



Seafood Quality Assurance Program for Small-Medium Enterprises in Japan

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The fishery products in Japan are classified into: surimi (fish paste) based products (Kamaboko), frozen food, and other fishery products, e.g., dried salted fish (Hirakiboshi), cured fish (Katsuobushi), etc. (Fig. 1). Japan's total production of fishery products in 2004 was 2.6 million mt. Although fishery products processors vary in size from large to small in terms of production scale, more than 99% of seafood processors in Japan are categorized as small-medium sized (under 300 employees) as shown in Table 2.

The Fishery Products Industry of Japan

In Japan, fishery products are very important because they account for 20% of the protein supply (40% of the animal protein) of its people taken from foods, and their nutritious benefits have been more recognized in recent years. The significance of fishery products in the Japanese diet is greater than those in the diets of peoples from other countries. Therefore, the safety and reliability of fishery products are of utmost importance for the wellbeing of its people and assuring them of safe fishery products that they eat.

As of 2003, reports have indicated a variety of fishery products in Japan with more than 11,000 food processors providing such products in the market (Table 1).

Table 1. Fishery products processing plants in Japan (as of 1 November of each year)

Year	Total	Canned & Bottled	Paste	Frozen Food	Salted & Dried	Feed & Fertilizer
1988	13,674	135	2,422	560	5,404	236
1993	12,575	107	2,163	527	4,866	199
1998	11,272	80	1,929	430	4,212	159
2003	11,465	84	1,929	509	3,732	129

Source: Results of Census of Fisheries from 8th to 11th, Statistics Department, Ministry of Agriculture, Forestry and Fisheries (http://www.maff.go.jp/toukei/abstract/1_9/43c.htm)

Quality Assurance Program for Seafood in Japan

Japan has adopted a Quality Assurance Program for Seafood Products, which include: (1) Policies for Application of HACCP System; (2) Certification for Export of Seafood; and (3) Improvement and Enhancement of Labeling.

Policies for Application of HACCP System

In Japan, two major policies for the application of HACCP system have been put in place. These are: (1) Approval system for comprehensive sanitary controlled manufacturing process; and (2) Temporary law on the advancement of management of production process of foods.

As a food safety control system, the hazard analysis and critical control point (HACCP) system had been introduced in Japan through the Ministry of Health, Labour and Welfare (MHLW). Using the HACCP system, MHLW aims to advance sanitary management at respective stages in the production and processing of foods. In 1995, the MHLW revised Japan's Food Sanitation Law with the establishment of the Approval System for Comprehensive Sanitary Controlled Manufacturing Process based on HACCP. The food products covered in this approval system are: milk, dairy products, meat products, foods packed in containers or packaged and pasteurized under pressure, fish paste products, non-alcoholic beverages, etc. By the end of May 2007, the MHLW approved 36 cases of fish paste products under this system (MHLW, <http://www.mhlw.go.jp/topics/bukyoku/iyaku/syoku-anzen/jigyousya/sougouisei/index.html>).

