



Characteristics of Japanese Soy Sauce

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Its root is *kokubishio* from China.

The origin of Japanese soy sauce is believed to be *hishio* (*jiang* in Chinese), which is the juice of food preserved in salt. Ancient people lived by hunting, and had food only when they caught game. *Shishibishio* (meat-based *hishio*) was likely accidentally invented when salt-curing meat. With the shift to agricultural, it is believed that *kokubishio* (grain-based *hishio*) was created by mixing grains with salt, and that the production method was brought to Japan from China along with Buddhism. Although the route by which *kokubishio* came to Japan is uncertain, I believe it arrived in Kyushu (southwestern Japan) via the Korean Peninsula. Korea and Kyushu are closely related, and soy sauce produced by a blending method in which hydrolyzed vegetable protein is added to *kiage* soy sauce (unpasteurized soy sauce) is common in both places today. As noted in an account in the Taiho Code, enacted in 701 A.D., *hishio* was made using soybeans by the *hishio* staff of the banquet food section of the Ministry of the Imperial Household. Thus, *kokubishio* took root in Japan.

Over the course of time, the *kokubishio* adopted from China underwent modifications in Japan, and eventually a soy sauce unique to Japan was born. Although we cannot know exactly how it was created, due to a lack of written records, *misho* is said to have been born from *hishio*. Judging from the pronunciation, it is likely that *misho* was the ancestor of *miso* (fermented soybean paste). Liquid that seeped out from *miso* in the barrel is thought to have eventually become a liquid condiment, soy sauce (*tamari* soy sauce). Another theory holds that, in the Kamakura period (c.1185–1333), a Zen monk named Kakushin (1207–1298) brought back the production method of Kinzanji *miso* from Kinzanji Temple (*Jingshansi* in Chinese) in China, and the liquid that accumulated in the bottom of the barrel during its production became soy sauce (*tamari* soy sauce). In any case, there seems little doubt that soy sauce was born from the liquid byproduct of miso production. As such, the Japanese soy sauce with the longest history is *tamari*, which was first brewed in Kansai (western central Japan) around the end of the Muromachi period (c.1336–1573).



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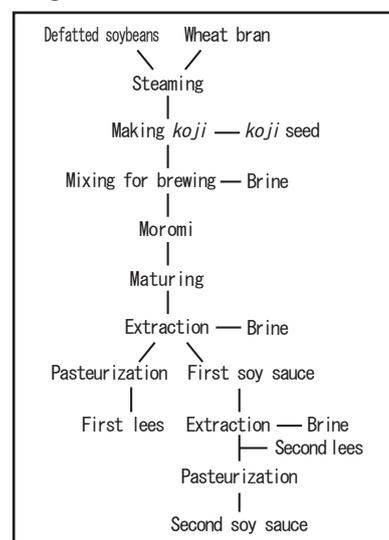
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With the beginning of the Edo period (1603–1868), Japan's center of culture moved from Kyoto to Edo (present-day Tokyo), and saw the emergence of *koikuchi* (dark) soy sauce preferred by people in Edo. The then-conventional soy sauce, *tamari* (darker and thicker), was made using only soybeans as the main ingredient and was rich in *umami*. *Koikuchi* uses wheat in addition to soybeans, and has not only rich *umami* but also a nice color and flavor. Its popularity spread nationwide. Currently *koikuchi* accounts for 80 percent of all domestic production. Later, in 1660, the lighter colored *usukuchi* soy sauce was produced in Tatsuno, Hyogo Prefecture, by a method almost identical to that used for *koikuchi*. In 1781, *saishikomi* (refermented) soy sauce, a thick variety also called *kanro*, was made by mixing *koji* with *kiage* soy sauce instead of brine for brewing. This process was invented in Yanai in Yamaguchi Prefecture. In the late Edo period, *shiro* soy sauce, sweeter and lighter colored than *usukuchi*, was developed in Hekinan in Aichi Prefecture, using wheat as its main ingredient. As noted, *hishio* introduced from China underwent a unique evolution in Japan, and Japanese soy sauce is now recognized as a global condiment.

