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A Food Chain Approach to the Export of Aquaculture Products

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As global food trade grows, importing countries are striving to ensure the safety of imported food, and exporting governments and companies need to efficiently meet the standards of various countries and companies. Particularly, exports to EU countries require official control of food safety and quality throughout the entire food chain, and exporting countries need to comply with the requirements of not only companies but also of competent authority.

Focusing on a food chain approach to the export of aquaculture products, we examine the challenges in the food chain of cultivated yellowtail in Japan. Moreover, we overview how Thailand, a leading exporter in Southeast Asia, established an export system.

1. Thailand's export-oriented food chain

Thailand, one of the leading exporters of agricultural and marine products worldwide, has been rapidly developing its export system since the 1990s. Figure 1 shows the certification and documentation required for the export of farmed shrimp. Thailand has established

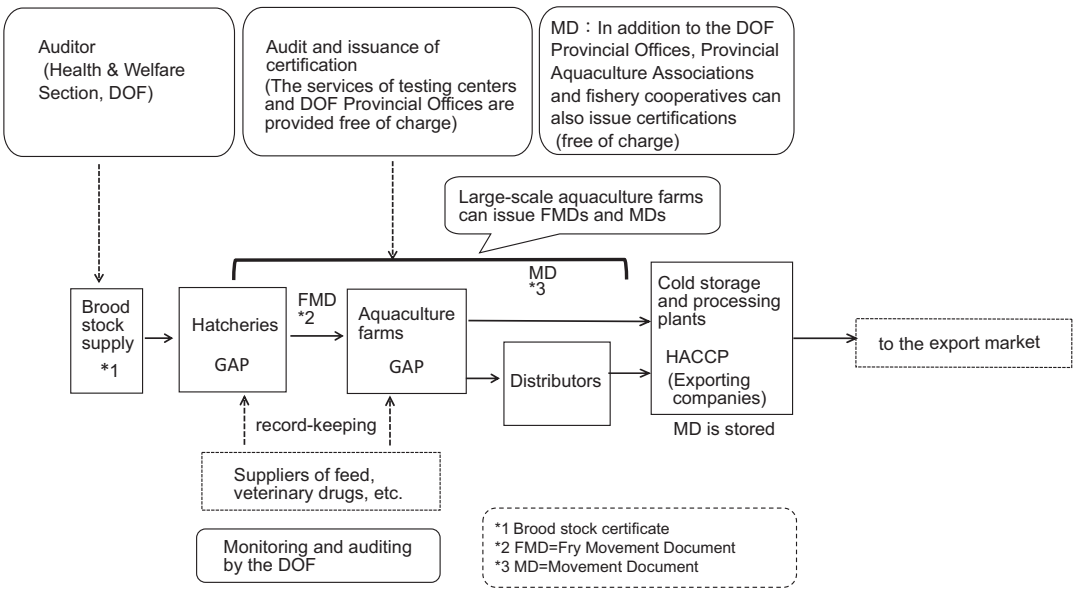

Figure 1. Application for certification and documentation required for the export of farmed shrimp in Thailand

Materials: Yamao, Amano (2018) p. 93, from Figure 2

a system conforming to EU standards that require management of the entire food chain. Starting from the stage registering the shrimp brood stock ("brood stock") bred for the production of juvenile shrimp, the entire system is managed by the Department of Fisheries (DOF) of the Thai government. For export, complying with Good Aquaculture Practices (GAP) is mandatory for hatcheries and aquaculture farms, and complying with Hazard Analysis Critical Control Points (HACCP) is mandatory for cold storage and processing plants. Thailand's public GAP have been widely adopted by aquaculture farms. Moreover, some large-scale aquaculture farms have additionally obtained BAP (Best Aquaculture Practices) and ASC (Aquaculture Stewardship Council) certifications, depending on the export destination. In addition to Thailand's official HACCP, the cold storage and processing plants became compliant with EU-HACCP, USA-HACCP, ISO 22000, FSSC 22000, and so on.

In Thailand, traceability has been established from the supply of brood stock to the cold storage and processing plants, based on the production process control at each stage of the food chain. At the hatcheries, only brood stock with certification issued by the DOF can be used to produce juvenile shrimp. Aquaculture farms must obtain a Fry Movement Document (FMD) issued at DOF Provincial Fisheries offices (DOF-PFO) and qualified big hatcheries for fry rearing. For cold storage and processing plants, farmed shrimp must

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be supplied with an FMD and Movement Document (MD) issued by the DOF-PFO. The FMD and MD can be traced back to the brood stock to obtain information on the production process, including the producer at each stage of production, the cage where the fish were raised, the feed and drugs used, and the health status of the farmed shrimp.

