to prevent damage or dents. Once arranged, the fish are then placed in the Air Blast Freezer (ABF).

5. Freezing

Fish freezing takes place in the ABF room. At PT. Maritim Timur Perkasa, fish are frozen for 15 hours at –40°C.

6. Sorting and Weighing

After freezing, the fish are sorted by separating them into baskets based on their type and size. The fish are then weighed, weighing 20 kg for each size. PT Maritim Timur Perkasa divides frozen fish into several portions, each based on the type of fish.

7. Glass

After being weighed, the fish are then thawed using cold water and ice. This thawing protects the fish's skin from dehydration and oxidation, which can degrade its quality during frozen storage.

8. Packaging and Labeling

Frozen fish packaging at PT. Maritim Timur Perkasa uses a double packaging technique, namely polyethylene plastic and sacks labeled with information on the company name, production date, type of fish and its size, and net weight.

9. Frozen Storage

The sacks filled with fish are then stored in a cold storage room. Frozen fish is stored at a cold storage temperature of –20°C at PT. Maritim Timur Perkasa.

10. Loading

The fish stored in cold storage is then loaded into 14-ton container trucks. PT. Maritim Timur Perkasa can load the fish once or twice a month. However, during November or December, PT. Maritim Timur Perkasa can load the fish up to three or four times a month. Frozen fish is loaded using the FIFO (First In First Out) method, using forklifts.

GMP Implementation

GMP is a food processing system that aims to maintain the safety and stable quality of food, from the receipt of raw materials to the production of ready-to-consume products (Panjaitan *et al*., 2024). Based on Table 3, the implementation of GMP at PT. Maritim Timur Perkasa has generally met the standards in accordance with Regulation of the Minister of Maritime Affairs and Fisheries No. 17 of 2019. However, product labeling and descriptions do not comply with applicable regulations.

Table 3. Implementation of GMP at PT. Maritim Timur Perkasa

No.	Parameter	Information
1	Location	Appropriate
2	Building	Appropriate
3	Final product	Appropriate

4	Processing machinery and equipment	Appropriate
5	Production materials	Appropriate
6	Employee hygiene	Appropriate
7	Process control	Appropriate
8	Maintenance and sanitation program	Not Appropriate
9	Product labeling and description	Appropriate
10	Documentation and recordkeeping	Appropriate
11	Storage	Appropriate
12	Sanitary facilities	Appropriate
13	Laboratory	Appropriate
14	Packaging	Appropriate
15	Transportation	Appropriate
16	Training	Appropriate
17	Product recall	Appropriate
18	Guideline implementation	Appropriate

The explanation of GMP implementation at PT. Maritim Timur Perkasa is as follows:

1. Location and building

PT. Maritim Timur Perkasa is located near the PPP Tenau Kupang pier, East Nusa Tenggara, far from residential areas. Furthermore, the company's location shortens the distribution distance between fishermen and the company. The company's location has adequate road infrastructure for easy access.

2. Building

PT. Maritim Timur Perkasa has two separate buildings, including an office building and a production building. The production building consists of a raw material receiving room, a production room, a storage room, a refrigeration room, a machine room, and an employee sanitation room. The production building has a good drainage system, both outside and inside the room. The floors in each room in the production building are made of ceramic with an epoxy coating on top, while the walls are made of bricks with waterproof paint. This aims to make it easier for employees to clean the room and reduce contamination in each room. The doors in each room are provided with PVC Strip curtains to prevent pests from entering when opening the room. In addition, the doors in the ABF and Cold Storage rooms are equipped with gaskets that are able to withstand heat transfer. In the raw material receiving room and the production room there are also foot basins filled with water and 100-200 ppm chlorine.

3. Final Product

Before being marketed, frozen fish products at PT. Maritim Timur Perkasa undergo physical testing, such as for damage and final product temperature. However, specific laboratory testing for frozen demersal fish has not yet been conducted.

4. Processing equipment

All processing equipment at PT. Maritim Timur Perkasa uses anti-corrosive, waterproof, non-peeling, rust-resistant materials, and meets food-grade requirements.