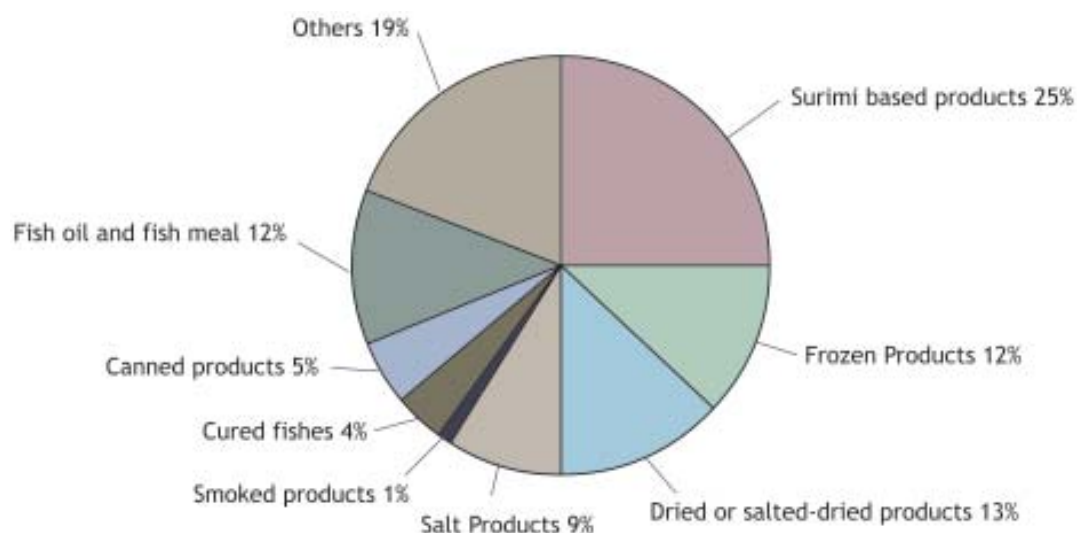


Figure. 1. Japan's production of fish-based products in 2004 (http://www.maff.go.jp/toukei/abstract/1_9/46.htm)

Table 2. Small and medium-sized processing plants (under 300 employees) and big-sized plants processing fishery products in Japan

Size (no. of employees)	Canned Seafood & Seaweeds		Seaweed products except canned		Fish paste products		Salted-dried and salted products		Frozen seafood (unprocessed and packaged)		Frozen seafood (processed and packaged)		Miscellaneous seafood products	
	no	%	no	%	no	%	no	%	no	%	no	%	no	%
4-299	132	(99.2)	901	(99.9)	1080	(99.2)	809	(100.0)	445	(100.0)	1062	(99.9)	3283	(99.8)
> 300	1	(0.8)	1	(0.1)	9	(0.8)	0	0.0	0	0.0	1	(0.1)	6	(0.2)

Source: <http://www.meti.go.jp/statistics/kougyou/2004/k3/h16-k3-data-j.xls>

As concerns have increased about the quality and safety of fishery products for food, the producers were called upon to exert efforts in hygiene management including the application of the HACCP system. However, many producers found it difficult to apply the HACCP system since it requires equipment investments and most of them are small-sized enterprises. Thus, the Temporary Law on the Advancement of Management of Production Process of Foods was enforced in July 1998 in order to support the upgrading of the facilities of food producers and processors, and encouraging them to adopt more sophisticated management schemes in the production processes based on the HACCP system.

In order to facilitate implementation of the Temporary Law, loans were provided by the Agriculture, Forestry and Fisheries Finance Corporation for the development of facilities that are required for the upgrading of control and manufacturing processes by food enterprises in order to promote the adoption of HACCP methods. Moreover, measures were undertaken by Japan for the modernization of its small-medium enterprises (SMEs) in the fishery products industry. Information related to such measures

(Box) was extracted from the White Paper on SMEs in Japan (2001-2006) of the Small and Medium Enterprises Agency (http://www.chusho.meti.go.jp/sme_english/whitepaper/whitepaper.html).



1) Surimi (fish paste) based products (Kamaboko); 2) Dried-Salted fish (Hiraki-boshi); 3) Frozen food; and 4) Cured fish (Katsuobushi)

Measures for modernization of SMEs in the fisheries industries of Japan
(extracted from White Paper on SMEs in Japan, 2001-2006; Small and Medium Enterprises Agency,
http://www.chusho.meti.go.jp/sme_english/whitepaper/whitepaper.html)

