

# Research on Risk Aversion of Chinese Eel Products Exported to Japan

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**Abstract.** Eel industry is most one of three export products, and is foreign exchange farming in our China. Most eels are exported to Japan in China, to protect their own eel industry, Japan always adopt measures to limit Chinese eels products export to their country, and to increase most risks in exporting to Japan. Chinese eel industry which has for the development of 20 years gradually declined, and has the risk of other countries replacing our country in export. It not only affects agricultural exports, but also to affect the livelihood of eel farmers. The relevant government departments and eel export enterprise actively adopt diversified preventive measures, and to reduce the risk of exportation, these all above are urgent to be out of trouble for eel industry now.

**Keywords.** market structure; risk root; export risk; diversified measures.

## 1 Defining the Problems

The eel aquaculture in China has been established since 1980s. As a start-up industry, it develops rapidly. So far, Chinese total output has climbed to the top in the global, which is equivalent to the 70 percent of the world. During the two decades, China has become the major producing country in eel aquaculture, processing and export. Meanwhile, it has also established the integrated industry chain, including eel fry cultivation, adult eel aquaculture, feed production, roasted eel, and by-products processing and exporting. Until now, this industry has been export-oriented. However, Japanese government starts to set some import restrictions to the eels from China in several stages with green technical barriers in order to protect their own industry and keep the political stability in recent years. Since Feb.1st 2002, Japanese inspection in live eels and frozen white roast eels begins to cover eleven drug residues, including chloromycetin. After that, the inspection scope is wider gradually. Moreover, because of import restrictions and improper propaganda of Japanese media, the sales of Chinese eels in Japanese market plummeted rapidly. On April 24th-2002, the Japanese Ministry of Public Health and Welfare (MPHW) imposed mandatory inspection on the eel product originated from China because of drug residues. Influenced by this accident, Japanese started to inspect sulfonamide that is one of drug residues in living eels. For example, living eels needs to be dried for 48 hours before customs clearance. If the inspection is qualified, the eel product in batches is permitted to enter Japanese market. Japanese measures mentioned above caused that the sale of Chinese roasted eel product in Japan plunged by 30 percent to 50 percent. On May 20th-2002, MPHWH claimed that they would impose mercury inspection on Chinese eel products and put 10 percent sampling inspection in import declaration to living eels and other byproducts originated from China. But for some countries, this figure is only 5 percent. In March 2003, enrofloxacin, one of chemical drugs, has been put into the inspection scope of white roasted eels by MPHWH. Moreover, this is not sampling inspection, but all

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products. That means every batch of eel products imported from China has to be tested. If there are more than two batches to be inspected enrofloxacin residue, Internet would publish all the inspection results immediately. In the late July 2003, China stopped roasted eels product export to Japan unilaterally, which resulted to the break of mutual trade in the item of eel products. In October 2003, China cancelled the prohibition and continued to export eel products to Japan. In 2005, eel products originated from China was stung by Japanese government because of malachite green and its media exaggerated their report that it's common for Chinese eel aquaculture to use malachite green, nitrofurans and other prohibited drugs. On May 29th -2006, Japan started to implement "Positive List System" that covered 116 inspection items to the eel products imported. Since financial crisis erupted, Japan had been taken serious trade protection on Chinese eel product. Under these strict standards, it would take longer hours for Chinese eel products in customs clearance, which led to a series of problems, such as the energy and quality of eel products becoming lower, export hindered and a great number of living eels in dull sale, great pressure in storage and the dilemma of capital turnover. These chain effects caused heavy losses to Chinese eel industry. The authorities should pay more attention to export risk of eel products.

