BEGINNER SAKE

Material contained in this document applies to multiple course levels. Reference your syllabus to determine specific areas of study.

Content contributed by Anne Drummond & Jenny Parker, Imperial Beverage

We all have favorites. A rich, luscious, buttery Chardonnay on a hot, hot summer day, served outdoors under an ancient shade tree. A stinky, spicy, tongue drying Cabernet served with our favorite carnivorous treat. But Sake?

In the aftermath of the earthquake and tsunami in March 2011, not to mention a crisis of nuclear proportion, Japan's Sake industry has taken a blow. With power outages rampant and little promise of revival imminent, many breweries are fearing the worst. Wine & Spirits (June, 2011) reports that from Tokyo to the west, however, breweries are operational, and exports will not cease to exist. (Kudos to W&S for ending the article thus: "…it might be a good time to familiarize yourself with a map of Japan.")

ABOUT SAKE

Just as grape varietals impact the development of a wine, excellent Sake requires the finest rices. This grain contains a high starch content in its core, allowing the integrity of the rice to remain as long as possible through the brewing process. Called "Shinpaku-mai" in Japanese, the flavor profile of Sake depends on achieving balance between sweet and acid. This balance is trusted to skilled artisans that have understanding of climate, rice, water, technology, and the subtleties required in the touch of a brewing batch.

WHAT TO LOOK FOR IN A SAKE

FRAGRANCE

Whether a rich, rice scent, without distracting floral essence, or a perfumy sampling, fragrance is the first stop on the tasting spectrum, providing insight into the contents of your glass.

IMPACT

Is the Sake quiet on the palate, or explosive in the mouth? How does the liquid "behave" on the tongue? Just as an acidic Sauvignon Blanc makes the mouth water, and a Tannat might cause you to pucker from the dry experience, so will each Sake have a behavior worth noting.

"In the aftermath of the earthquake and tsunami in March 2011, not to mention a crisis of nuclear proportion, Japan's Sake industry has taken a blow. With power outages rampant and little promise of revival imminent, many breweries are fearing the worst. Wine & Spirits (June, 2011) reports that from Tokyo to the west, however, breweries are operational, and exports will not cease to exist. (Kudos to W&S for ending the article thus: "…it might be a good time to familiarize yourself with a map of Japan.")"

SWEET OR DRY

Dimension of sweetness is often the most perceptible, yet most difficult to convey. The gravity of a Sake, which references the density of the Sake to the density of water, offers some suggestion to the viscosity and the sweetness. Regardless, the taster walks the subjective line of sweet to dry when tasting.

ACIDITY

Refreshingly simple, acidity is expressed on the tongue in Sake just as it would in high citric foods, offering a cutting through the oily measures of paired fishes, sauces or cheese.

PRESENCE

The wine analog here would be body, or the mouth feel and richness of the Sake. Light and delicate to rich and viscous; how does the Sake feel on the mouth? Does it have some weight, or is it light and airy? Great sakes are made that fit both descriptions.

EARTHINESS

A odd descriptor, perhaps, but many Sakes will provide a note of rusticity, with notes of mushroom or wet earth. This will add to the complexity or depth of the Sake, and is more common in Sake from the southern kurus. Aged Sake will also often feature this flavor note.

TAIL

The finish, the length, the persistence of the Sake. How long does it hang around? A well made Sake can have a surprisingly long tail, with a variety of changing flavors as it goes. Depending on mood or food, you may opt for something clean and bright, with a very short, brisk tail, or a Sake with something to savor after the last swallow.

“Just as an acidic Sauvignon Blanc makes the mouth water, and a Tannat might cause you to pucker from the dry experience, so will each Sake have a behavior worth noting.

The wine analog here would be body, or the mouth feel and richness of the Sake. Light and delicate to rich and viscous; how does the Sake feel on the mouth? Does it have some weight, or is it light and airy? Great sakes are made that fit both descriptions.

Sake can have a surprisingly long tail, with a variety of changing flavors as it goes.”

