



Review of Fish Quality Control Systems and Food Safety Standards in Somalia

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Article Info

P-ISSN: 3051-3464

E-ISSN: 3051-3472

Volume: 02

Issue: 01

Received: 10-12-2025

Accepted: 12-01-2026

Published: 14-02-2026

Page No: 14-20

Abstract

This review examines the status of fish quality control systems and food safety standards in Somalia between 2015 and 2024, with emphasis on post-harvest handling, cold-chain infrastructure, institutional governance, and compliance with international standards such as HACCP, ISO 22000, and the Codex Alimentarius. The study adopts a descriptive, cross-sectional review approach using secondary data, policy frameworks, institutional reports, and development partner documentation. Findings indicate that, despite Somalia's strategic geographic position and vast Exclusive Economic Zone, the fisheries sector remains dominated by artisanal production systems with inadequate preservation technologies, weak cold-chain coverage, and post-harvest losses estimated at 20–40%. Most landing sites lack basic sanitary facilities, clean water, and ice supply, increasing risks of microbial contamination and reducing product shelf life. Institutional fragmentation between federal and state authorities, limited inspection capacity, insufficient accredited laboratories, and low levels of HACCP/ISO certification further constrain export competitiveness, particularly in accessing EU and Gulf markets. While ongoing initiatives by FAO, the World Bank, and other partners have introduced infrastructure upgrades and training programs, sustainable sectoral transformation requires long-term investment, coordinated governance, digital traceability systems, and a centralised national food safety authority. Strengthening quality assurance and cold-chain systems is therefore essential not only for public health, but also for trade competitiveness and realization of Somalia's Blue Economy potential.

DOI: <https://doi.org/10.54660/IJFAI.2026.2.1.14-20>

Keywords: Fisheries, Somalia, Food Safety, HACCP, ISO 22000, Quality Control, Cold Chain, and Traceability

1. Introduction

Somalia boasts one of the longest coastlines in Africa, stretching around the Indian Ocean, equating to 3,300 km, which gives it access to abundant marine resources under its Exclusive Economic Zone, which are tuna, sardines, mackerel, lobster, and shrimp (FAO, 2021; FAO, 2022; World Bank, 2023) ^[9, 10, 37]. They can play a key role in supporting the economic growth of the country, creating jobs, and enhancing food security, provided that they are managed and included in the National Development Plan and the Blue Economy Strategy (Federal Government of Somalia, 2024; AU-IBAR, 2023) ^[5, 1]. This prospect notwithstanding, the fisheries sector is underdeveloped and commonly referred to as a sleeping giant of the blue economy in Somalia (World Bank, 2024; FAO, 2023) ^[38, 11].

International bottlenecks still restrict the performance of the sector, such as insufficient infrastructure, ineffective governance frameworks, and limited technical capability to provide food quality assurances (FAO and WHO, 2021; Hussein *et al*, 2021) ^[8, 16]. In most cases, fishing is small-scale and uses simple equipment and inefficient preservation techniques, which results in a post-harvest loss of 2030 percent of food associated with spoilage, contamination, and mishandling (FAO, 2023; Mohamed and Hassan, 2020) ^[11, 19]. However, fisheries contribute to about 70,000100,000 lives within the coastal communities and are a valuable source of affordable protein in the large urban centres like Mogadishu, Berbera, and Kismayo (World Bank, 2023;

FAO, 2022) [37, 10]. The export of fish in Somalia is still not developed, and most of the products are sold to the local market, such as Yemen, the United Arab Emirates, and Kenya, and are mainly in the form of frozen and dried fish, lobster, and shark fins (World Bank, 2024) [38]. The lack of adherence to global food safety and quality management standards, especially the HACCP and ISO 22000 limit access to increased value European and Asian markets (FAO and WHO, 2021; FAO, 2021) [8, 9]. The main obstacles are poor cold-chain infrastructure, poor access to clean water and ice, unhygienic landing sites, and the absence of laboratory testing facilities, which expose products to the risk of microbial contamination and shorten their shelf life (FAO, 2023; WHO, 2022; EU-SFSDP, 2024) [11, 40, 4].

