

# Identifying the True Character of Kansai Soy Sauce

## –Report on Our “Edo Soy Sauce” Revival Project–

Recent research progress has clarified much about the soy sauce industry of the Edo period. However, until now, most research activities have focused on the history of the industry’s business management, leaving many questions regarding production technology and product quality unanswered. The reason for this lies primarily in a lack of sufficient literature remaining from that time. One subject of particular interest is the soy sauce that was produced in the Kansai region (“Kansai soy sauce”) and dominated the Edo market for most of the Edo period. Using what relevant documents were available, the Kikkoman Institute for International Food Culture (KIIFC) took on the challenge of unveiling this Kansai soy sauce.

### Kansai Soy Sauce

The most popular soy sauce in modern Japan is dark soy sauce, accounting for roughly eighty percent of domestic production. In addition to being pleasantly salty, its complex flavor has underlying tones that are at once sweet, bitter, and sour. This dark soy sauce is generally believed to have originated with the soy sauce produced in the Kanto region (“Kanto soy sauce”) that replaced Kansai soy sauce in the Edo market sometime during the Bunka-Bunsei eras (1804–1830).

The soy sauce available on the Edo market during the Tokugawa shogunate (1603–1867) underwent several transformations. With establishment of the shogunate, a thick version of Kansai soy sauce was the most common. This thick version was later replaced by a clear version of Kansai soy sauce, and by the end of the shogunate, Kansai

soy sauce had been replaced by the Kanto soy sauce produced in the Kanto region. Fig. 1 illustrates this transition.

In the early 17<sup>th</sup> century, adequate equipment for producing soy sauce had yet to be deve-

loped. The use of crude tools and methods to extract the liquid, or soy sauce, from the fermented *moromi* mash resulted in a cloudy soy sauce containing a number of impurities.

Later, the *moromi* was placed in cloth bags, which acted as filters, for extraction. This technique made production of clear soy sauce possible.

Records indicate that this adoption of a technique used in sake production began in the Kansai region sometime during the second half of the 17<sup>th</sup> century and gradually spread throughout Japan.

At the beginning of the 18<sup>th</sup> century, the Edo market still favored clear Kansai soy sauce, with



Soybeans (*Tachinagaha* variety)



The *moromi* is placed in cloth bags before it is pressed to extract the soy sauce

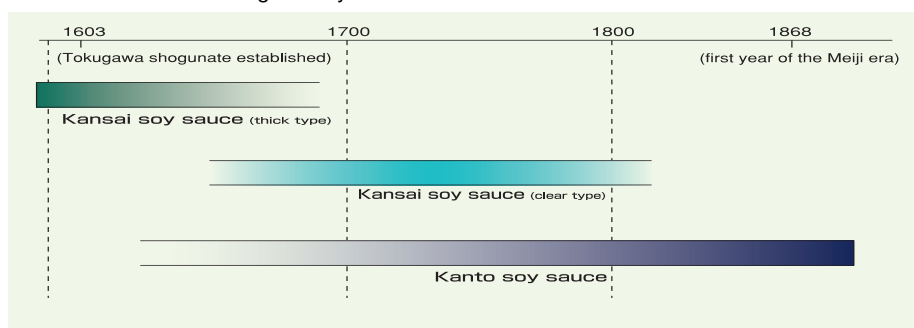


Edo-period soy sauce press (replica)



Bankin Sugiwai Bukuro

Fig. 1: Soy Sauce Transition in the Edo Market



Wheat (*a. t. aestivum* variety)



Sea salt produced by solar evaporation in Ako, Hyogo Prefecture

counterparts produced in and around Edo (Tokyo) considered inferior.

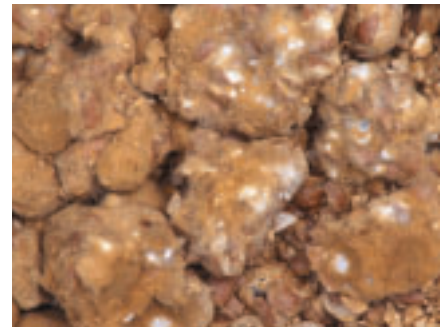
For roughly two centuries, beginning with the establishment of the Tokugawa shogunate, the soy sauce primarily consumed by the residents of Edo was delivered from the Kansai region.