HOW SAKE IS MADE

Sake is usually referred to in English-speaking countries as rice wine; however, this term is a misnomer. Unlike wine, in which alcohol is produced by fermenting sugar that is naturally present in grapes, sake is produced by means of a brewing process more like that of beer. Thus, sake is technically "rice beer" rather than "rice wine".

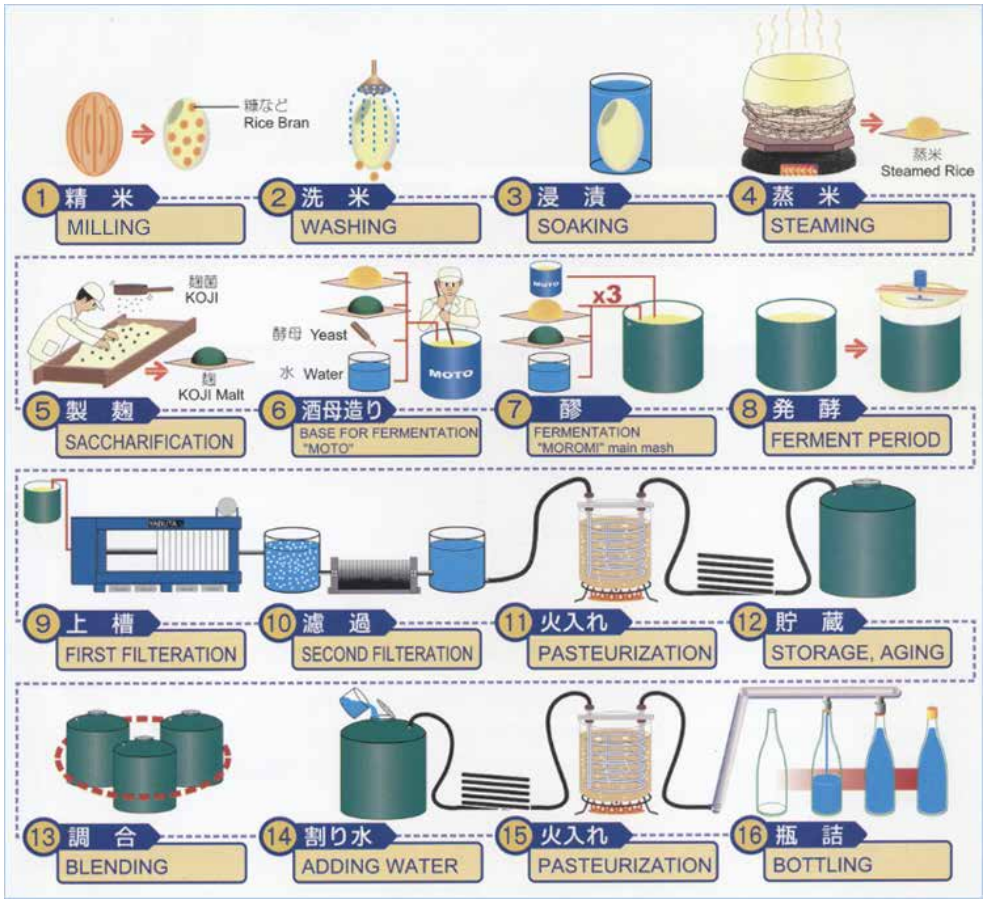
To make beer or sake, the sugar needed to produce alcohol must first be converted from starch.

The brewing process for sake differs from the process for beer, in that for beer, the conversion from starch to sugar and from sugar to alcohol occurs in two distinct steps. But when sake is brewed, these conversions occur simultaneously. Furthermore, the alcohol content differs between sake, wine, and beer. Wine generally contains 9%–16% ABV,[1] while most beer contains 3%–9%, and undiluted sake contains

18%–20% (although this is often lowered to about 15% by diluting it with water prior to bottling). There are two basic types of sake: Futsū-shu (ordinary sake) and Tokutei meishō-shu (special-designation sake). Futsū-shu is the equivalent of table wine and accounts for the majority of sake produced. Tokutei meishō-shu refers to premium sakes distinguished by the degree to which the rice has been polished and the added percentage of brewer's alcohol or the absence of such additives.