## 2 Analysis on export risk of eel products

Eel products are big commodities in our export trade and earn a large number of foreign exchange. In 2007, the surface of Chinese eel aquaculture is more than 10,000 hm<sup>2</sup>, the output is 213,800 tons and export is 159,700 tons. So far, China has become the biggest country in eel breeding, producing and supplying. Living eel and roasted eel are the main part in our export, and more than 90% of eel products are exported to Japan. Chinese eel breeding companies mainly gather in Guangdong, Fujian, Jiangsu, Zhejiang and other provinces near the sea. (More details in Table 1)

**Table 1.** Export quantity in different regions of China in the eel growth circle of 2008 and 2009

( Quantity: Tons )

Origin	Roasted eels			Living eels		
	2009	2008	%	2009	2008	%
Total	30,042	26,216	14.6	10,546	11,430	-7.7
Zhejiang	3,516	3,789	-7.2	2,975	4,414	-32.6
Fujian	16,439	13,321	23.4	2,832	2,569	10.2
Guangzhou	4,439	3,910	13.5	499	1,152	-56.7
Shanghai	473	777	-39.1	2,083	1,735	18.8
Jiangxi	3,853	2,852	35.1	1,669	1,395	19.6

Data Source: China Eel Website

Note: Eel Growth Circle is a period from August of one year to July of the next year.

Recently, it's common for Chinese eel products exported to Japan to be detained, rejected, receded, claimed and even termination of contracts. Part of eel products was forced to retreat from Japanese market because of pesticide residues beyond normal standards. From 2006 to 2008, 488 batches of Chinese marine products had been detained in Japan, including 35 batches of living eels, 7.1% of total marine products detained. During this period, Chinese marine products had been accused of breaking about 50 inspection criteria, such as pesticide and insecticide residues beyond standards, forbidden substance inspected, non-designated additives, bacteria and *Escherichia coli* exceeding the minimum limits. (More details in Table 2 and Table 3)

**Table 2.** Chinese Eel Product Rejected by Japan since 2006 (Part of Cases)

<b>Name of Product</b>	<b>Reasons</b>	<b>Items Checked</b>	<b>Countermeasure</b>	<b>Time</b>
Eel Products	Unqualified composition and specification	Positive Escherichia coli group	Detained	Aug.7, 2006
Living eels in aquaculture	Unqualified composition and specification	Residues beyond standard (leucomalachite green)	Destroyed and receded	Sep.30, 2006
Frozen conger eel	Composition disobeyed the specification standard	Positive Escherichia coli group	Destroyed and receded	Nov.23, 2006
Roasted eel fillet	Unqualified composition and specification	Enrofloxacin inspected	Detained	July 30, 2007
Frozen boiling Conger eel fillet	Unqualified composition and specification	Furazolidone inspected	Detained	Aug.1st, 2007
Living eels	Unqualified composition and specification	Furazolidone inspected	Detained	June.30, 2007
Roasted eel fillet	Unqualified composition and specification	Leucomalachite green inspected	Destroyed and receded	July 19, 2007
Roasted eel fillet	Unqualified composition and specification	Leucomalachite green inspected	Detained	Aug.14, 2007
Roasted eels	Unqualified composition and specification	Leucomalachite green inspected	Destroyed and receded	Aug.29, 2007
Roasted Eel fillet	Unqualified composition and specification	Enrofloxacin inspected	Detained	Sep.10, 2007
Living eel	Unqualified composition and specification	Furaltadone hydrochloride inspected	Destroyed and receded	Jan.11, 2008
Roasted eels	Unqualified composition and specification	Ciprofloxacin inspected	Detained	Jan.30, 2008
Living eels in aquaculture	Unqualified composition and specification	Leucomalachite green inspected	Destroyed and receded	July 2, 2008
Living eels in aquaculture	Unqualified composition and specification	Leucomalachite green inspected	Destroyed and receded	July 17, 2008
Living eels	Residues beyond standard	Dicofol inspected	Detained	Jan. 5, 2009
Roasted conger eel in frozen	Disobeyed specifications in composition	Positive Escherichia coli group	Detained	Feb. 7, 2009
Roasted eel	Unqualified composition and specification	Enrofloxacin inspected	Discarded and receded	April, 2009
Roasted eel	Unqualified composition and specification	Enrofloxacin inspected	Discarded and receded	April, 2009
Roasted eel in frozen	Disobeyed specifications in composition	Furazolidone inspected	Detained	May 3, 2009
Roasted eel	Unqualified composition and specification	Enrofloxacin inspected	Discarded and receded	July, 2009
Living eels in aquaculture	Unqualified composition and specification	Leucomalachite green inspected	Discarded and receded	July, 2009
Living eels in aquaculture	Unqualified composition and specification	Colorless malachite green inspected	Discarded and receded	Jan. , 2010
Roasted eels	Unqualified composition and specification	Malachite green inspected	Discarded and receded	Feb. , 2010
Roasted eels fillet in frozen	Disobeyed specifications in composition	Leucomalachite green inspected	Discarded and receded	Feb. 28, 2010
Roasted eels	Unqualified composition and specification	Furazolidone inspected	Discarded and receded	May, 2009