So what was this Kansai soy sauce? Unfortunately we have no way of truly knowing, as there are very few records remaining regarding production at that time, though there is much speculation. With assumptions based on very limited resources, we believe that the original Kansai soy sauce was the thick type. Information regarding the clear type that later emerged remains obscure. In any event, details of the clear type of Kansai soy sauce that became widely used in Edo following the thick type are pure speculation. However, because Kansai soy sauce played such an important role in the history of soy sauce development, leading first to the development and rise of Kanto soy sauce and finally to the dark soy sauce we see today, we believe that clarifying the characteristics of clear Kansai soy sauce is important. That is why we at the KIIFC formed a special project team and spent a year and a half, beginning in July 2003, to define a true image of Kansai soy sauce.

The project team first studied various approaches that might help to identify the true character of Kansai soy sauce with review of materials written at the peak of Kansai soy sauce's

popularity. As a result, they concluded that the soy sauce should be produced based on the method introduced in the book *Bankin Sugiwai Bukuro* published in 1732, and obtain firsthand information from the soy sauce thus produced for the following reasons:

1. The production method should be from a document written when Kansai soy sauce was most popular, presumably during the first half of the 18<sup>th</sup> century, as such a reference would most likely describe the standard production processes of the time.
2. The document describing the production process should be as detailed as possible.
3. Discussion of the character of the soy sauce should not be based only on descriptions found in documents from that time because accurate evaluation is only possible by actually seeing, tasting, and smelling the soy sauce. For this reason, the project team believed that it was vitally important to actually produce the soy sauce.



Growing koji (*A. sojae* mold)



Adjusting the press prior to extraction



An old-fashioned stove

In light of these premises, the project team decided to follow the procedure described in the aforementioned *Bankin Sugiwai Bukuro*. The project team named this revived soy sauce, "Edo soy sauce," the name also used in this article.

### Reproducing "Edo Soy Sauce"

While the project team adhered to the procedures described in the reference as faithfully as possible in reproducing "Edo soy sauce," they occasionally came across ambiguous explanations or



Growing koji (*A. oryzae* mold)



Boiling soybeans





Soybeans are stirred constantly to prevent uneven cooking

omissions. When this happened, they referred to Kikkoman's own records regarding brewing materials and processes.

The following are some important facts to be noted regarding the revival of "Edo soy sauce:"

1. The production process was basically identical to that of today, except for the aging period and refining stage (pasteurizing of extracted soy sauce and conditioning thereafter).
2. Brewing began in midsummer (the eighteen days preceding the beginning of autumn in the Chinese lunar calendar), as specified in the reference.
3. The reference states that the incubated *koji* (mold) should be mixed with brine in midsummer and that the soy sauce should be finished at the end of autumn.



Roasting the wheat

- With late November presumably being the end of autumn, they assumed a brewing period of approximately one hundred days, or roughly three and a half months.
4. The *moromi* was stirred every day for sixty days after mixing the *koji* and brine.
  5. Manual processing went smoothly thanks to the participation of retired Kikkoman veterans and with use of facilities preserved in one of Kikkoman's old buildings, formerly the designated brewery of the imperial family.
  6. They mixed the *koji* and brine in Kikkoman's brick brewery,



Mixing the boiled soybeans, roasted wheat, and seed *koji*

which provided the optimal uncontrolled natural environment for the mixture.

7. Tools and equipment used during the Edo period were reproduced and used as much as possible in

this project.

8. Two varieties of *koji*, *aspergillus oryzae* mold and *aspergillus sojae* mold, were used to produce two varieties of soy sauce in the same manner and conditions.



Loading the mixture onto trays

9. Finally, the resulting soy sauce was used in seven dishes selected from cookbooks published at the same time as the reference (see the article "Edo Cuisine.")

Every step of the production process was recorded by high-resolution VTR with still photos by NHK Promotions, and compiled into a database. These data are presently available for public viewing in the KIIFC.

