



A SAKE PRIMER

by John Freedman © 2024

QUINTESSENTIALLY JAPANESE

There is perhaps nothing more Japanese than sake. Closely associated with the sanctity and purity of rice, sake has been brewed throughout the Japanese archipelago for almost two millennia. The exact origins of sake are uncertain. Most historians believe that the first fermented rice beverages were brewed in China, perhaps as long as 4000 years ago. Sake and knowledge of the sake-making process were most likely brought to Japan by Korean traders in about the 3rd century AD. The art of sake-making was thoroughly embraced and highly refined by the Japanese, so much so that the Japanese long ago made it their own. In the 8th-century capital of Nara, the craft of sake-making rose to such importance that it became the exclusive province of the Imperial Court. Today there are over 10,000 brands of commercial sake brewed in Japan and hundreds more around the globe.

Sake is revered for its delicate flavor, its purity and simplicity, its associations with nature, and its ties with ceremony - all highly consonant with the Japanese aesthetic. It is inextricably bound with Shinto rituals and is a participant in every major rite-of-passage and celebration in Japanese life. Sake is offered at the family altar to placate the gods and for the delectation of the spirits of the deceased. The bride and groom in Shinto ritual seal their marriage by exchanging sake cups and drinking out of each other's cup. Sake is part of Shinto funeral rites and offered to roadside Buddhas to bring good fortune. It features prominently in every holiday festival and no family occasion or important business meal would be complete without it. Friendship is cemented by the mutual pouring and sharing of sake. Sake is and always has been a major part of Japanese life.

THE SAKE-MAKING PROCESS

Often called "rice wine" in the West and properly referred to as *nihonshu* in Japan, sake is actually not a wine at all. Rather than being *vinted* from *fruit*, sake is *brewed* from *grain* in a process that shares some similarities with the beer-making process but differs in that it involves a unique double fermentation process known as ***parallel fermentation*** in which there is simultaneous conversion of starch to sugar and sugar to alcohol.

Sake rice is a special short-grain pearl rice known in Japan as *sakamai*. It is larger, rounder, and – most importantly- has a much higher starch content than table rice. Sake rice has a plump central starch packet called the ***shinpaku***, or "white heart." It is considerably more difficult to grow and thus more expensive than other varieties of rice. Demand always exceeds supply. There are over 70 varieties of sake rice. Some are renowned, such as the Yamada Nishiki strain (the "King of Sakamai") grown in Hiroshima and Okoyama prefectures. Like wine grapes, each variety of rice has different qualities and grows best in different regions under specific soil and climactic conditions – the concept of *terroir* is as important in the sake world as it is in the wine world. Thus the type and quality of the rice used to make a given sake, and the conditions under which it is grown, are key determinants of the flavor and quality of the final product.

The water used during the brewing process also plays a major role. Mineral content affects the speed of the enzymatic reactions of fermentation, and minerals also directly affect the flavor and color of the final product. In general, more mellow, rounded sakes are made from softer water, while drier, crisper sakes are made with harder, mineral-rich water. Iron and manganese are detrimental minerals in that they react with amino acids to

create off-flavors and dull the color of sake. Potassium, magnesium, and phosphoric acid positively affect the fermentation process by aiding the propagation of yeast.

Sake may be made from well water, river water, spring water, or lake water. The water may be used in its 100% natural state or it may have minerals added by the **toji** (head sake-maker) to achieve desired qualities in the sake. Some purists insist on unadulterated water straight from the natural source. Sake aficionados may argue endlessly over which water makes the finest sake, but all agree that the water used in the sake-brewing process, due to its mineral composition, unquestionably shapes the final flavor and character of the finished sake. The role of water is so important that many sake breweries take their name from the water source used, be it a river, lake, or mountain stream.

