



SAKE RICE MILLING

The very latest developments in a fast growing industry

by Nobuaki Niiyama, Head of Sake Rice Department, Plant Division, Satake, Japan

Rice is one of the main ingredients in the brewing of the Japanese rice wine known as sake. Throughout the drink's history, sake brewers have taken great care to perfectly mill their rice.

The first revolution in milling sake rice came in 1896, when Ri'ichi Satake, founder of Satake, introduced the first power-driven rice milling machine in Japan. It was 40 times more efficient than man-powered equivalents.

Then, in 1908, Satake invented a new circulation type rice milling machine that prevented the rice from breaking during the milling process. This invention resulted in the birth of Ginjo, the first premium grade sake with a milling degree (the proportion of the grain left after milling) of 60% or less. Since then, sake brewers have sought ever higher quality by milling grain to a

finer and finer degree, resulting in additional premium grades like Dai-Ginjo with a milling degree of 50% or less.

Staying profitable & competitive

There are currently over 1000 sake breweries in Japan, 90% of which are small operations. The remaining 10% are large sake breweries, which account for over 50% of the total sake production. In recent years, the consumption of sake in Japan has been decreasing. This decline is attributed to reduced population growth, aging, and an increasing variety of alcoholic beverages on the market.

To stay profitable and competitive, small sake breweries are shifting focus from quantity to quality and are producing more and more high-quality sake at higher prices.

Recognised & appreciated globally

Sake brewers have also taken a cue from French wine exporters and have moved to export their sake. As a result, along with the spread of Japanese food, sake is gaining recognition overseas and export volume is steadily increasing.

Japanese Ministry of Agriculture, Forestry, and Fishery announced sake export in 2021 exceeded 35 billion JPY (US\$301.6m), doubled in five years. Initially, sake was perceived to be similar to Western-style white wine, but recently, the value of the "multiple parallel fermentation" brewing method, a fermentation method rarely used abroad, is being recognised and appreciated globally.

Since rice does not contain sugar, brewing sake requires converting the starch into glucose before immediate conversion into alcohol in the same container. For this unique Japanese beverage to continue growing in popularity outside Japan, its cost is a key barrier.

Under the current situation, sake becomes more than three times more expensive when exported overseas. It is distressing that consumers, especially those who have learned to appreciate the





taste of sake overseas, are unable to enjoy it affordably.

To realise a larger market both domestically and internationally, production costs need to be reduced. Improved milling technology can go a long way to making this happen.

The process takes a long time

Traditionally, sake rice is milled using a technique called spherical milling. This technique leaves only the spherical core of the grain intact. This is because delicious sake can only be brewed by removing the unwanted outer layer of the rice which is rich in proteins and lipids. Only the pure starch at the center should remain. The longer the protruding part of the rice contacts the grinding wheel, the more the rice is polished and so the more round the rice becomes.

However, the starch in the rice is not always spherical in shape and can vary depending on the rice variety. Some starch can be saucer shaped or oblong, leading to large losses when milled using the spherical milling technique.

A better method for milling sake rice is therefore to mill in a way that maintains the shape of the starch. With conventional milling equipment, it is necessary to mill with a low milling stone rotation speed to prevent the rice from breaking. The process takes a long time and as a result virtually no one in the industry has chosen to use this milling method.

Producing the highest quality sake

To meet the need of Japanese brewers to continue producing high-quality sake at an affordable cost, Satake has developed a



new milling technology called Shingin milling. Satake EDB series milling machines utilising this technology are now able to mill sake rice in the most efficient manner.

Whilst keeping the operating times of conventional methods, Shingin milling mills around the starch, removing unnecessary components while leaving the starch in its original shape. Sake rice milled to 60% milling degree with Shingin milling has the same low protein profile as 40% milling degree rice milled spherically with conventional machinery, improving yield by 20%.

In other words, although there are several factors which affect the taste of the final product (like water quality, yeast, and the taste of the rice), sake brewed with Shingin milling can achieve premium taste with less waste.

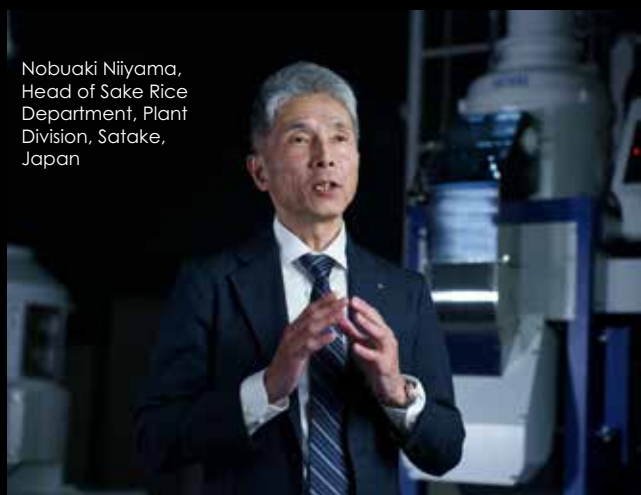
An additional benefit is that sake made with lower protein content rice is more likely to maintain its quality over time, making it more suitable for export. With its various advantages and superior milling ability, Shingin milling is expected to add additional value to the craft of traditional sake brewing.

Shingin milling is still a new technology, and its true value will become apparent as sake breweries all over Japan brew sake using Shingin milled rice.

Soon, the world will enjoy sake made with our new technology. I hope you look forward to it like I do.

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