Fiscal Year	SME Policies	Budget (million ¥)
2001	Subsidies are provided for activities to upgrade quality and hygiene control through comprehensive adoption of HACCP at all stages, from production to consumption of marine food products as well as new aquaculture techniques.	134.00
2002	Subsidies are provided for activities to upgrade quality and hygiene (adoption of HACCP) of marine products.	110.00
2003	Steps should be taken to promote the introduction of HACCP procedures at marine product processing plants to provide consumers with safe and reliable marine products. Comprehensive measures should also be taken to establish concrete standards to raise hygiene control at markets in areas of production, provide support to ensure their adoption, and draw up new manuals for the production of low salt, high water content marine products.	153.00
2004	Steps should be taken to promote the introduction of HACCP procedures at marine product processing plants to provide consumers with safe and reliable marine products. Comprehensive measures should also be taken to establish concrete standards to raise hygiene control at markets in areas of production, provide support to ensure their adoption, and draw up new manuals for the production of low salt, high water content marine products. In addition, in order to develop the conditions suitable for the introduction of HACCP, "HACCP Sanitation Level Standards" will be developed to provide benchmark by which to assess the hygiene level of individual businesses, and assessments in accordance with the said standards will be promoted.	167.00
2005	Steps should be taken to promote the introduction of HACCP procedures at marine product processing plants to provide consumers with safe and reliable marine products. Comprehensive measures should also be taken to establish concrete standards to raise hygiene control at markets in areas of production, provide support to ensure their adoption, and draw up new manuals for the production of low salt, high water content marine products. In addition, in order to develop the conditions suitable for the introduction of HACCP, "HACCP Sanitation Level Standards" will be developed to provide benchmark by which to assess the hygiene level of individual businesses, and assessments in accordance with the said standards will be promoted.	150.00
2006	In order to reinforce a marine-product supply system so that it may be trusted by consumers, steps should be taken, including introduction of HACCP procedures at marine product processing plants, issuance of guidelines on implementation of hazard analysis and sanitation control for each item to support small marine processors in adopting HACCP systems, and evaluation of sanitation performance at marine product processing plants using the "HACCP Sanitation Performance Standards" and also giving advice based on such evaluations. In addition, markets with controlled sanitation performance will be popularized through issuance of guidelines on quality control according to the characteristics of each market in producing centers, and by approving and having public entities with good sanitation management announces in markets in the producing centers.	122.00

Certification for Export of Seafood

The Certification for Japan's Seafood Export to the United States was established by the MHLW and the Ministry of Agriculture, Forestry and Fisheries (MAFF). The Director of Inspection and Safety Division of the Department of Food Safety, MHLW issues the "Directive for US Export

Seafood Processors" to the local governments at the Prefecture level. The directive stipulates that when a processor wishes to obtain certification from MHLW to be able to export seafood to the United States (US), the processor must comply with the FDA Seafood HACCP

Regulation and Good Manufacturing Practice Regulation (21 CFR part 110 and 123).

The directive also requires designated food sanitation inspectors in the prefecture governments to inspect the processing facilities based on the aforementioned regulations, in addition to the usual inspection conducted in accordance with the Food Sanitation Law of Japan. The designated food sanitation inspectors are trained and are equipped with knowledge relevant to 21 CFR 110 and 123.

For seafood export to the European Union (EU), the MHLW elaborated on the rules and regulations so that each exporting processing plant is required to process the seafood under its own-control system based on HACCP and to comply with all the pertinent requirements by the EU. The list of certified seafood processors allowed to export seafood to the US and EU are announced officially on the website of MHLW and MAFF. As of the end of May 2007, about 90 processing plants were certified to export seafood to the US while 20 processing plants were certified to export seafood to the EU.

Improvement and Enhancement of Labeling

Since occurrences of fraudulent food labeling were observed in Japan since July 2000, various measures were developed and adopted to improve the labeling of the country's fishery products. Thus, it has been required that the label of each fresh fishery product must show the name and place of origin of the product under the Japan Agriculture Standards Law, and also to indicate in the label whether the product is "defrosted" or "cultured" as the case may be. Moreover, starting in April 2001, it has been required that the label of each processed food must indicate the "ingredients" and "use-by date". Since February 2002, the label of each designated processed item such as salted mackerel, etc. should show the "place of origin of its raw material". Currently, there are six (6) designated processed items that are required to show this label.

In order to make the labels easily understood, two sets of guidelines were established and adopted: (1) Guidelines for the Names of Fish and Shellfish, which were implemented since April 2003; and (2) Guidelines for Indication of Place of Origin (the Producing Water Area) of Fresh Seafood implemented since July 2003.

In September 2004, the "labeling standards for processed foods" were revised requiring to also include in the label the place of origin of main ingredients of all processed foods close to fresh foods such as dried young sardines (shirasu boshi) and lightly-roasted sliced bonito (katsuo no tataki). These two are in addition to the six processed



dried young sardine (shirasu boshi); and lightly-roasted sliced bonito (katsuo no tataki)

products (e.g., salted mackerel) to which such requirements have already been applied. The revised labeling for these groups became obligatory starting in October 2006.