2. Public GAP that support the food chain

A unique feature of Thailand's food chain of aquatic products intended for export is that the DOF is the competent authority responsible for food safety as the contact point for the governmental sanitation departments of the destination countries and is also the scheme owner of the public GAP. Moreover, the GAP for hatcheries and aquaculture farms have been disseminated in accordance with the laws. Thailand's public GAP are government-established standards for ensuring the safety and quality of aquatic products that cover the standards of export destinations such as Europe, Japan, and the United States, but compliance is voluntary, and certification is not mandatory. However, for export, the government provides extensive support instead of making it compulsory to obtain certification. The reason the Thai government has been making such efforts to promote the public GAP is to support small-scale producers, many of whom are unable to meet global standards, and to strengthen the industry. The safety standards required by destination countries are met efficiently and effectively by the public GAP of Thailand. Such an export-oriented approach also improves the safety of aquaculture products for domestic markets.

The following is an explanation of the dissemination and management system of the public GAP, based on a survey conducted in Chumporn, a southern province of Thailand. Producers who wish to obtain the public GAP certification first participate in training sessions organized by the DOF Provincial/District Offices. Here, producers' comprehension and practicality are checked based on the explanation of the control points and requirements in the GAP statement and a checklist. They receive advice from extension officers on how to implement appropriate aquaculture norms. Subsequently, producers prepare for the application at their own farms while consulting with the extension officers of the DOF Provincial/District Offices and with local producers who have obtained GAP certification. Once the extension officers deem that a farm has reached the point of compliance with the GAP, an audit team is dispatched to the farm by the Chumporn Fisheries Research and Development Center. The auditors follow a manual to check the control points and requirements specified in the public GAP statement (110 items with 10 control points at the highest level of difficulty and 60 items with 7 control points at the basic level). Meanwhile, procurement of eggs and fry is checked based on the FMD, and the shipment status is checked based on the MD. In addition, dated records, documents related to feed and drugs, water quality analysis, residue tests, and animal health tests are carefully reviewed. Moreover, farms are visited for inspection and sampling is carried out for animal health tests and water quality analysis. The audit takes approximately three hours (by plural auditors). To obtain public GAP certification, the control points and requirements must be met, and the results of the sample analysis must be within a normal range. Furthermore, auditors are required to possess expertise in aquaculture and participate in regular training courses.

The results of the inspections and audits are reported to the Fisheries Commodity Standard System and Traceability Division (FCSTD) of the DOF. After deliberation, the FCSTD issues GAP certifications to eligible aquaculture farms. The period of validity of the certification is three years. Follow-up audits are conducted every year. The Chumporn Fisheries Research and Development Center is in charge of the initial, follow-up, and recertification audits. Moreover, the center also conducts monitoring inspections in compliance with the standards of export destinations, whenever necessary. Thus, the DOF is in charge of the dissemination and management of the public GAP. The DOF also strives to ensure its objectivity and transparency as a certification system. The division in charge of auditing and certification and the division in charge of dissemination and education are not mutually involved. Furthermore, to have the public GAP recognized as a certification system, FCSTD, the certification body, has to get ISO/IEC17065 certification, and the Chumporn Fisheries Research and Development Center, the inspection body, has to receive ISO/IEC17020 certification.

Since the acquisition of the public GAP certification is free of charge, the number of certifications acquired has increased in recent years. Keeping up with the increased number of applicants for certification has become a critical issue. Previously, there were certification and inspection bodies, but they were not widely used due to the audit cost. In Chumporn Province, for example, the percentage of public GAP certification among export- and domestic-market-oriented aquaculture farms has reached 70–80%. The outsourcing of certification and inspection bodies to the private sector is under consideration.

3. Challenges in the food chain of cultivated yellowtail in Japan

In the food chain of cultivated yellowtail in Japan, HACCP has been introduced mainly in fish processing plants exporting to the EU and the United States, but GAP have rarely been adopted. In the export-oriented food chain of cultivated yellowtail (Figure 2), food safety at the aquaculture production stage is generally ensured through two-party inspections with processing and distribution companies in the production area. Frying fisheries, hatcheries operations, and aquaculture farms are based on self-management. There are no unified standards. Decisions and choices pertaining to self-management and two-party inspection items, management records and procedures, and the items to be inspected are left to the discretion of individual producers, fishery cooperatives, as well as processing and trading companies in the production area. It is up to individual producers, fishery cooperatives, and the processing and distribution companies to obtain information and incorporate it into their production processes to meet the standards of export destinations. Furthermore, traceability is ensured with delivery notes as well as management records and procedures submitted upon request. Administrative monitoring and guidance regarding the supply of veterinary drugs and feed are conducted in accordance with the law. In the case of EU-registered farms, the production process at the farms is monitored annually by the Prefectural Fisheries

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Department, but the system does not resemble public GAP in Thailand.