While every step of the sake-making process is important, perhaps the most critical part is the milling or polishing of the rice. The more polished the rice, the softer and more elegant the sake. The finest sakes have over 50% of the outer portion of the rice kernel polished away. The outer portion, or cortex, of the rice kernel contains fiber, fat, and amino acids. It is the starchy core that is the substrate for the enzymes which produce sugar and then alcohol in the sake-making process. The purer the starch, the finer the sake. Traditional stone milling of sake rice has been supplanted by high-tech polishing machines which remove the outer layer of the kernels slowly, evenly, and gently, so as to prevent any heat generation or breakage. The percentage of the rice remaining after the polishing process, known as the **seimai-buai** (pronounced "say-my-boo-eye") is the single most important quantitative determination of sake quality. *Seimai* means polishing. The lower the number (less grain remaining after polishing), the finer the sake. White table rice has a **seimai-buai** of 91 (9% polished away). The very best sakes have a **seimai-buai** of only 35 (65% of the outer kernel polished away). In addition to providing a more concentrated starch substrate for the fermentation process, some sake experts believe that the protein and fat components of the outer kernel are associated with a hangover effect, and thus finer sakes made from more highly polished rice are less likely to cause a hangover. The fine powder that is formed in the polishing process, called **nuka**, is used to make cakes, livestock feed, and other products – nothing is wasted.

Sake rice is first steamed and then cooled, and then yeast is added to form a starter mash known as **moto**. The **moto** is then combined with a special mixture of rice and *Aspergillus* mold, known as **koji**. *Koji* is made by mixing greenish-yellow *Aspergillus oryzae* spores with a small amount of steamed rice and letting the mixture sit for about 48 hours in a warm, humid environment to allow propagation of the mold. The *koji* plays a key role in the crucial process of converting the rice starch into sugar (saccharification). In beer-making, the first step is "malting" the barley in a natural saccharification process that occurs in the intact grain and does not require added enzymes. Because the husk is removed from sake rice, the saccharification enzymes must be added in and are provided by the *Aspergillus* mold. If you think the use of mold for saccharification sounds unappealing, compare it to the original process of **kuchi-kame** : saccharification was achieved by the enzymes in human saliva (obtained by communal spitting into a large vat of rice!). Additional rice and water are added to the **moto** over several days to form the main mash, known as **moromi**. The yeast ferments the sugars produced by the saccharification process, yielding alcohol. This double simultaneous fermentation, starch-to-sugar by the *Aspergillus* mold and sugar-to-alcohol by the yeast, is unique to sake. The **moromi** ferments for about 20-30 days, producing a large foam "head" up to 3 or 4 feet high. The liquid is then pressed off through cotton or hemp bags and pasteurized at 150 degrees F (sake was being pasteurized in Japan about 300 years before the birth of Pasteur). The sake is then filtered, removing all particulate matter and clarifying it (unfiltered sake has a slight greenish-yellow cast) and is then placed in brewing tanks to mature for about 30 days. The total process described thus far takes about 60 days. Most sake is then aged for about 6 months before bottling and release. Aging reduces the sugar content and increases the alcohol content slightly as the last remnants of sugar are

fermented. The final alcohol content of most sakes is 15-17%, compared to about 10-14% for most wines. A special type of sake with an alcohol content of 20% is known as **genshu** and is usually drunk “on the rocks.” Most sake is dry, with very little residual sugar. Sake’s sweetness or dryness is measured on a scale of -12 to +12 known in Japanese as the **nihonshudo** and in English as the **Sake Meter Value, or SMV**. It is inversely related to specific gravity, so that -12 is extremely sweet (**amakuchi**) and +12 is bone dry (**karakuchi**). Consider +3 about neutral, or medium-dry. Anything lower than +3 will taste slightly sweet. An SMV of +6 to +7 is characteristic of a very dry sake which still maintains balance and full flavor. As with wine, acidity affects perception of dryness, so that with the same SMV reading, a sake with a higher acidity will taste drier.

Sake is best drunk fresh, within a year of bottling. Once opened it should be refrigerated and drunk as soon as possible. There are no vintages in the sake world. It’s all about freshness. Smaller brewers release their sakes every year on October 1. The sake is in its peak condition at the time of release. Unopened sake is best stored in the refrigerator or in a comparably cool, dry place. Unpasteurized sake, known as **namazake** (see below) is particularly important to drink fresh and keep refrigerated.

While the above process may sound straightforward, it is anything but. At each sake brewery, or **kura**, there are innumerable details and nuanced variations in the process that are left to the **toji** to personalize. The skill of the **toji** and his (or very rarely in Japan, her) brewers is every bit as important as the quality and **semmai-buai** of the rice and the chemical composition of the water.