Fisheries and food safety control are fragmented institutionally. The federal-level policy formulation is undertaken by the Ministry of Fisheries and Blue Economy, whereas implementation and enforcement are different among Federal Member States (Federal Government of Somalia, 2024) [5]. Though the National Food Safety Policy also insists on harmonised inspection systems based on the standards of Codex Alimentarius, a lack of funding and institutional capacity remains a challenge towards effective implementation (FAO, 2023; Hussein *et al*, 2021) [11, 16]. Reforms have been facilitated by development partners,

including FAO, the World Bank, and the European Union, through infrastructure regeneration, HACCP training, inspection procedures, and cold-chain development programs (FAO, 2023; EU-SFSDP, 2024; World Bank, 2024) [11, 4, 38]. Poor fish handling is an increasing health issue in society. Cases of bacterial contamination of fish markets have been reported because of insufficiencies in refrigeration facilities and high ambient temperatures (WHO, 2022; Mohamed and Hassan, 2020) [40, 19]. In food safety, consumer awareness is still low, where the price factor is often considered higher than the hygiene factor, unlike in neighbouring countries, like Kenya and Tanzania, which have established stronger consumer protection and inspection systems (FAO and WHO, 2021) [8].

The international food safety standards are not only critical to the protection of the health of the people, but also in the development of competitiveness in trade. Enhancing the inspection, testing, documentation, and traceability systems is essential to increase the number of exports and join frameworks like the African Continental Free Trade Area (AU-IBAR, 2023; Federal Government of Somalia, 2024) [1, 5]. Better food safety regulation would help in creating more robust food systems, higher investor trust, and sustainable economic and nutritional performance (WHO, 2022; World Bank, 2024) [40, 38].

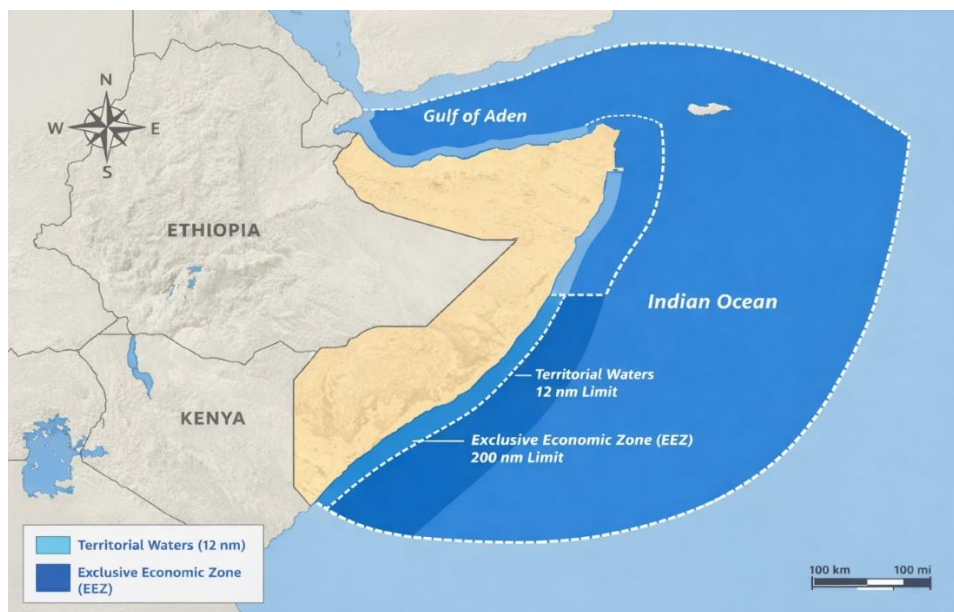


Fig 1: map of the Somali's fisheries zone

1.1. Objective

The primary objective of this review paper is to critically review the current state of fish quality control systems and food safety standards in Somalia's fisheries sector.

1.2. Novel Scientific Contributions

This review offers three key scientific contributions: (i) an integrated value-chain analysis linking post-harvest losses with governance and food safety systems; (ii) a structured assessment of Somalia's alignment with international food safety standards within a post-conflict federal governance context; and (iii) a synthesis of recent reform initiatives and projected impacts, providing evidence-based priorities for future policy and investment.

2. Method and Scope

The research is based on the PRISMA principles of systematic reviews.

2.1. Research Question

What is the status of fish quality control systems and food safety standards in Somalia, and what institutional, infrastructural, and regulatory gaps have been reported between 2015 and 2024?