Data source: Information originated from China Eel Website

**Table 3.** Inspecting Batch No. of Japanese Institution Detained Chinese food

Inspecting Organization	Batch No.	Percentage	Inspecting Organization	Batch No.	Percentage
Osaka	33	19.3	Moji	12	7.0
Tokyo	26	15.2	Fukuoka	11	6.4
Yokohama	13	7.6	Nagoya	10	5.8
Kobe-2nd	13	7.6	Kawasaki	9	5.3
Tokyo-2nd	9	5.3	Kansai International Airport	2	1.2
Narita International Airport	7	4.1	Shimizu	2	1.2
Niigata	6	3.5	Yokkaichi	1	0.6
Kobe	6	3.5	Sendai	1	0.6
Naha	5	2.9	Otaru	1	0.6
Hiroshima	4	2.3			

Data source: China Eel Website

Notes: Kobe-2nd is the abbreviation of the second inspecting organization in Kobe; Tokyo-2nd is the abbreviation of the second inspecting organization in Tokyo.

### 3 Analysis on the reasons of export risk of eel products

#### 3.1 Political bias

The goals of governmental policies usually are the creation of synthetic effects. Japan is a mature and developed market with relative closure. In history, the country has been in a tradition to protect its agriculture and farmers play an important role in Japanese political and economic life. In addition, there is a large of population in agriculture of China. So imposing green trade barriers on Chinese products in agriculture is an effective strategy with small investment. To some extent, Japanese trade barriers on Chinese products reflects political bias. Japan has established good relations with South Korea and Taiwan. Marine product like clam from South Korea caused some problems and a few customers had a bad attack of diarrhea, but it didn't affect bilateral trade in this way. Japan still imports marine products from South Korea. Taiwan is also a beneficiary. Based on mentioned above, we may find out some marks of political force in the trade.

#### 3.2 Solo export market

The sale of eel products in Japan is about 100,000 tons, including 20% from domestic supply, 70% from main land of China and 10% from Taiwan. In the past decades, Chinese eel market almost had been dominated by Japanese demand, which led to passive production in our eel industry. To Chinese producing companies, they had no choice but to act on the disposal of Japanese market. For example, the quality of living eels must obey Japanese standards in aquaculture and export, and even the taste of roasted eels also would be customized by Japan. As a result, the demands from other markets were ignored completely. In recent years, sale strategies of Chinese eels have been influenced by Japanese

Positive List System. In the course of breeding and processing, Japanese criteria are in the primary position. Meanwhile, our sale models are basically implemented with the help of Japanese import organizations. Therefore, solo market structure is facing great trade risks. ( More details in Table 4 )

**Table 4.** Quantity of Chinese Eel Products Exported to Japan

Eel Growth Circle	Export in total (MT)	Export to Japan(MT)	Percentage
2005-2006	25,933	22,508	86.8
2006-2007	37,711	31,458	83.4
2007-2008	18,195	11,567	63.6
2008-2009	17,072	9,923	58.1

Data source: China Eel Website

Note: Figures mentioned above covered the period from September of last year to April of next year.

### 3.3 Higher inspection standards

On May 29, 2006, Japan started to implement Positive List System that covers agricultural chemical residue criteria in food and adopted new residue limitation standards. Compared to the past regulations, new standards are more complete, systematic and strict. After that, Japan would put forward new testing items every year, so the inspection ratio is higher gradually. From 2006 to 2009, many spots were found out in the course of inspection each year, which caused that Chinese eel products exported to Japan decreased every year and inspection ratio per 10,000 tons is upward rapidly, from 1.46 times to 9.78 times. We may forecast that Japan probably will take more inspection items to eel products from China to protect its domestic industries in the future. Perhaps Japan is going to set up inspection items in the following aspects, such as making full use of Positive List System to monitor eel products from China, turning the items with overload into compulsory testing. Of course, some food safety issues exposed by our domestic media might also get Japanese attention and it possibly combined application technology related to those issues with import regulation on eel products. Besides, Japan often collects special information about eel aquaculture and processing through communication and visit and further takes relevant actions to influence Chinese eel export.

