

Fermentation techniques developed during the Edo Period, following the footsteps of the pioneers.



Looking at Japanese dinner tables, one might be surprised at the number of fermented foods: *natto*, pickles, salted fish guts, sake, vinegar, soy sauce, miso, and others.

Fermentation is the process of making a foodstuff beneficial to humans using the action of microorganisms (mold, bacteria, yeasts, etc.). Being "beneficial" is the essential point here, for if a foodstuff is harmful, it means it has gone bad.

Fermented foods are found in countries around the world, but few have it in richer variety than Japan. The most characteristic feature of Japanese fermented food is the use of *koji** mold, which is used in the making of sake, shochu, soy sauce, miso, sweet rice liqueur and *amazake*. It adds the good taste, improves preservative properties and increases nutritional value. It is indeed a blessing supporting Japanese food culture. The hot and humid climate of Japan has provided favorable environments for molds to grow, which may account for such a great variety of fermented food.

Of the fermented foods that use *koji* mold, sake is the most well known. Sake brewing has been practiced since ancient times, but it was during the Edo Period that *sandanjikomi* (three steps addition) was established, and this became the foundation for modern sake brewing techniques. In this method, the *shikomi* process, in which *koji*, steamed rice and water were added when making the *moromi* containing alcohol, was carried out in three separate steps to prevent propagation of germs, thus establishing a stable fermentation technique.

Amazake, one of the favorite fermented foods in the Edo Period, is also made from rice and *koji*. Though it is mostly consumed in winter nowadays, people of Edo often enjoyed it during the summer as a highly nutritious drink perfect for preventing summer fatigue.

Katsuobushi is known as the hardest food in the world. It is a fermented food made from bonito to which a kind of *koji* mold has been added. First, the bonito is smoked and then dried before adding the mold. The "smoke and dry" method was invented during the Edo Period, and this technique, after many improvements, was established as a processing method almost equivalent to what we use today. Mold absorbs moisture from the inside of the bonito and brings out the good taste. This is the source of the delicious broth that brings such a rich taste to Japanese food.

Today, the mechanisms of fermentation are well understood, and the questions of why good sake is produced or how *amazake* and *katsuobushi* are made have been solved. But surprisingly, during the Edo Period, these were still unexplained phenomena, and furthermore, people did not even know of the existence of microorganisms, the keystone of fermentation. Nonetheless, our forebears had sufficient knowledge to utilize the amazing power of fermentation, and their experience alone led to today's fermentation techniques.

The fermentation techniques developed during the Edo Period are a technology that has unlimited potential for the future.

**Koji*: Formation of mold or other microbes that grow on polished rice or bran

[9 - Fermentation]

TECHNOLOGY IN THE EDO PERIOD



Scene of sake brewing during the Edo Period

Depiction of how sake brewing was carried out carefully by hand. During the Edo Period, it was discovered that winter was the most suitable fermenting season for good sake brewing and the *kanzukuri* method is also one of the traditions we still follow today. They also developed advanced technology such as firing to enhance its preservative properties.

Sake brewing in the Edo Period

1. Rice Steaming

Polished rice is steamed in a wooden barrel called a *koshiki*

First, the rice is polished and washed clean. Then it is soaked in water before it is steamed in a *koshiki*. The starch contained in the rice changes during steaming to a state more suitable for the propagation of *koji* mold.



2. Making of *koji*



Koji mold

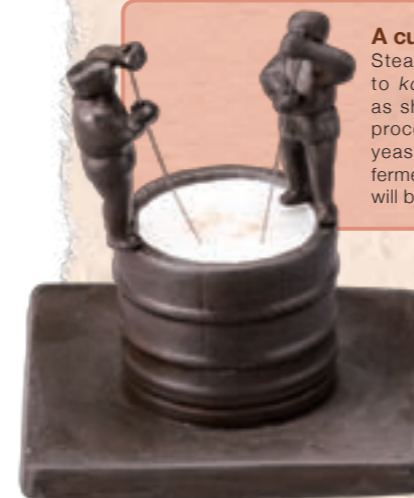
Keystone of sake! Making of *koji*

Koji mold is added to steamed rice and kept in a hot and humid space called a *koji muro* (*koji* incubation room) to culture. As the *koji* mold grows, *koji* is formed. It is this crucial process that determines the brewing of sake.

3. Making of *moto* (starter mash)

A culture of yeasts

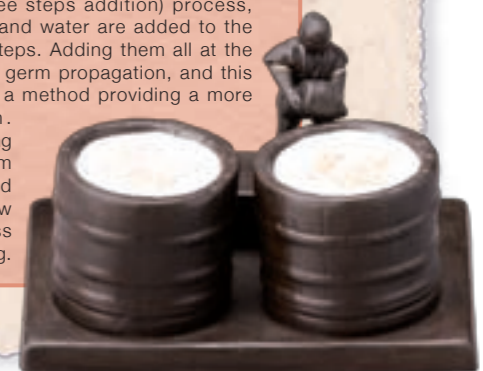
Steamed rice and water are added to *koji* to make *moto*, also known as *shubo* (mother of sake). This is a process culturing a large quantity of yeasts which will undergo alcoholic fermentation. As its name indicates, it will become the origin (*moto*) of sake.



4. *Shikomi* (brewing)

The final stage of sake making is the fermentation of yeasts

In the *sandanjikomi* (three steps addition) process, more *koji*, steamed rice and water are added to the *moto* in three separate steps. Adding them all at the one time runs the risk of germ propagation, and this method was invented as a method providing a more stable fermentation. Gradually, *moromi* containing alcohol is formed, from which liquid is extracted and pasteurized at a low temperature. The process is complete after maturing.



Fermented foods holding remarkable power



Amazake (sweet rice drink)

A book written during the Edo Period describes the scene of an *amazake* seller in summer. Sweet and mild, *amazake* is rich in nutrition such as vitamins, minerals and sugar, making it the perfect food for preventing summer fatigue.



Katsuobushi (dried bonito)

Being the hardest food in the world, *katsuobushi* is too tough to cut or slice except with a special wood plane. A book from the Edo Period, the *Honcho Shokkan* (Mirror of Food in our Country), describes *katsuobushi* as having special qualities good for digestion and acting as a life-energy and blood supplement.



Natto

Natto began to be consumed widely by ordinary people during the Edo Period. At that time, boiled soy beans were packed in rice-straw wrappers and kept warm so that the *natto* bacteria living in them would propagate. *Natto* is a highly nutritious food and remains a standard dish for breakfast today just as it was in the past.