5. Production materials

The raw material for frozen demersal fish production comes from the catch of PPP fishermen. Tenau is caught in the Timor Sea and Sawu Sea. Prior to processing, the raw materials undergo an organoleptic inspection to ensure quality and safety.

6. Employee hygiene

Cleanliness and employee hygiene at PT. Maritim Timur Perkasa are strictly maintained. During the production process, employees are prohibited from engaging in activities that risk increasing contamination of frozen fish products, such as wearing jewelry

and watches, rubbing their faces, smoking, leaning on equipment, and spitting indiscriminately.

7. Process control

Process control at PT. Maritim Timur is well-executed. A Quality Control (QC) head is tasked with monitoring all production activities and conducting regular evaluations to ensure product cleanliness and safety. PT. Maritim Timur Perkasa also maintains strict SOPs during production, which are strictly enforced, with sanctions imposed on any employee who violates them.

8. Maintenance and sanitation program for processing facilities

The maintenance and sanitation program for frozen fish processing facilities at PT. Maritim Timur Perkasa is always carried out before and after each production process.

9. Product labeling and description

The labeling on the packaging does not meet the requirements set by the Minister of Health. The information on the label is incomplete and rudimentary. The product description is also incomplete.

10. Documentation and record keeping

Recording of raw materials and final frozen fish products is carried out carefully, including recording the type of fish, weight, date of entry, date of packaging, and supplier code.

11. Storage

Raw materials and finished products are stored separately at PT. Maritim Timur Perkasa in different rooms.

12. Sanitation facilities

The sanitation facilities at PT. Maritim Timur Perkasa have sufficient clean water, and the water used meets drinking water quality standards. PT. Maritim Timur Perkasa also maintains separate channels for sanitation and production processes.

13. Laboratory

PT. Maritim Timur Perkasa has a laboratory for testing. However, it is only used to test frozen tuna loins, not frozen demersal fish.

14. Packaging

PT. Maritim Timur Perkasa uses food-grade plastic packaging for frozen fish products, ensuring they are non-toxic. The packaging consists of two layers: PE plastic that comes into direct contact with the fish and a plastic sack.

15. Transportation

The transportation used for product distribution uses container trucks and ships equipped with refrigeration.

16. Training

PT. Maritim Timur Perkasa also conducts a one-month training program for new employees on the application of basic principles and good and correct production practices, basic hygiene practices, and factors that cause food spoilage and quality degradation.

17. Product recall

Product recalls are still carried out by companies if there are products that can cause illness or poisoning in consumers.

18. Implementation of guidelines

In its implementation, the QC head will document every application of GMP in the frozen fish production process in the form of photos and administrative notes.

SSOP Implementation

The implementation of SSOP at PT. Maritim Timur Perkasa has met the standards in accordance with the Regulation of the Minister of Maritime Affairs and Fisheries No. 17 of 2019. The SSOP parameters implemented at PT. Maritim Timur Perkasa include:

1. Water and Ice Safety

PT Maritim Timur Perkasa uses water from the Regional Water Company (PDAM), which is safe for use. The water used at PT Maritim Timur Perkasa meets health requirements, including being colorless, odorless, and free of heavy metals. Water is used in operational activities, including making ice. Ice is also stored properly, being placed on a pan first and not on the floor. This is to prevent cross-contamination.

2. Equipment in Direct Contact with Products

The equipment used is made of rust-resistant materials, is easy to clean, and does not cause contamination. Equipment that comes into direct contact with the product is always ensured to be clean, both before and after use. Equipment used in frozen fish processing is also separated for handling raw materials and products at different stages of the process.

3. Cross-Contamination Prevention

Cross-contamination prevention measures implemented at PT. Maritim Timur Perkasa include prior entry into the production area. Employees are required to wash their hands, wear gloves, and wash their boots in a chlorine-containing footbath before entering. Employees are also required to wear work attire while in the production area, including hairnets, aprons, gloves, masks, and boots. Furthermore, employees are not permitted to wear work attire outside the production area.

