Tuna market in Japan: challenges and prospects

by Taro Kawamoto

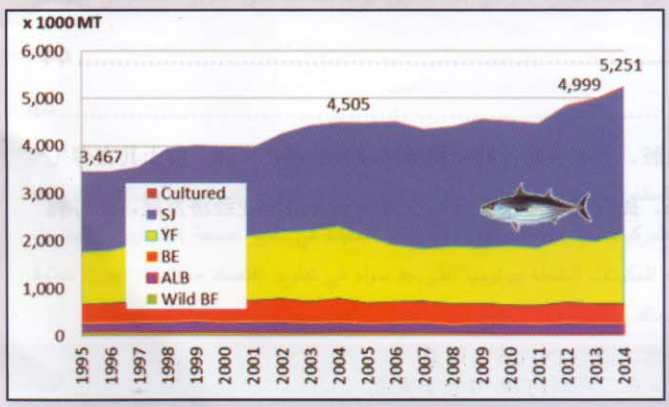
The author presents a comprehensive and updated overview of the tuna supply and consumption patterns in the Japanese market, including developing trends in the marketing of tuna products.

Pacific bluefin tuna farm at Kinki University's Fisheries Laboratory

Global supply and demand

In 2014, global production of the main tuna species Pacific bluefin, Atlantic bluefin, Southern bluefin, bigeye, yellowfin, albacore, and skipjack (not including other tunas and tuna-like species), totaled almost 5.3 million tonnes (Figure 1). This steep rise of about 1.5 times as compared to 3.5 million tonnes in 1995 was attributed primarily to the increase in purse seine catches in the tropical Western and Central Pacific Ocean (WCPO).

Fig. 1: Global production of main tuna species (BF, BE, YF, ALB and SJ)



Source: FAO FishStatJ

Global consumption of tunas in 2013 is estimated at 5.2 million tonnes (round-fish-base). The EU accounted for 1.3 million tonnes (30%), Japan 750 000 tonnes (14%), North America 580 000 tonnes (11%), South America 590 000 tonnes (11%), and the Middle East 380 000 tonnes (7%). Approximately 1.1 million tonnes (21%) of unknown tuna products, including canned tuna and sashimi tuna, may have been consumed in Asian countries other than Japan. Hence Japan still maintained its position as the single largest tuna consuming country in the world.

Supply and consumption patterns in Japan

In 2014, the longline, pole and line, purse seine and farming industries in Japan provided 460 000 tonnes of tunas, together with 272 000 tonnes of imports for the domestic market. Meanwhile, new breeding technologies for Pacific bluefin tuna have been successful, contributing to more sustainable use of wild resources.

At the same time, about 64 000 tonnes of tuna were exported to overseas markets such as Thailand. Consequently, a total of 668 000 tonnes of tuna reached the Japanese market, to be processed as canned tuna, sashimi tuna and *katsuobushi* products. These supplies were distributed by specialised channels, including local fish markets at landing ports, tuna buyers and central wholesale markets such as Tsukiji.

Domestic consumption in that year was an estimated 751 000 tonnes of tuna, consisting of three main products, namely canned tuna (15%), *katsuobushi*/dried bonito (23%), and sashimi tuna (62%), including imported products (see Figure 2).

Fig 2: Three of the most popular tuna products in Japan

Table 1 shows the estimated tuna supplies and consumption by species in 2014. Approximately 464 000 tonnes of tunas were consumed as sashimi tuna, 173 000 tonnes as *katsuobushi* and 114 000 tonnes as canned tuna in 2014.

In terms of species, bluefin/Southern bluefin and bigeye tuna were mostly consumed as sashimi tuna while the bulk of the skipjack and yellowfin were consumed as canned tuna and *katsuobushi*.