#### Examination of "Edo Soy Sauce" and Kansai Soy Sauce

Analysis results for the "Edo soy sauce" produced following the method described in *Bankin Sugiwai Bukuro* are shown in Table



Stacking the loaded trays facilitates mold incubation

1, while those of typical modern soy sauce are presented in Tables 2 and 3. Analysis of "Edo soy sauce" can be summarized as follows:

1. In terms of nitrogen level, which is a criterion for soy sauce quality assessment, the two varieties of "Edo soy sauce," one made using *A. oryzae* and one made using *A. sojae*, with nitrogen levels close to that of light modern soy sauces, are not considered savory or as having great flavor.
2. Both varieties have a high percentage of salt.
3. A short aging period for the "Edo soy sauces" results in a light color and insufficient alcohol fermentation.

From a sensory perspective, "Edo soy sauces" were found to:

1. Have flavor lacking in body and depth, probably



Making a barrel in which the incubated *koji* will be mixed with brine (the hoops are made from strips of bamboo)



Making a barrel in which the incubated koji will be mixed with brine

- due to the short aging period.
- 2. Have only a slight aroma of soy sauce due to the lower level of alcohol.
- 3. Be ill suited for dipping or as a dressing as the initial pleasant taste is soon re-

placed by a strong and salty aftertaste.

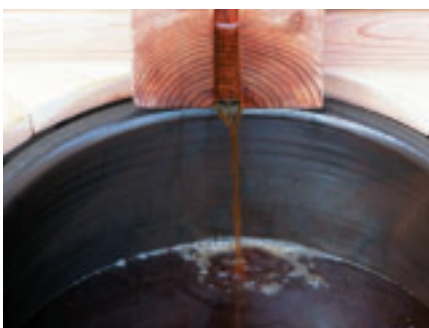
As previously mentioned, Kanto soy sauce replaced Kansai soy sauce in the Edo market during the Bunka-Bunsei eras (1804–1830). At the same time, the dishes that are generally considered typical Japanese cuisine today, such as soba noodles, sushi, tempura, and grilled eel, were established in the city of Edo. For these dishes soy sauce is a major and indispensable seasoning. It would be appropriate to say that the flavors of these dishes were finalized with the emergence of a soy sauce that suited the characteristics of the individual dishes.



Finished barrel

Assuming that the “Edo soy sauce” produced in this project is the same or nearly the same as the traditional Kansai soy sauce, we find it very difficult to imagine Japanese cuisine evolving the way it did had Kanto soy sauce not replaced Kansai soy sauce in the Edo market. Kansai soy sauce simply did not satisfy the preferences regarding color, flavor, aroma, and complexity of the people of Edo.

Now then, what was the real difference between Kansai and Kanto soy sauces? The results of this project suggest that the most important aspect was the Kansai soy sauce’s shorter brewing period. The longer the brewing period, the darker the color, the more body and depth in flavor and aroma, and the less salty the soy sauce, making soy sauces brewed over an extended time better for dipping and dressing foods. Therefore, the



Soy sauce as it is extracted

increase in the length of the brewing period is believed to be the primary reason Kanto soy sauce replaced Kansai soy sauce in the Edo market.

In light of production capability and scale during the Edo period, it would have been impossible for Kansai soy sauce brewers to produce both the Kansai soy sauce that suited their own local cuisine and the stronger, darker soy sauce demanded by the people of Edo. As a result, the Kansai brewers were unable to meet the changes in demand and were eventually replaced entirely by the Kanto brewers in the Edo market.

Table 1: Analysis of "Edo Soy Sauce"

	Salt	Nitrogen	Alcohol	Chromaticity	pH	Sugar
A. sojae	20.5%	1.25%	2.6%	36	5.0	1.9%
A. oryzae	20.2%	1.26%	2.3%	35	4.9	2.0%

Table 2: Analysis of Kikkoman’s Dark Modern Soy Sauce

Salt	Nitrogen	Alcohol	Chromaticity	pH	Sugar
16.0%	1.72%	3.1%	13	4.8	3.5%

Table 2: Analysis of Kikkoman’s Light Modern Soy Sauce

Salt	Nitrogen	Alcohol	Chromaticity	pH	Sugar
18.5%	1.19%	3.1%	35	4.8	4.3%

Sensory Evaluation: Kikkoman’s Dark Modern Soy Sauce vs. Edo Soy Sauce (paired comparison testing conducted by Kikkoman)