TYPES OF SAKE

Sake is classified primarily by its **semmai-buai**, with a few adjustments for variations in processing. The most common form of sake is called **futsuu-shu**. This could be considered table sake and this category currently comprises about 75% of the entire sake market. Until recently it accounted for even more. The **semmai-buai** of this ordinary sake is greater than 70, meaning less than 30% of the rice is polished away. Alcohol is added during the brewing process, and the amount of alcohol added is not limited by law. This allows the sake to be brewed more rapidly and with significantly less rice. An ultra-economical brewing method was developed in Manchuria in the harsh war years and involves adding sugars as additional substrate for the yeast to turn into alcohol. Sake made in this fashion is called **sanzo-shu** or “triple sake” because the yield is three times greater for a given amount of sake rice. Sanzo-shu is the lowest grade of sake and is best avoided. Futsuu-shu and sanzo-shu are usually drunk warm, which is characteristic of more ordinary sakes. Heating mellows the coarser flavors of lesser quality sakes. While it is fine to drink futsuu-shu as a “house sake” in a Japanese restaurant as you would a house wine in a modest restaurant, life is too short to drink only futsuu-shu.

This brings us to the heart of the matter: **Premium sakes**, also known as **Special Designation** sakes. These finer sakes come in many varieties and open a world of possibilities to the sake enthusiast. They can generally be categorized as follows:

Honjozo-shu is made from rice with a **semmai-buai** of 70 or less, meaning at least 30% of the rice is polished away. It contains some added alcohol but unlike futsuu-shu the added alcohol is strictly limited to only small amounts by law and no added sugars are permitted. When alcohol is added in the brewing process it is usually added just before pressing. Honjozo-shu is light and very fragrant. It is usually medium-dry. It is often drunk at room temperature, but some prefer it slightly warmed (around body temperature), or in the case of finer honjozos, slightly chilled.

Junmai-shu is made without any alcohol added during the brewing process. It is usually made from rice with a **semmai-buai** of 70% or less, but as of 2005 this is no longer required by law. Current law does require that the

seimai-buai be listed on the label. Because no alcohol is added, junmai-shu is often referred to as “pure sake” and some purists believe it is the only “real” sake. Junmai-shu sake may have a softer character than honjozo-shu and is often drier, with a higher acid content. It is usually drunk cool or cold. Note that while there are many junmai-shu purists, adding alcohol during the sake-making process does not necessarily make a sake lower grade. It is one manner of brewing and some argue it produces a more robust sake with a longer shelf life. There are those in the sake world who believe that adding alcohol yields a more refined sake, as some of the heavier flavor components are diluted. Others believe that added alcohol helps “pull” some extra, more subtle flavors out of the moromi. An undeniable quality of honjozo-shu is that the addition of alcohol increases volatility and thus alcohol-added sakes have a richer “nose” than junmai sakes. Junmai sakes in general do not keep as long as alcohol-added honjozo sakes. The bottom line is that both honjozo-shu and junmai-shu sakes have their advocates and both have positive qualities that may be exploited by a skilled toji and appreciated by sake-lovers. Interestingly, virtually all sake made in the USA or imported into the USA is junmai-shu, because quirky U.S. alcoholic beverage tax law puts fermented beverages with no added alcohol in a much lower tax category than those with added alcohol. Thus junmai-shu is heavily tax-favored and both the seller and consumer benefit price-wise.

Ginjo-shu is the next step up in the sake hierarchy. It is made from rice with a *seimai-buai* of **60** or less, meaning at least 40% of the rice is polished away. It also contains a little bit of added alcohol. It is quite dry and delicate but very fragrant and complex with subtle fruity or floral overtones. Junmai-shu sake with a *seimai-buai* of 60 or less is **Junmai Ginjo** and is among the most elegant of sakes. Ginjo sakes are best appreciated cold.