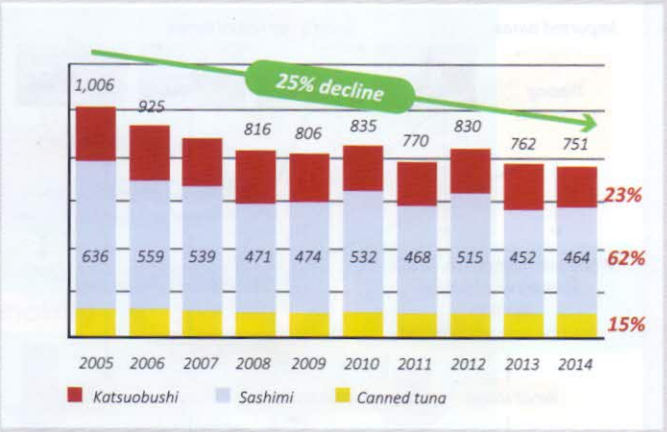
Table 1: Estimated tuna supplies and consumption by species in Japan, 2014

		Round-fish base					x 1000MT
	Species	**SJ**	**ALB**	**YF**	**BE**	**BF/SBF**	**Total**
Supply	Local catch (a)	256	62	58	55	15	445
	Cultured (b)					15	15
	Import (c)	42	16	51	127	37	272
	Export (d)	35	19	5	4	1	64
	Total (a+b+c-d)	**262**	**59**	**104**	**178**	**65**	**668**
Consumption	Canned tuna	40	0	74	0	0	114
	Sashimi	95	59	67	178	65	464
	Katsuobushi	173	0	0	0	0	173
	Total	**308**	**59**	**141**	**178**	**65**	**751**

Source: Annual Fisheries statistics, Ministry of Agriculture, Foresty and Fisheries; Japan trade statistics: Ministry of Finance; Fisheries Agency of Japan; Japan Canners Association.

However, it must also be noted that consumption per capita of tuna in Japan has actually dropped by about 25% since 2005 (Figure 3).

Fig. 3: Decreasing tuna market size in Japan, 2005 - 2014



Source : Japan trade statistics: Ministry of Finance; Japan Fisheries Information Service Center; Japan Canners Association; Annual fisheries statistics, Distribution statistics: Ministry of Agriculture, Forestry and Fisheries, Japan; Mitsubishi Corporation.

Sashimi

Tuna used for sashimi originates from the domestic fisheries industry, namely longline, pole-and-line, purse seine, and farming, together with imported tunas from all over the world. Most of the locally harvested tunas are unloaded in fish markets at landing ports such as Yaizu and are sold by auction as well as through negotiations with tuna buyers. The raw fish is processed into several kinds of sashimi products, such as loins, blocks, steaks, *negitoro* (minced tuna) and *tataki*.

A portion of the domestic supplies (chilled) is brought together with imported tuna to central wholesale markets such as Tsukiji where they are sold by auction. Frozen tuna on the other hand, tend to be directly distributed by buyers

and traders. The typical distribution channels for sashimi tuna in Japan is shown in Figure 4.

Fig. 4: Distribution channels for sashimi tuna in Japan

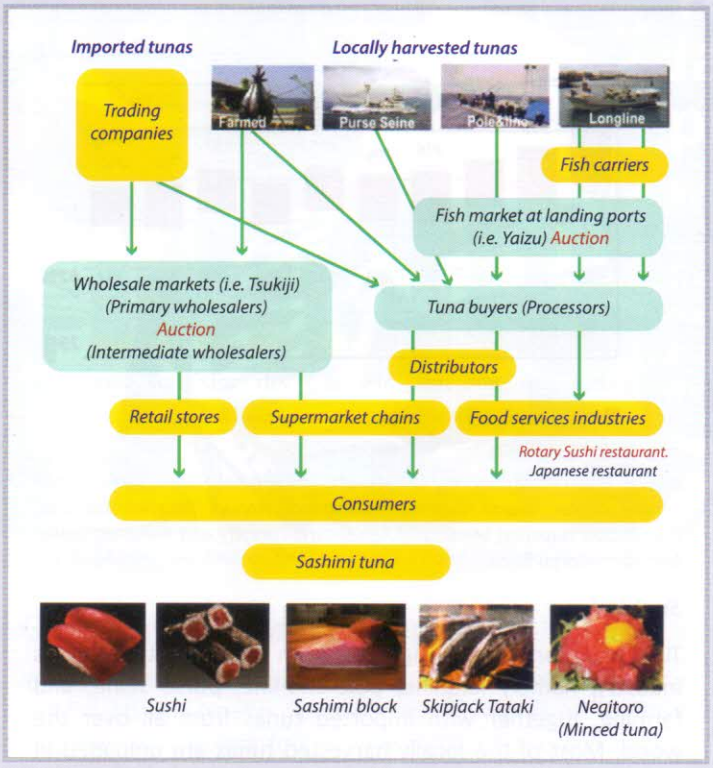
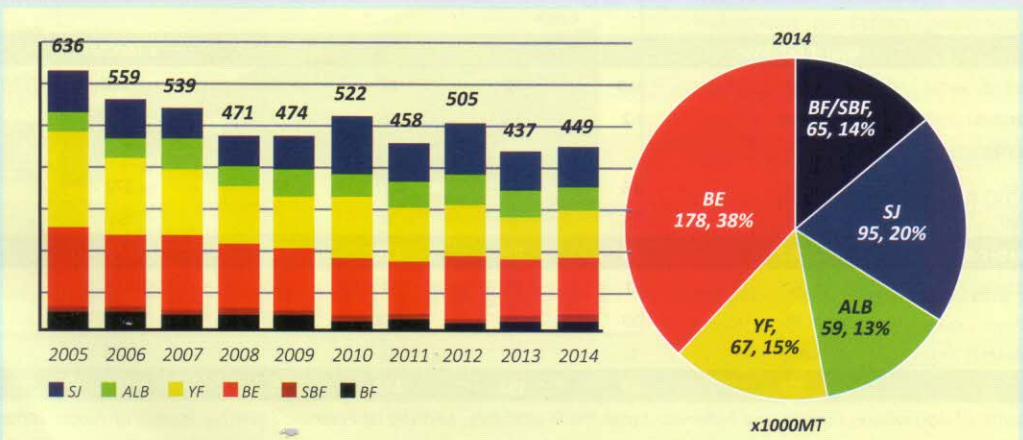