Soy Sauce in China and Korea

In China, aside from *hishio*, *shi* (*chi* in Chinese), which is made by growing *koji* mold on soybeans, has also been used as a condiment. *Shi* is now called *tochi* (*douchi* in Chinese), and oil strained from stir-fried *tochi* is used as a condiment. As *shi* is like malted soybeans in which soybeans are broken down by *koji* mold, *shi* juice obtained by extracting liquid from the mixture of *shi* with water seems to have been used as a liquid condiment similar to soy sauce, though I am not certain how soy sauce was developed from *shi* juice in China. At any rate, a Chinese-style soy sauce that is unlike its Japanese counterpart emerged. In today's China, the majority of soy sauce is produced by a low-salt solid fermentation process, which is faster and cheaper. This method was invented around 1950 to help supply China's large population. In this quick brewing method,

Figure 1 Soy sauce production process using the low salt solid fermentation method



koji is made from defatted soybeans and wheat bran. The *moromi* mash, with a moisture content as low as 50%, is left to ferment at 50 degrees Celsius for roughly three weeks, finally mixed with brine, and then extracted to obtain soy sauce (Figure 1). With its coloring having progressed through warming, this variety of soy sauce is quite unlike Japanese soy sauce. A variety similar to Japanese-style soy sauce is also produced in China using the high-salt liquid fermentation process. When I visited a soy sauce maker in China, I was surprised at the large pots used to ferment *moromi* outdoors (Photo 1). Recently, more Japanese-style soy sauce is being produced under the technical guidance of Japanese experts.

Korean homes make a Korean-style soy sauce by mixing *meju* (Photo 2) and brine in pots (Photo 3). *Meju*



Photo 1: Chinese soy sauce pot



Photo 2: *Meju* in Korea



Photo 3: Korean soy sauce pots

is boiled and crushed soybeans, which are shaped into flat blocks, tied with straw ropes and hung under eaves to facilitate fermentation with hay bacillus (*Bacillus subtilis*). Unlike Japanese soy sauce, soybeans for this homemade soy sauce are broken down by hay bacillus enzymes, which impart a unique flavor. This soy sauce is rich in umami, with a total nitrogen of 1.4%. Soy sauce makers in Korea also produce *kiage* soy sauce using the Japanese method, as the country was once occupied by Japan. Although some *honjozo* (naturally brewed) soy sauce is found on the market, soy sauce produced with the blending method in which hydrolyzed vegetable protein is added is more popular in Korea than in Japan.

Japanese Soy Sauce Production by Prefecture

Table 1 shows the results of a soy sauce production survey in 2012. Total soy sauce production amounted to 800,000 kiloliters, of which *koikuchi* accounted for 84%, *usukuchi* 13%, *tamari* 1.5%, *saishikomi* 1% and *shiro* 0.7%. Chiba Prefecture had the most *koikuchi* production, followed by Hyogo and Aichi. These prefectures are home to many leading manufacturers. For *usukuchi* production, it was no wonder Hyogo was at the top, since Tatsuno, an *usukuchi* production center, is in this prefecture. Chiba ranking second was surprising though. Chiba was the third largest production base for *tamari* as well. For *saishikomi*, Saitama was the leading producer at 1,112 kl, followed by Niigata at 1,098 kl and Gunma at 1,061 kl. (Saitama and Niigata are not shown on the table). In Saitama, *saishikomi* production amounted to as much as 28% of all soy sauce production in the prefecture. Fully 95% of all *shiro* was produced in the prefectures listed in the table. Table 1 shows only the volume produced in each prefecture, not actual consumption. Another comprehensive survey is needed to clarify regional characteristics of soy sauce consumption.

As we have seen, though soy sauce originated as *hishio*, it has developed differently in different countries. Though all soy sauce may look similar, it is actually completely different from country to country. In my opinion, the superiority of Japanese-style soy sauce will cause it to be spread further throughout the world.

Table 1 Soy sauce production survey results in 2012 (in kl) Data source: The Japan Soy Sauce Technology Center

Prefecture	<i>Koikuchi</i>	<i>Usukuchi</i>	<i>Tamari</i>	<i>Saishikomi</i>	<i>Shiro</i>	Total	Ranking in total production
Chiba	265,046	16,187	1,451	332	1,481	284,496	1
Hyogo	80,469	37,688	68	444	17	118,686	2
Aichi	40,481	2,400	6,835	973	2,305	52,993	3
Gunma	40,661	1,526	32	1,061	886	44,166	4
Kagawa	35,631	7,706	7	147	0	43,492	5
Oita	25,632	7,198	0	111	570	33,511	6
Mie	22,137	1,771	2,027	0	159	26,094	7
Hokkaido	21,874	197	0	31	8	22,109	8
Aomori	20,616	409	0	2	0	21,027	9
Fukuoka	14,913	4,186	5	305	0	19,409	10
Total in Japan	671,911	102,022	12,027	7,685	5,665	802,310	