PRODUCTION

The rice used for brewing sake is called shuzō kōtekimai (sake rice). The grain is larger, stronger, and contains less protein and lipid than the ordinary rice eaten by the Japanese. The rice has a starch component called shinpaku in the center of the grains. Since sake made from rice containing only starch has a superior taste, the rice is polished to remove the bran. If a grain is small or weak, it will break in the process of polishing. This rice is used only for making sake, because it is unpalatable for eating. There are at least 80 types of sake rice in Japan. Among these, Yamadanishiki, Gohyakumangoku, Miyamanishiki and Omachi rice are very popular.



> **To make beer or sake, the sugar needed to produce alcohol must first be converted from starch.**

WATER

Water is one of the important ingredients for making sake. Rigid restrictions are observed for the concentrations of certain chemical substances that can affect the taste and quality of sake. The water used is almost always groundwater or well water. Urban breweries usually import water from other areas, because of the difficulty of getting water of sufficient quality locally.

BREWING

MOROMI, THE MAIN MASH

Sake is produced by the multiple parallel fermentation of rice. The rice is first polished to remove the protein and oils from the exterior of the rice grains, leaving behind starch. Thorough milling leads to fewer congeners and generally a more desirable product.

Newly polished rice is allowed to "rest" until it has absorbed enough moisture from the air so that it will not crack when immersed in water. After this resting period, the rice is washed clean of the rice powder produced during milling and then steeped in water. The length of time depends on the degree to which the rice was polished, ranging from several hours or even overnight for an ordinary milling to just minutes for highly polished rice.

After soaking, the rice is steamed on a conveyor belt. The degree of cooking must be carefully controlled; overcooked rice will ferment too quickly for flavors to develop well and undercooked rice will only ferment on the outside. The steamed rice is then cooled and divided into portions for different uses.

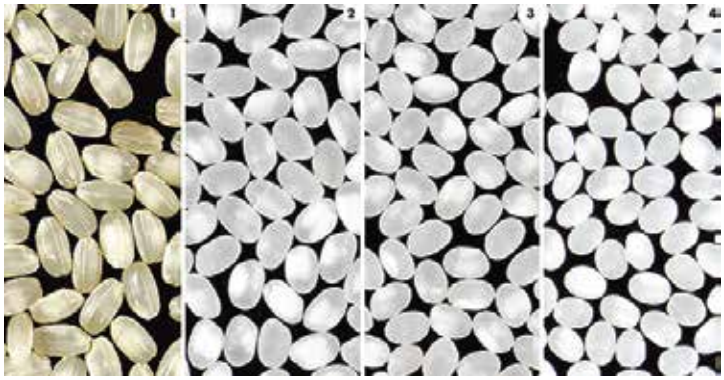
The microorganism Aspergillus oryzae is sprinkled onto the steamed rice and allowed to ferment for 5-7days (Uno et al., 2009). After this initial fermentation period, water and the yeast culture Saccharomyces cerevisiae are added to the koji (rice and mold mixture) and allowed to incubate at four degrees Celsius for about seven days (Uno et al., 2009). Over the next four days, pre-incubated mixture of steamed rice (90 kg), fermentated rice (90 kg) and water (440L) are added to the fermented mixture in three series (Uno et al., 2009).

This staggered approach allows time for the yeast to keep up with the increased volume. The mixture is now known as the main mash, or moromi.

The main mash then ferments, at approximately 15-20 degrees Celsius for 2–3 weeks. With high-grade sake, fermentation is deliberately slowed by lowering the temperature to 10°C (50°F) or less. Unlike malt for beer, rice for sake does not contain the amylase necessary for converting starch to sugar and so it must undergo a process of multiple fermentation. The addition of A. oryzae provides the necessary amylases, glucoamylases, and proteases to hydrolyze the nutrients of the rice to support the growth of the yeast (S.cerevisiae) (Uno et al., 2009). In sake production these two processes take place at the same time rather than in separate steps, so sake is said to be made by multiple parallel fermentation.