Figure 5 illustrates the estimated sashimi tuna supply in Japan (round-fish-base) in the last decade, with the downward trend being clearly visible from 2005 (636 000 tonnes) to 2014 (449 000 tonnes). In terms of the shares of tuna species in the sashimi market in 2014, BF/SBF comprised 65 000 tonnes (14%), BE 178 000 tonnes (38%), YF 67 000 tonnes (15%), ALB 59 000 tonnes (13%) and SJ 95 000 tonnes (20%).

Fig. 5: Estimated sashimi tuna supply in Japan

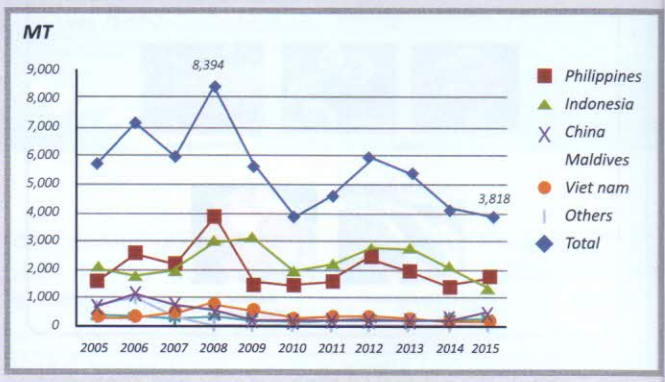


Katsuobushi

The total *katsuobushi* supply has declined since 2005 and in 2014, about 36 000 tonnes of products were distributed in the Japanese market, consisting of locally-made *katsuobushi* (30 000 tonnes; 83%), *namaribushi*, or lightly smoked skipjack loin (2 000 tonnes; 5%), as well as imported *arabushi* (4 000 tonnes; 12%).

Figure 6 illustrates that approximately 3 818 tonnes of *arabushi* were imported into Japan in 2015 from mainly Asian countries such as Indonesia, Philippines and China. The Maldives also exported some *katsuobushi* products to Japan, which were priced higher than those from other countries because of the product quality (the use of low fat fish harvested in the Indian Ocean).