### 3.4 Japanese consumption decreasing

Because of uneven quality of Chinese roasted eels, many Japanese consumers hold serious bias to the eel products imported from China. Moreover, several industrial associations in Japan usually amplify those hot spots and a few media also exaggerate or mislead consumers on purpose. That's why a lot of Japanese consumers will keep far away from brands "made in China". According to a public survey on July 22, 2008, more than 40% of Japanese consumers just choose eel products supplied by domestic companies so that Chinese eel products with lower price and higher quality are in trouble. In the eel growth circle of 2008, roasted eels exported to Japan decreased to 17,000 tons, no more than a half of that in the eel growth circle of 2007. Japanese yearly eel consumption is 70,000 tons to 120,000 tons, but in recent years the consumption decreased to about 60,000 tons (the quantity of living eels) from the summit of 100,000 tons to 130,000 tons. Under this circumstance, Chinese eel export to Japan is also on the downward path.

## **4 Diversified countermeasures to avert export risk**

### **4.1 Developing domestic market**

Eel products are the pillar industry in our aquaculture and play an important role in export trade, but it also confronts many challenges, such as solo market structure, which mainly counts on Japan, technical trade barrier updating in foreign countries, RMB appreciation and more tight credit. All the influential forces mentioned above lead to the hard transformation of export companies. Under this circumstance, they have no choice but to develop our domestic market to get more independence. Meanwhile, domestic customers can afford eel products. Now the demand of Chinese market in eel product is very small. In our view, the main reason is that most Chinese still haven't realized nutrition and positive effects of eel product. The latest report indicates that Chinese eel consumption is less than 32 grams each year and Japanese is more than 1,000 grams. That means our domestic market has great potential. The key is how we can get it. Therefore, export companies should take diversified propaganda to broaden our domestic market and change customers' traditional ideas in eel consumption. For example, in order to broaden domestic market, eel industry in Guangdong held a series of display and promotion in Shenzhen and Beijing and got some positive effects. Active brand propaganda creates more opportunities for domestic customers to touch and understand eel products and significant transparency can also win the trust of domestic market. Further, eel industry will be able to establish good brand image in the hearts of customers. With more export risk of eel products, broadening domestic market possesses great significance. So, export companies should adjust their sales strategies, change export market structure, broaden domestic market, hold global promotion, develop new eel products suiting Chinese consuming habits, improve cooking techniques, propagandize the knowledge of eel nutrition and cultivate Chinese eel culture. All these actions will help eel and relevant products with high nutrition enter the daily consumption of our citizens.

### **4.2 Taking diversified export strategies**

Chinese eel export almost relies on Japanese market and the solo market structure also causes more risks. So, eel industry should develop international market (ex-Japan), such as Hong Kong, America, European Union and other regions with great potential. According to institutional statistics, European market's yearly consuming is near 20,000 tons, but the supply of its local aquaculture is less than 10,000 tons. Moreover, it's necessary to avert trade risk of solo market by developing international market (ex-Japan). In order to solve the problem, eel industry still has a long way to go. For example, we should hold extensive propaganda and ask the help from other industries and companies. Therefore, we suggest that authorities help industrial association apply for special funding to broaden global market, send professional groups to have propaganda in Russia, U.S., E.U., Middle East and other markets. Meanwhile, they may coordinate R&D organizations and companies to develop new product, which can meet different requirements of those markets. So far, eel industry in Fuqing has developed diversified markets, such as America, South Korea, Philippine, Malaysia, Hong Kong and other regions. Japanese market share in total export of Fuqing eel products has decreased to 63% from 80% and nearly a quarter has been exported to other regions, which diluted export affects caused by Japanese market and decreased trade risk.