4. Handwashing, Sanitation, and Toilet Facilities

Handwashing, sanitation, and toilet facilities at PT. Maritim Timur Perkasa are located separately from the production area and the raw material receiving area. The sanitation facilities serve as a place for employees to change clothes before entering the production area. Handwashing facilities include soap, a sink, and gloves. The handwashing area and toilets use running water, and are equipped with hand dryers and dry tissues.

These facilities are used to maintain employee hygiene before entering the production area. Handwashing, sanitation, and restroom facilities are cleaned daily, both before and after work activities by cleaning staff. Handwashing and sanitation facilities are located separately from the production area but remain easily accessible to employees. Restrooms are located away from the production area to prevent cross-contamination, as restrooms are a source of bacteria.

5. Protection from Contaminants

Chemicals at PT. Maritim Timur Perkasa are used according to the instructions set out in the company's SOPs, for example, using chlorine at a predetermined concentration to be mixed with the washing water. Chemicals are also stored in a separate room from the processed product storage area. All chemical use is supervised by the head of QC and the head of production.

6. Labeling, Storage, and Use of Hazardous Chemicals

Every container of hazardous chemicals at PT. Maritim Timur Perkasa is clearly labeled, and its use is carried out in accordance with standard operating procedures (SOPs). Chemicals are also stored in a separate area from equipment used to process frozen fish.

7. Supervision of Employee Hygiene and Health Conditions

Employee hygiene and health monitoring is carried out through preventative measures, including enforcing a rule that any employee who is sick is not permitted to work in the production area or have direct contact with products or production equipment. Employees are not permitted to eat or drink in the production area while working.
Employees are also prohibited from having long or dirty nails, and they will be checked weekly, namely before entering the production area on Mondays.
8. Pest Control

Pest control aims to prevent pests from entering production areas. Pest control at PT. Maritim Timur Perkasa involves installing PVC curtains at each door and using pest prep devices placed on the sides of the ceiling.

DISCUSSION

Frozen Fish Processing Process for Quality Management and Food Safety

Manajemen Quality and food safety management in frozen demersal fish processing at PT. Maritim Timur Perkasa demonstrates a relatively good commitment as a new company operating in the strategic region of East Nusa Tenggara. Based on observations, the frozen fish production process at PT. Maritim Timur Perkasa follows the basic flow of SNI 4110:2020, but does not utilize the weeding stage or the whole-round method. This can pose a risk of increasing the microbiological contamination load if the fish is not frozen immediately and handled properly (Viji *et al*., 2015). Therefore, strict cold chain implementation is crucial. Research also shows that the types of demersal fish raw materials at PT. Maritim Timur Perkasa are quite diverse, requiring specific handling at each production stage to prevent cross-contamination between species (Duarte *et al*., 2020). In this regard, initial quality monitoring through organoleptic examination is a crucial step in determining the suitability of raw materials before entering the production line. In addition, emphasis on loading and unloading speed and temperature measurement during the receiving stage needs to be carried out (Fadly *et al*., 2024), even though the source of raw materials comes from local fishermen who have a relatively short distribution duration.

Manejemen Quality management and food safety in the frozen fish processing process at PT. Maritim Timur Perkasa is also carried out by washing with cold water with a chlorine concentration of 50 ppm. This aims to prevent contamination of the fish surface from harmful microorganisms while maintaining the fish's temperature to maintain freshness before freezing (Sirait *et al*., 2022). Then, the fish are arranged on a long pan with the provision of not exceeding the height of the long pan, which aims to support the physical protection of the product and reduce the risk of physical damage to the fish (Setyaningrum, 2015). Control of critical process stages, especially freezing and glazing, also plays a crucial role in the quality and safety management of processed frozen fish products. Freezing at PT. Maritim Timur Perkasa is carried out quickly and in a controlled manner. This aims to maintain nutritional value, as well as physical characteristics such as taste, texture, flavor, and color of the fish (Yanuari *et al*., 2024). Next, the glazing stage uses cold water and ice to protect the fish surfaces from sticking together and to maintain moisture, flavor, texture, and color (Masyitho *et al*., 2023). Food quality and safety are further protected through the application of double packaging, which provides additional protection and maintains product hygiene during distribution. The packaged product is then placed in a frozen storage facility at -20°C. This ensures the final frozen fish product remains cold, thus maintaining its quality and freshness (Fauziah *et al*., 2023).