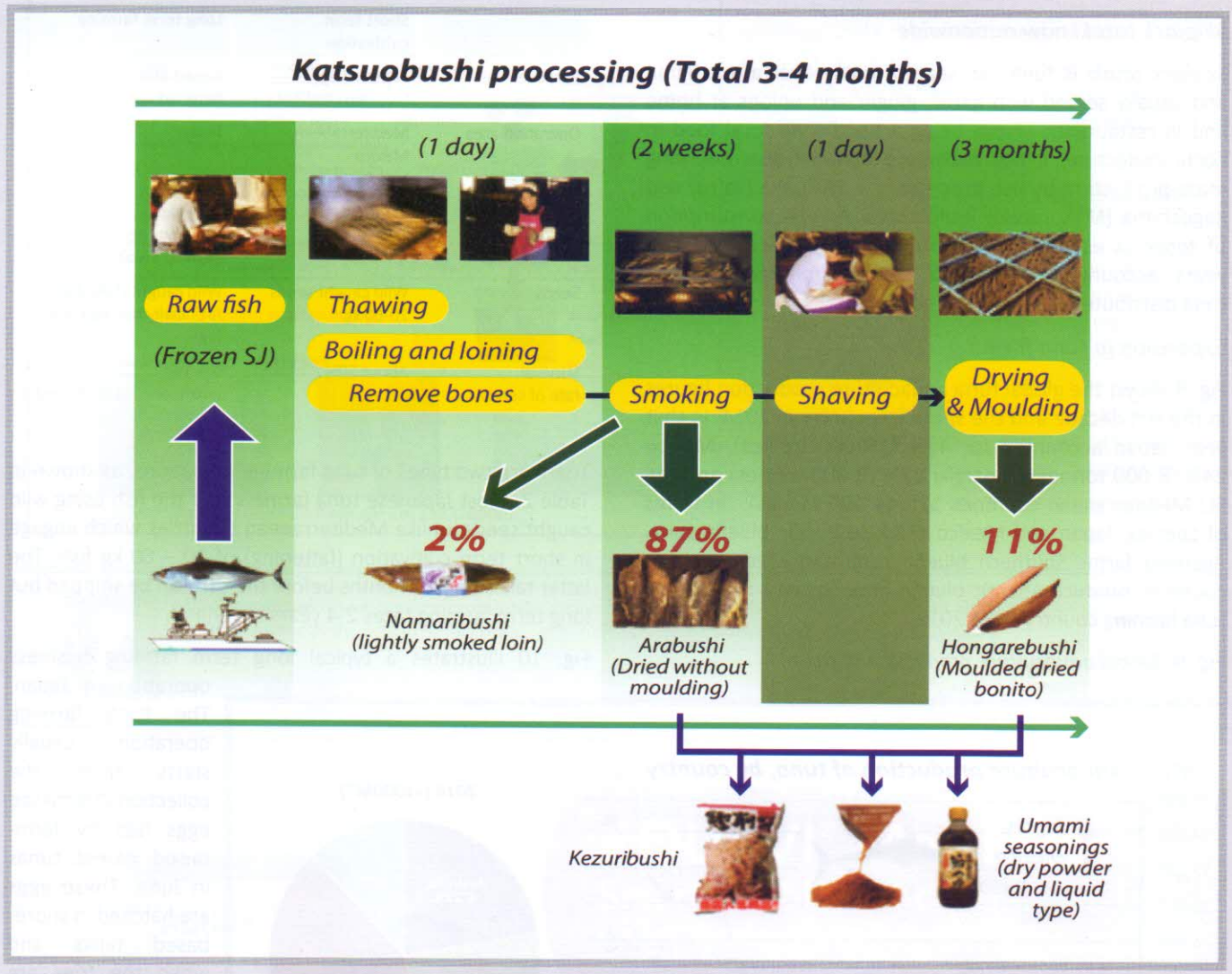
Fig. 6: Katsuobushi imports into Japan



Processing methods for *katsuobushi* products are outlined in Figure 7. Generally, frozen skipjack tuna are used. Defrosted, cleaned raw fish are boiled at 90°C for 60 to 90 minutes, and their bones and skin removed. The fish meat is then put into smoke chambers fired by hardwoods such as oak, with a part of the end product being marketed as *namaribushi* (lightly smoked loins). Many processors repeat the smoking process for about two weeks to produce *arabushi*.

Some processors go on to produce *hongarebushi*, which is created by the application of a mould (fungus) on the *arabushi* and repeated sun-drying over a period of three months. According to the *Katsuobushi* Industry Association in Japan, about 87% of *katsuobushi* products are *arabushi*, with *hongarebushi* comprising 11% in 2014. Much of the

Fig. 7: Katsuobushi processing methods in Japan



arabushi and *hongarebushi* is shaved and packed into plastic bags, and distributed to consumers as so-called *kezuribushi*.