### **4.3 Promoting security regulation model of eel industry**

For eel aquaculture, it's very essential to improve advanced management modernization and promote security regulation model. Firstly, GAP system should be introduced and promoted widely in eel's breeding stage. Secondly, GSP system should be adopted in operating stage, and that means aquatic companies' fishing usage must obey industrial standards in purchasing, inspecting, pricing and allocating. Thirdly, HACCP would be established in processing stage. The authorities may help those producing enterprises to establish, handling and improving HACCP system. Fourthly, ID tracing

system might be introduced in tracking stage of eel products. By developing and using ID tracing software system, eel industries are able to achieve informational management in breeding and processing. If the breeding, drugging, processing and tracing could be paid more attention, eel industry are able to improve the product's quality and efficiently cope with frequent technical trade barriers set by foreign countries.

#### **4.4 Increasing technique direction and perfecting quality standard**

Taking local environment and climate into considerations, the authorities would enhance those standards in aquaculture technology, feed purchasing, drug ratio and residue, processing of roasted eels, quality inspection and other management. In order to help producing companies adopt standard management knowledge and strengthen inner management, industrial association may hold standard training of quality management according to eel's growth stages. Besides, the authorities should walk into every breeding corporation, strengthen the spot checking of product quality in total procedure, guide breeding corporations to act on serious criteria, get rid of antibacterial agent and other forbidden drugs and promote green breeding. Then, it's also responsible to help export companies to touch latest quality standards and drug residues limitation in target markets, and they can have precautions before the crisis. On the other hand, the governmental organization might sign security contract of standard quality with every breeding corporation and establish quality file.

#### **4.5 Further processing in diversified market, developing new sets of eel products and spurring market demand**

If a product wants to obtain customers' trust and take larger market share, it must be able to meet consumers' multiple demands, especially in the domestic market. One of eel production strategies is diversification. For example, producing companies may design their products according to the requirements of customers in different countries, like Japan, Russia, America and European Union. Eel products enjoy high reputation and are regarded as aquatic ginseng. Their meats are not only fresh and tender, but also rich in protein, vitamin A, D, E, minerals and unsaturated fatty acid DHA and EPA. For example, eel products have special nutrition and are rich in DHA and EPA, which are important nutritional elements to stimulate the intelligence of children. Based on this point, producing companies could develop new sets of eel production for the pregnant, baby and child. For instance, they may use roasted eel as main materials, and combine these particular roasted eels with fresh vegetables, fruits and monosodium glutamate to make delicious ingredient, or dip eel meat into the juice of donkey hide gelatin to make innovative product—roasted eel with donkey hide gelatin, which is rich in nutrition and with good taste, or transform eel products into micro-wave products, which are rich in nutrition and can be stored for a long time. It is not only portable, but also no needs to be cooked and people may eat it directly. Recently, a beverage made from eel essence landed on Japan. It is abundant in vitamin and consists of eel essence. This magic beverage can help people quench thirst in hot summer. Moreover, processing companies can also make different sets of dishes with eel according to eight dishes in China. On the one hand, it's able to meet various tastes of customers. On the other hand, it's good to spur the demand in domestic market.

#### **4.6 Innovating marketing model**

Accurate positioning is the key to avert trade risk and broaden markets, because eel products are usually considered as high-end nutritional food. In my view, market positioning of Chinese eel products could focus on provinces with strong economy and customers in high and middle level. Besides, we should get major breakthrough in marketing of other aspects. For example, those flights to big cities are good choice, like the airline from Guangzhou to Beijing and Shanghai. We could offer one or two slices of eel fillet in flight dinner. There are so many flights and it's really huge market. At the same time, processing companies can make some beautiful presents by roasted eel products with

different tastes to exploit new markets. Furthermore, they may enter restaurant industry, especially in high and middle end, to increase the market capacity.

#### 4.7 Strengthening official support

The future of eel aquaculture is not so bright in China. In order to deal with trade barriers implemented by Japan for our eel products, governments should take more effective measures, such as canceling value-added tax of roasted eel in domestic to cultivate inner market and free charge in the testing of materials and semi-products to reduce the burden of enterprises. Moreover, the authorities should improve collaborative institution for the export of eel products, actively cope with export disputes, and take effective measures matching with the rules and conventions of international trade. They can also make policies to support domestic market by finance, tax and technique service and promote eel export in product development and governmental service, such as dealing with technique trade barriers.

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