Implementation of GMP and SSOP for Quality Management and Food Safety

The implementation of GMP at PT. Maritim Timur Perkasa also needs to be monitored to maximize the quality management and food safety of its products. Based on observations, the implementation of GMP at PT. Maritim Timur Perkasa generally refers to the provisions of Ministerial Regulation of Maritime Affairs and Fisheries No. 17 of 2019 with a high level of compliance, namely the fulfillment of 17 of the 18 required aspects. Nevertheless, continuous monitoring is still needed to optimize quality management and food safety. The company's strategic location close to the fish loading and unloading location at the Tenau PPP contributes to reducing raw material transportation time and the potential for quality degradation. In terms of buildings, PT. Maritim Timur Perkasa is supported by a good drainage system, as well as the use of epoxy-coated floors and PVC curtains that effectively prevent contamination. In addition, the separation between rooms also supports a hygienic process flow (Melista *et al*., 2024). Other GMP implementations are reflected in employee hygiene aspects, as well as the presence, implementation mechanisms of supervision, and strict SOP sanctions. The implementation of a routine sanitation program accompanied by orderly documentation also supports product traceability and quality consistency. The implementation of GMP in maintaining food quality and safety at PT. Maritim also includes control at the final product stage by checking for physical damage and product temperature. However, the limited specific laboratory testing for demersal fish can be a gap in the lack of quality management and food safety at PT. Maritim Timur Perkasa, although it is offset by the use of equipment that meets food-grade standards and raw materials that have been selected organoleptically to support product safety in the initial stages of processing. Furthermore, incomplete product labeling has the potential to affect consumer confidence and market access (Afni *et al*., 2025).

Quality management and food safety also address the implementation of SSOPs. Based on research results, the implementation of SSOPs at PT. Maritim Timur Perkasa has met eight parameters in accordance with Ministerial Regulation No. 17 of 2019. This is implemented by fulfilling the safety aspects of sterilized water and ice sourced from the Regional Water Company (PDAM), and supported by an adequate ice storage system. The use of stainless steel equipment and the separation of equipment functions at each process stage contribute to minimizing the risk of microbiological contamination. Cross-contamination prevention is also implemented through mandatory handwashing and footwear washing using chlorine solution, the use of complete personal protective equipment, and a prohibition on wearing clothing from outside the production area. The availability of separate handwashing and toilet facilities, equipped with running water and daily cleaning, also helps reduce the potential for the spread of biological contamination. In addition, protection of materials and products from contaminant sources is carried out through a separate storage system and supervision by Quality Control officers. Meanwhile, chemical management, including labeling and use, has been adjusted to applicable standard operating procedures. Employee health aspects are also considered through a policy of prohibiting sick employees from working and regular personal hygiene checks. All these efforts are complemented by pest control through the use of PVC curtains and pest repellers, so that the overall implementation of SSOP is in line with the principle of prevention in quality management and food safety.

CONCLUSION

PT. Maritim Timur Perkasa applies quality management and food safety in the processing of frozen demersal fish with a framework that refers to SNI 4110:2020 for the processing aspect of frozen fish products, as well as Minister of Maritime Affairs and Fisheries Regulation No. 17 of 2019 for GMP and SSOP provisions. In the implementation of quality management and food safety, there are several obstacles related to quality aspects that still need to be

strengthened, including: No weeding stage is carried out, several organoleptic parameters of raw materials are in the moderate range, product labeling is still incomplete, and limited specific laboratory testing on demersal fish.

ACKNOWLEDGMENTS

The author realizes that the preparation of this work involved various processes and obstacles, particularly in obtaining and processing data. However, the author would like to take this opportunity to express his gratitude and appreciation to all staff at PT. Maritim Timur Pekasa Kupang, his parents, lecturers, friends, and the journal publisher, for their guidance and support, both directly and indirectly, so that all these obstacles could be overcome successfully.

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