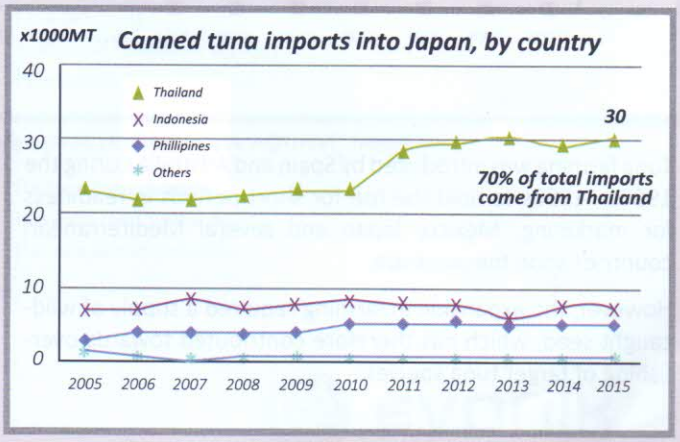
Such *katsuobushi* products are also utilised as *umami* (savoury) seasonings in powdered soup stock and liquid type dipping sauces for noodles.

Canned tuna

Approximately 42 000 tonnes (55%) of canned tuna (mainly skipjack and yellowfin) were imported from overseas and 35 000 tonnes (45%) were produced locally in 2014. However, its consumption in Japan has dropped by 14% in the last decade.

The main exporters of canned tuna to Japan are Thailand (70%), followed by Indonesia and the Philippines (Figure 8).

Fig. 8: Imports of canned tuna, by origin



New developments in Japan

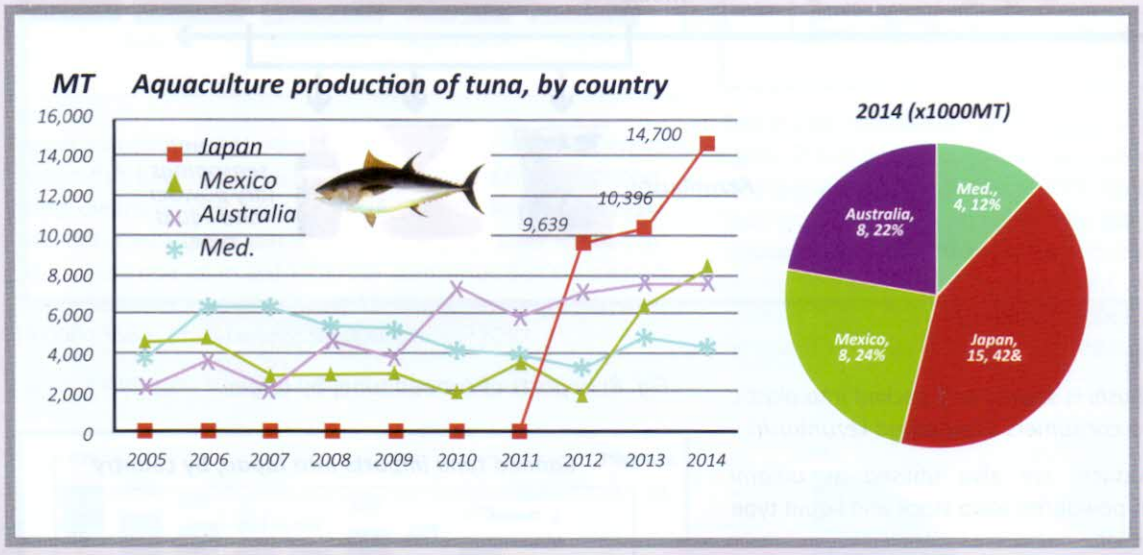
Skipjack tataki now nationwide

Skipjack *tataki* is tuna loin seared briefly over a hot flame and usually served with garlic, ginger and onions at home and in restaurants. From being a handmade local food in Kochi Prefecture, it has become a national dish following mass production by fish processors in Shizuoka (Yaizu) and Kagoshima (Makurazaki) Prefectures. Annual consumption of *tataki* is estimated at about 26 000 tonnes in recent years, accounting for 70% of the sashimi-grade skipjack tuna distributed in the Japanese market.

Expansion in tuna farming

Fig. 9 shows the global tuna aquaculture production figures in the last decade and the share by country in 2014. In that year, Japan accounted for 42% (15 000 tonnes), Mexico 24% (8 000 tonnes), Australia 22% (8 000 tonnes) and the EU Mediterranean countries 12% (4 000 tonnes). In terms of species, Japan and Mexico produce Pacific bluefin tuna, Australia farms Southern bluefin tuna and Mediterranean countries produce Atlantic bluefin tuna. Japan is the leading tuna farming country since 2012.