2.2. Search Strategy

The literature search was conducted in November 2025 using Google Scholar, Scopus, Web of Science, the FAO-SWALIM Open Repository, and the UNEP and UN-Habitat

environmental portals. Keywords related to fisheries, food safety, post-harvest handling, and quality control in Somalia were applied.

2.3. Inclusion Criteria

Studies or reports on Somalia's fisheries or food safety
 Published 2015–2024
 Peer-reviewed papers, policy reports, and FAO/World Bank studies

2.4. Exclusion Criteria

Studies outside Somalia
 Aquaculture not linked to food safety
 Media articles or opinion essays

2.5. Screening and Selection

Titles, abstracts, and reference lists were screened. Relevant full texts were reviewed and synthesised thematically across governance, infrastructure, standards compliance, and value-chain quality systems.

3. Result

3.1. Institutional and Legal Framework

The management of fish in Somalia is determined by a complicated federal system. At the federal level, the Ministry of Fisheries and Blue Economy (MoFBE) sets the policies, issues licenses, regulates the industry, and plans national marine strategies (Federal Government of Somalia, 2024) [5]. Federal Member State (FMS) fisheries ministries control artisanal licenses, coastal zones, and local regulations on the local level (Oirere, 2025) [21]. Although the dual system is expected to decentralise management, the system typically ends up with overlapping mandates, unequal enforcement,

and low integration (Glaser *et al.*, 2019) [15]. The National Food Safety Policy (NFSP 2024) regulates the quality and safety of food, and its development was done in conjunction with MoFBE and the Ministry of Livestock, Forestry, and Range. NFSP presents combined inspection and certification, and traceability in accordance with the Codex Alimentarius and WTO SPS requirements. Interventions are planned, but they cannot be carried out due to insufficient funding, poor implementation, and a lack of laboratory facilities (Federal Republic of Somalia, 2024) [6]. The Somali Bureau of Standards (SBS 2020) deals with the national standardisation, certification, and accreditation. It also works together with MoFBE regarding fisheries-specific quality assurance, sanitary certification, vessel registration, and inspections (Abdirahman *et al.* 2023). In the meantime, foodborne diseases are monitored by the Ministry of Health and Human Services (Hassan 2024). Even with these structures, there is still a problem of coordinating, and this brings about duplication of inspections, low accountability and confusion in the regulations. NFSP suggests the formation of a National Food Safety Authority (NFSA) that will centralise control. International standards, including HACCP, ISO 22000 and Codex Alimentarius, are being introduced gradually, with pilot programs to be introduced to seafood inspectors in 2024 (Oirere, 2025) [21]. Somalia is also a member of the IGAD Blue Economy Strategy (20232033) and AfCFTA, which also presents a chance to balance the SPS standards at the regional level (Abdirahman *et al.* 2023). Nevertheless, the capacity is less than 20%: less than 1/5 of fish-handling plants meet Codex hygiene standards, and the majority of laboratories are located in Mogadishu and Berbera (SBS, 2024; Ali and Mohamed, 2024).

Table 1: Key governance gaps and reform priorities

Challenge	Proposed Reform
Institutional overlap (MoFBE & FMS)	Establish NFSA
Weak inspection/lab capacity	Invest in labs, training, and digital traceability.
IUU fishing & uncoordinated licensing	Clarify jurisdiction, improve vessel monitoring.
Limited HACCP compliance	Expand training & certification
Fragmented data	Develop an integrated fisheries information system

Institutional fragmentation in Somalia’s fisheries sector creates regulatory overlaps between federal and state authorities, increasing the risk of illegal fishing, while limited financial and technological capacity, including insufficient inspectors and laboratories, hinders enforcement.

Strengthening coordination through the National Food Safety Policy, establishing a central food safety agency, investing in laboratories, and adhering to international standards are essential for sustainable fisheries management and consumer protection (Hassan 2024; Oirere 2025) [21].



Fig 2: Legal and Standards Framework Alignment

3.2. Fish Quality Control Systems Long the Value Chain

Somalia’s fisheries are mostly artisanal, and vessels lack proper preservation systems. Consequently, post-harvest losses can reach 40%, especially in tropical conditions (SDRB, 2025; One Earth Future, 2024) ^[29, 23]. Small-scale interventions, such as solar-powered ice rooms and cold storage, exist, but coverage is limited (EEAS, 2024) ^[3]. Landing sites often lack clean water, hygienic handling surfaces, and waste management, further increasing spoilage and transportation costs by 15–30%. Processing facilities are

minimal, with less than 10% of catches formally processed (U.S. Trade and Investment Guide, 2024). HACCP and ISO 22000 adoption is still in the early stages, supported by donor programs.