After fermentation, sake is extracted from the solid mixtures through a filtration process. For some types of sake, a small amount of distilled alcohol, called brewer's alcohol, is added before pressing in order to extract flavors and aromas that would otherwise remain behind in the solids. In cheap sake, a large amount of brewer’s alcohol might be added to increase the volume of sake produced. Next, the remaining lees (a fine sediment) are removed, and the sake is carbon filtered and pasteurized. The sake is allowed to rest and mature and then usually diluted with water to lower the alcohol content from around 20% to 15% or so, before finally being bottled.

> **“The grain is larger, stronger, and contains less protein and lipid than the ordinary rice eaten by the Japanese.”**



MATURING

The process during which the sake grows into a quality product during storage is called maturing.

Mature sake has reached its ideal point of growth. New sake is not liked because of its rough taste, whereas mature sake is mild, smooth and rich. However, if it is too mature, it also develops a rough taste. Nine to twelve months are required for sake to mature.

Aging is caused by physical and chemical factors such as oxygen supply, the broad application of external heat, nitrogen oxides, aldehydes and amino acids, among other unknown factors. It is said that Saussureae radix from the Japan cedar material of a barrel containing maturing sake comes to be valued, so the barrel is considered indispensable.

> **“The process during which the sake grows into a quality product during storage is called maturing.”**

TŌJI

Tōji is the job title of the sake brewer. It is a highly respected job in the Japanese society, with tōji being regarded like musicians or painters. The title of tōji was historically passed on from father to son; today new tōji are either veteran brewery workers or are trained at universities. While modern breweries with refrigeration and cooling tanks operate year-round, most old-fashioned sake breweries are seasonal, operating only in the cool winter months. During the summer and fall most tōji work elsewhere, and are commonly found on farms, only periodically returning to the brewery to supervise storage conditions or bottling operations.

In Japan sake is served chilled, at room temperature, or heated, depending on the preference of the drinker, the quality of the sake, and the season. Typically, hot sake is a winter drink, and high-grade sake is not drunk hot, because the flavors and aromas will be lost. This masking of flavor is the reason that low-quality and old sake is often served hot.
Sake is usually drunk from small cups called choko, and poured into the choko from ceramic flasks called tokkuri. Saucer-like cups called sakazuki are also used, most commonly at weddings and other ceremonial occasions. Recently, footed glasses made specifically for premium sake have also come into use.

“Tōji is the job title of the sake brewer. It is a highly respected job in the Japanese society, with tōji being regarded like musicians or painters.”

Another traditional cup is the masu, a box usually made of hinoki or sugi, which was originally used for measuring rice. In some Japanese restaurants, as a show of generosity, the server may put a glass inside the masu or put the masu on a saucer and pour until sake overflows and fills both containers.

Aside from being served straight, sake can be used as a mixer for cocktails, such as tamagozake, saketinis, nogasake, or the sake bomb.

TYPES OF SAKE

HONJOZO

These are Sakes to which a small amount of distilled alcohol has been added. This is the most common type of Sake, but don’t be fooled into thinking that Honjozos are all of lower quality. While it’s true that most poor Sakes are made this way, the simple addition of alcohol can often bring out wonderful aromas and flavors. Some of the worst Sakes are Honjozos, but so are some of the very best values. Generally lighter, and frequently very fragrant.

JUNMAI

These are pure Sakes, nothing but rice, water, yeast, and the Koji mold that makes everything possible. Generally heavier and with more mouth weight than Honjozo, any Ginjo and Daiginjo Sakes are Junmai.

GINJO

Ginjo Sakes are sakes that use rice with at least 40% of the kernel ground away before the brewing process begins. This removes much of the starchy outer shell, which adds little to the clarity and brightness of the Sake and can interfere with the purity of the finished product. Obviousy this is very costly, is done in a very limited number of Sakes, and currently represents about 6% of all Sakes in the market.

> **JUNMAI - These are pure Sakes, nothing but rice, water, yeast, and the Koji mold that makes everything possible. Generally heavier and with more mouth weight than Honjozo, any Ginjo and Daiginjo Sakes are Junmai.**

DAIGINJO

This level goes even further, with at least a full half of the rice kernel ground away. Very few Sakes carry this designation, and they are worth seeking out. Ginjo and Daiginjo Sakes are the apex of Sake making. These are generally light, delicate and beautiful, with intricate flavors and great balance.