Fig. 9: Global aquaculture production of tuna



Tuna farming was introduced by Spain and Australia during the 1980s - 1990s to hold the fish for short periods in readiness for marketing. Mexico, Japan and several Mediterranean countries soon followed suit.

However, the expansion in farming required a supply of wild-caught seed, which has therefore contributed towards over-fishing of target tuna species.

Table 2: Tuna farming approaches

	Short term cultivation	Long term farming
Purpose	Fattened up	Raised and fattened up
Operation area	Mediterranean, Mexico and Australia	Japan
Rearing period	6-7 months	2-4 years (depends on farming area)
Seeds	Wild caught seeds 20-60 kg	Wild caught (100-200 g) Artificially hatched seeds (1g)
Survival rate of seeds	About 50%	0.5-1% (artificially hatched seeds)

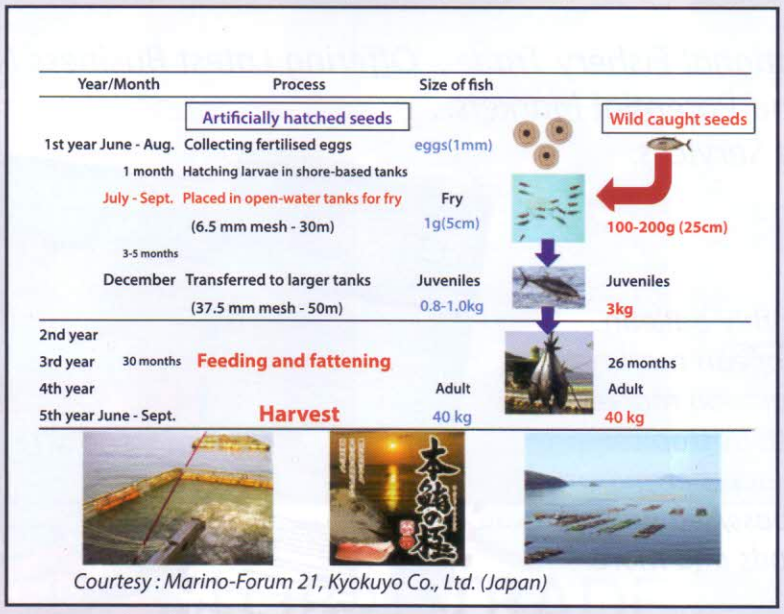
There are two types of tuna farming operations, as shown in Table 2. Most Japanese tuna farmers rear the fish using wild caught seeds, unlike Mediterranean countries which engage in short term cultivation (fattening) of 20 – 60 kg fish. The latter takes up 6-7 months before the fish can be shipped but long term farming takes 2-4 years in general.

Fig. 10 illustrates a typical long term farming business operation in Japan. The tuna farming operation usually starts from the collection of fertilised eggs laid by farm-raised parent tunas in June. These eggs are hatched in shore-based tanks and when the fries are about 1 gram, they are placed into open water tanks from July to September.

They are then transferred to larger tanks, often reaching approximately 1kg by December. The tuna is usually shipped at about 40kg size after feeding and fattening for 30 months.

Another noteworthy development in relation to the tuna farming industry is the fact that Japan has succeeded in developing a closed loop farming system (thanks to the Aquaculture Research Institute of Kindai University) to obtain artificially hatched Pacific bluefin larvae.

Fig. 10: A typical long-term tuna farming facility in Japan



Courtesy : Marino-Forum 21, Kyokuyo Co., Ltd. (Japan)

In fact, the numbers of artificially hatched seeds have now exceeded that of wild-caught seeds since 2014. However there is still a need to improve the survival rates of the former (only 1% of which can be harvested) whereas the average survival rate of the wild-caught seed is about 50%.

Increasing popularity of Japanese food abroad

Domestically, tuna consumption per capita shows a decline of about 26% in the last decade, possibly due to changes in eating habits and diet in the aging population. This trend is expected to continue over the next few decades. In contrast, Japanese cuisine is increasing in popularity in other countries as evidenced by the rising numbers of health-conscious consumer outlets.

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