At retail, fish is commonly displayed without refrigeration, exposing products to ambient temperatures above 30°C and increasing microbial risks (UBBO and Company, 2025; Mohamed and Hassan, 2020) ^[33, 19]. Limited traceability and certification hinder export potential, especially to high-value markets such as the EU and Gulf States.

Table 2: Estimated post-harvest losses by stage

Stage	Loss (%)
Harvesting/At-sea	15–20
Landing & Handling	10–15
Transport	5–10
Processing	5
Retail	5

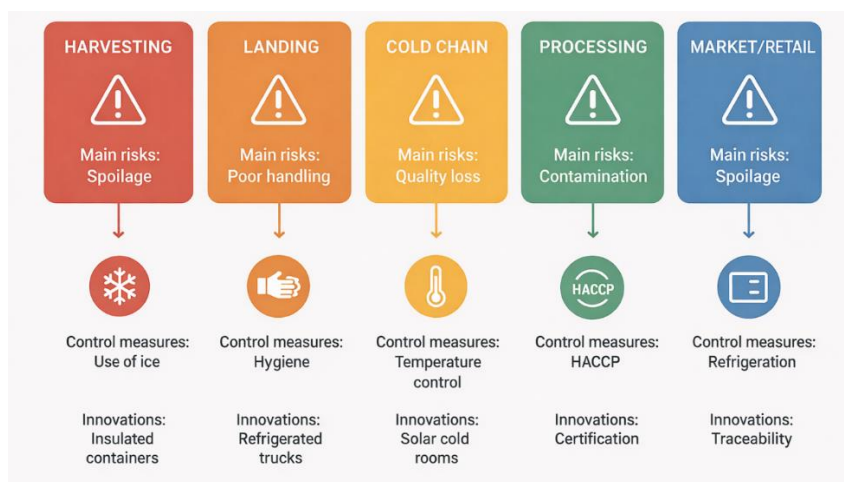


Fig 3: Fish Quality Control Across the Value Chain

3.3. Food Safety Standards and Global Congruence.

Somalia is aligning its fisheries safety system with Codex Alimentarius, HACCP, and ISO 22000. The Somali National Codex Committee approved over 80 standards for fish in 2023 (FAO, 2023) ^[12]. HACCP adoption remains limited to pilot projects and export-oriented processors, while ISO 22000 certification is rare but growing (Shem, 2025) ^[27].

Regional cooperation through IGAD and AU-IBAR strengthens SPS compliance, traceability, and lab networks, enabling harmonisation of standards and market access. Nevertheless, challenges include limited inspections, inadequate labs, low awareness among artisanal fishers, and weak federal-state coordination, all restricting compliance and export readiness (Seafood Source, 2025).

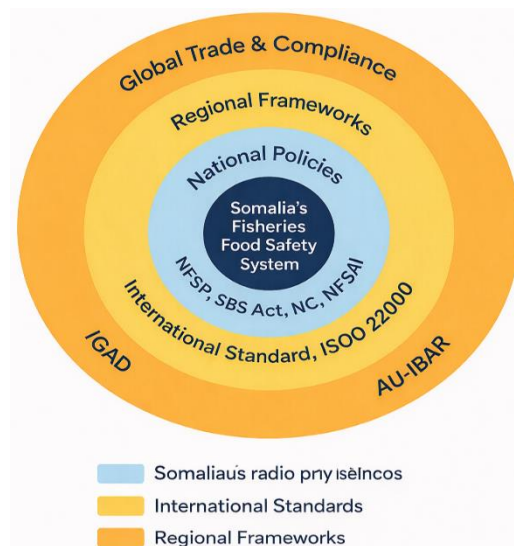


Fig 4: Somalia’s Food Safety Alignment Framework

3.4. Present Projects and New Reforms.

Key initiatives since 2021 aim to modernise Somalia's fisheries sector:

Somalia Blue Economy Development Project (World Bank 2024): Governance, infrastructure, SMEs, HACCP-based traceability.