In Japan, the national and prefectural governments have implemented surveillance and guideline regarding compliance of food label regulations by conducting on-site inspections and regular monitoring surveys at food stores. A nationwide telephone number has been established for food label inquiries and to collect information on food labeling from a wide range of people. In July 2005, the MAFF formulated guidelines for the labeling of place of origin of ingredients used in the food service industry.

Related Topics on Food Safety and Reliability of Seafood in Japan

Traceability of Seafood

The establishment of a traceability system of seafood is important for the safety and reliability of the seafood products. In Japan, the Japan Fisheries Association and the Fishing Boat and System Engineering Association initiated a traceability system of seafood based on the EU TraceFish system with subsidy from the MAFF. Known as the J-FISH system, this traceability system facilitates verification by consumers on such data in the labels as "place of capture of fish", "time of capture of fish", "changes in temperature during transport", etc. and in case of inquiries and complaints, to input the "traceability number" of the products in the website <http://www.j-fish.net/>.

ISO 22000

In September 2005, the International Organization for Standardization (ISO) published a new food safety

management system based on the HACCP, which is officially called ISO 22000 for Food Safety Management Systems-Requirements for any organization in the food chain. This system, which is being applied in Japan, can be applied to all players in food production ranging from the feed producers, primary producers through food manufacturers, transport and storage operators and sub-contractors to retail and food service outlets - together with interrelated ancillaries such as producers of equipment, packaging materials, cleaning agents, additives and ingredients. ISO 22000 is the food safety system from "farm to table."

Histamine Accumulation in Fish Sauce Fermentation in Japan

A research was conducted at the National Research Institute of Fisheries Science of the Fisheries Research Agency of Japan on controlling histamine accumulation during fish sauce fermentation in Japan, considering that fish sauce is a common and traditional condiment not only in Southeast Asian countries but also in Japan. In the production of fish sauces, small fishes are used and the long-term fermentation process takes about one year or more. In Japan, many kinds of fish are used in the production of fish sauce such as sardines, squid, sailfin sandfish, etc. Recently, fish sauce production in Japan has increased as the fishing industry tries to reduce waste by making full use of the fish materials.

As reported, large amount of Histamine (Hm) can cause hypertension, headache, urticaria, nausea and vomiting, and that Hm accumulations have been observed to occasionally occur in fish sauces and are typically the result of decarboxylation of L-histidine (His) by certain Gram-positive bacteria. In the case of the fish sauces in Japan, *Tetragenococcus* spp. was isolated as the primary Hm producer. In order to develop a method for controlling Hm accumulation, which is the main objective of the research, it was necessary to conduct a polyphasic study on the Hm producing bacteria.

The genus *Tetragenococcus* is a member of lactic acid bacteria with its main habitat the salted environments such as soy sauce mash and salted fish products, and are known as the predominant bacteria in salted fermented foods. The role of these bacteria in salted fermented food is lactic acid production and decreasing the pH, which are useful to inhibit growth of spoilage bacteria and for addition of taste and flavor to the fish sauce. Therefore, the Hm producing bacteria will produce Hm by consuming the His present in their surroundings until pH is optimized.

The results of this research study are still being scientifically analyzed. Meanwhile, observations showed that it is difficult to control contamination of Hm producing strains because *Tetragenococcus* spp., which is dominant in salted fish product fermentation, includes the Hm producing strains. Nevertheless, many middle-small food manufacturers in Japan just pass off Hm accumulation in fish sauces because there are no regulations on Hm contents in fish sauces in Japan. However, some companies reported that keeping the fermentation tanks below 25 C or above 50 C was effective to inhibit Hm accumulation.

Since controlling the temperature below 25 C or above 50 C during fermentation needs specialized equipment and occasionally results in undesirable taste, it was suggested that fermentation starter of lactic acid bacteria be used instead. This latter method could be economical and provide stable fermentation. While there is still no specific starter culture for salted fish fermentation products in Japan, some fish sauce producers use soy sauce starter as a substitute.

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