The export of aquatic products requires food safety assurance based on a food chain approach. For domestic aquaculture products, it is necessary to connect the food chain by establishing a system that unifies standards and monitors the production process, and disseminates the GAP. Moreover, it is necessary to consider how to efficiently meet the standards of each export destination.

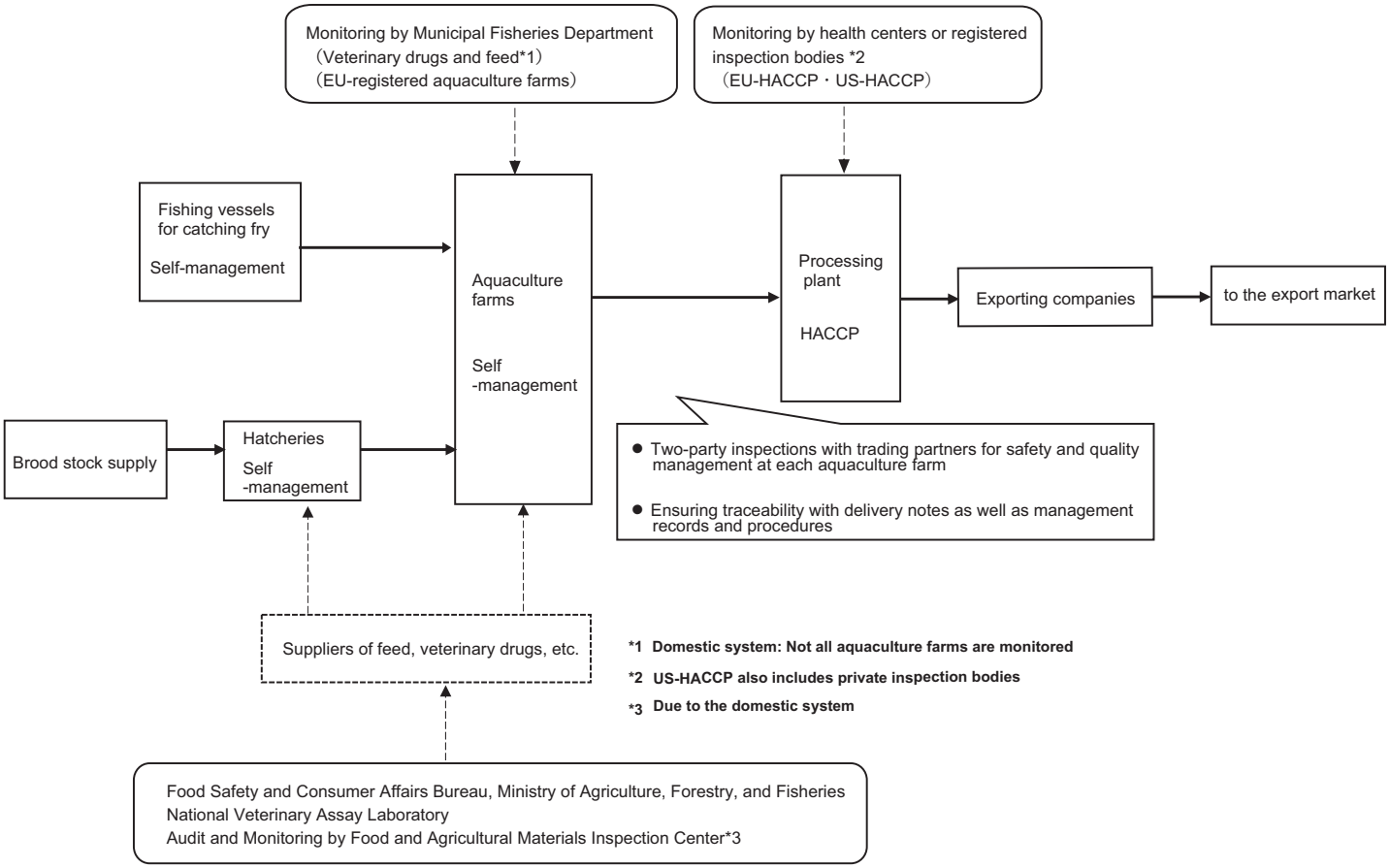

Figure 2. The food chain of cultivated yellowtail export in Japan (for export to the EU and the United States)

Materials: Prepared by the authors

【References】

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