FAO Fisheries Infrastructure & Food Safety Support Program (2023–2025): Solar-powered cold storage, mobile

labs, cooperative training.

RAAISE Project (EU & IFAD): Value addition, cold-chain management, cooperative governance.

UNDP Blue Economy Portfolio (2024–2027): Digital catch documentation, IUU monitoring.

Bilateral programs (JICA, AICS): Capacity building, market rehabilitation, hygiene training.

Table 3: Projected Impact of Fisheries Reforms (2023–2027)

Indicator	Baseline (2023)	2025 (Mid-term)	2027 (Projected)	Change (%)
Post-harvest losses (%)	35	25	20	↓ 43%
Certified processors (number)	5	18	35	↑ 600%
Landing sites with cold storage	3	9	15	↑ 400%
Women employed in fisheries (%)	12	18	25	↑ 108%
Traceability-compliant exports (tons)	200	600	1,000	↑ 400%

3.5. Gaps, Challenges, and Barriers.

Key constraints in Somalia's fisheries sector include:

Few accredited labs, limited equipment, and a lack of trained staff hinder testing, certification, and export compliance (One Earth Future Foundation 2024; Shem, 2025) ^[27]. Cold Weak refrigeration, poor transport, and unreliable power result in 30–40% post-harvest losses (One Earth Future Foundation, 2024; UBBO & Company, 2025) ^[23, 33].

Overlapping mandates and weak inspections lead to unsafe products and reduced export credibility (Abdirahman *et al.*, 2023; Ali & Mohamed, 2024).

Low public and private funding limits infrastructure development and ME growth (SATG, 2023) ^[25].

Manual documentation and a lack of digital integration reduce certification opportunities and increase IUU fishing risks (Seafood Source, 2025; UNDP Somalia, 2024) ^[21, 34].

Table 4: Relative Severity and Impact of Major Barriers (Expert Assessment, 2025)

System Element	Main Gap	Implications
Inspection & Laboratories	Few accredited labs, limited testing equipment, and trained personnel	Inability to verify export compliance or detect contamination
Cold Chain & Logistics	Weak refrigeration, poor transport, and unreliable power reliability	30–40% post-harvest loss, reduced market value
Enforcement & Standards	Overlapping mandates, weak inspection	Unsafe products, Loss of export credibility
Investment & Finance	Low public/private investment	Infrastructure stagnation, SME barriers
Traceability & Data Systems	Manual documentation, no digital integration	Limited certification, higher IUU risk

4. Discussion

The Somali fisheries sector holds substantial potential for economic growth, employment generation, and food security. However, the findings indicate that this potential remains largely untapped due to systemic challenges spanning governance, infrastructure, regulatory compliance, and stakeholder awareness. These limitations not only constrain the domestic value of fisheries but also restrict Somalia's participation in high-value global markets.

Institutional fragmentation is a key obstacle. The dual governance model—where the Ministry of Fisheries and Blue Economy (MoFBE) operates at the federal level, and Federal Member State (FMS) ministries manage local fisheries—has created overlapping mandates, duplication of inspections, and inconsistent enforcement. This fragmentation reduces regulatory efficiency and hinders the adoption of international food safety standards such as HACCP, ISO 22000, and Codex Alimentarius.

Strengthening governance requires establishing a centralised National Food Safety Authority (NFSA) to unify oversight, standardise inspection protocols, and coordinate enforcement across regions. Such centralisation could also enhance compliance monitoring, reduce illegal, unreported, and unregulated (IUU) fishing, and ensure that food safety standards are applied consistently. Moreover, better inter-agency coordination between MoFBE, the Somali Bureau of Standards (SBS), and the Ministry of Health could improve

the monitoring of microbial contamination and foodborne illness surveillance, which are critical for public health and trade credibility.

Post-harvest losses remain a critical constraint, largely due to insufficient cold-chain infrastructure and limited processing facilities. The absence of ice, refrigeration, clean water, and waste management systems at landing sites and retail outlets accelerates spoilage, increases microbial contamination, and reduces shelf life.

Investments in solar-powered cold storage, refrigerated transport, and decentralised processing facilities can mitigate these losses. These interventions are particularly important for small-scale artisanal fishers, who dominate the sector and are most vulnerable to post-harvest inefficiencies. Furthermore, integrating public-private partnerships (PPPs) could mobilise investment, share operational risks, and ensure the sustainability of cold-chain and value-added processing infrastructure. Enhanced storage and processing capacity would not only improve domestic supply and food safety but also strengthen export readiness for high-value international markets.

Compliance with international food safety standards is essential for accessing lucrative markets. Currently, limited adoption of HACCP and ISO 22000 standards restricts Somalia's export potential, confining trade largely to neighbouring regional markets such as Yemen, the UAE, and Kenya. Expansion into European and Asian markets requires

enhanced traceability, certification, and quality assurance systems.

Digital traceability systems, as piloted by UNDP, can significantly improve transparency along the value chain, reducing opportunities for fraud and IUU fishing while providing documented compliance for international buyers. Aligning national standards with regional frameworks such as IGAD and AfCFTA can further facilitate market access, harmonise regulations, and strengthen regional cooperation in fisheries management.

Comparative analysis with neighbouring East African countries shows that investments in cold-chain infrastructure, regulatory oversight, and consumer education directly correlate with reduced post-harvest losses and increased export revenues. Kenya and Tanzania, for example, have successfully integrated solar-powered cold storage, HACCP certification, and market inspections, resulting in improved product quality and higher export volumes. Somalia can adopt similar approaches while tailoring strategies to its unique post-conflict governance context, fragile infrastructure, and artisanal-dominated fisheries system.

Low awareness of food safety practices among fishers, traders, and consumers compounds the challenges. In many markets, price considerations overshadow hygiene concerns, leading to unsafe handling and increased microbial risks. Lessons from Kenya and Tanzania demonstrate that consumer education campaigns, combined with regular market inspections, improve compliance and build consumer confidence.

Capacity building is also essential for inspectors, laboratory personnel, and value-chain actors. Training in HACCP, ISO 22000, and traceability protocols will improve compliance, reduce post-harvest losses, and increase the number of certified processors. Moreover, fostering cooperative associations among fishers can encourage knowledge sharing, collective investment in cold-chain infrastructure, and adherence to quality standards.

5. Conclusion

Somalia's fisheries sector holds significant potential for economic growth, employment generation, and food security; however, its development is constrained by systemic weaknesses in food safety governance and quality control. High post-harvest losses, limited cold-chain capacity, unhygienic landing facilities, and weak inspection and laboratory systems undermine product safety and market value. Fragmented institutional mandates and low compliance with HACCP, ISO 22000, and Codex standards restrict access to high-value export markets and erode consumer confidence.

Although national initiatives such as the National Food Safety Policy and the Somali Bureau of Standards provide a strategic policy foundation, implementation remains limited due to resource, capacity, and coordination gaps. Achieving a competitive and resilient fisheries sector requires strengthened governance alignment, expanded laboratory and inspection capability, digitalised traceability systems, and investment in cold-chain infrastructure across the value chain. Advancing these reforms will enhance public health protection, improve export readiness, and enable Somalia to leverage its Blue Economy opportunities more sustainably.

Ethical Statement

This research did not have human subjects or animals. All the data were received via secondary sources, official reports that were performed in compliance with ethical research standards.

Author Contribution

Conceptualisation: Sakariye Ahmed Hashi Methodology: Mohamed Sharif Hussein Writing- Original Draft Preparation Sakariye Ahmed Hashi Writing and Editing: Mohamed Sharif Hussein The author has read and approved the final version of the manuscript.

Funding

No targeted grant was provided by any government, commercial, or non-government funding body to fund this research.

Conflict of Interest

This study did not have any outside funding. Competing interests that may affect the research work are nonexistent.

7. Recommendations

Somalia should strengthen cold-chain infrastructure, expand HACCP and ISO 22000 certification, and improve laboratory, inspection, and traceability systems to reduce post-harvest losses and enhance food safety and export readiness. A centralised National Food Safety Authority, stronger PPP investment, capacity-building for value-chain actors, and regional cooperation are essential to improve regulatory coordination, product quality, and market access.

Acknowledgment

Sincere appreciation is extended to all individuals and institutions whose support, guidance, and contributions made this review possible.

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How to Cite This Article

Hashi SA, Muse BJ. Review of fish quality control systems and food safety standards in Somalia. *Int J Fish Aquat Increment Innov*. 2026;2(1):14-20. doi:10.54660/IJFAII.2026.2.1.14-20.

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