Daiginjo-shu (*dai* means great) is the top of the sake pyramid. It is often referred to as “super premium sake” and is the pinnacle of the craft, with a *seimai-buai* of **50** or less – at least half of the rice kernel is polished away before brewing. The finest daiginjos have a *seimai-buai* as low as 35. Daiginjo also contains a small amount of added alcohol. It is extremely smooth and silky, and even more delicate and fragrant than ginjo-shu due to the highly concentrated starch substrate of its very highly polished rice. The ultimate sake for some is **Junmai Daiginjo**, pure sake with no alcohol added, made from very highly polished rice with a *seimai-buai* of 50 or less. All daiginjo-sakes should be drunk cold. If you want the finest and are willing to pay the price, daiginjo is the way to go.

Namazake is unpasteurized sake and incorporates all of the above types. **Nama** means “raw.” Skipping pasteurization gives a fresh and lively character to the sake’s flavor. Namazake can be considered “draught sake.” It is sometimes referred to as “live sake” because the yeast has not been fully inactivated. It has a short shelf life and should be refrigerated at all times and drunk shortly after opening. It is always served cold and is considered a summer drink.

Nigorizake is sake that is unfiltered or filtered through a very coarse filter, leaving some of the lees. **Nigori** means “cloudy,” and nigorizake is a bright milky white. Nigorizake is on the sweeter side and is more rustic than filtered sake. The best nigorizakes are bold, rich, and robust with just a touch of sweetness. A type of sake that is more finely filtered than nigorizake but leaves some of the finer lees is called **ori-zake**. *Ori* is the Japanese word for lees. Ori-zake usually looks quite clear but has a fine line of white sediment on the bottom of the bottle which distributes when shaken.

Jizake is sake of any designation which has been made in a small local sake brewery, usually in a rural area. It is analogous to the “microbrews” of the beer world. Jizake is typically served in the ubiquitous Japanese pub restaurants known as **izakaya**. Yet a step beyond jizake is **doboroku**, true homebrew sake. Doboroku is of

course very irregular in quality, and in any event it is now technically illegal in Japan (allegedly because of health concerns, but more likely because of tax revenues that would be lost).

Rarely, sake will be aged slowly over years in a carefully controlled cool environment. Aged sake is called **koshu**. Sake that has been aged in cedar barrels is called **taruzake**. It has a characteristic flavor imparted by the wood that can be overpowering to some and alluring to others. Aged sakes occupy a very small niche in the sake world, as their more pungent flavors and darker color are generally not appreciated by the Japanese who revere freshness and simplicity, and lack the Western tradition of more intense, matured beverages.

In addition to the type and style of sake, many other factors come into play as discussed earlier- the type and quality of the rice, the water used, countless variations in the brewing process, and the brewer's skill. There is much overlap in the flavor profiles of all the different types of sakes, and different types of sake can share similar characteristics. You should not place sole emphasis on the sake categories and by all means do not restrict yourself to any one type of sake.

SAKE REGIONS

Sake is as diverse as wine. Just as in the wine world, the region where a sake is brewed plays a major role in determining its final character. The *sakamai* (sake rice) used may be locally grown and the water used is almost always from a traditional local source which in many cases may have been used in brewing sake for more than a thousand years. Climate not only affects the growing of rice but also affects the sake-making process itself. The fermentation process is very much affected by temperature, humidity, and even the amount of daylight. Since the Japanese archipelago extends over 1000 miles north to south, climactic variations are considerable. Beyond the ingredients used and the climactic conditions affecting the brewing process, regional variations and brewing traditions also play a tremendous role in the techniques used by the *toji* to create a desired character in the sake. The result of all of the above is that different regions produce different and often very characteristic styles of sake. For example, the sake produced around Kobe in the southwestern region of the main island of Honshu is renowned for being very dry but full-bodied- a perfect accompaniment to the region's famous Kobe beef. Regional designations can be somewhat confusing and on occasion contentious, but nowhere near so much as in the wine world. Technically, Japan is divided into 9 regions. Regions are analogous to geographic regions in the U.S. such as the Northeast, Midwest, etc. Each region comprises several prefectures; prefectures are roughly analogous to states in the U.S., and there are 47 of them. As in the wine world, there may be general regional patterns in style with sub-variations by prefecture and further variation in local *terroir* and individual brewery styles. Some sake "regions" are named after a famous city in the area, such as Kobe. In general it is geographically accurate and usually least confusing to group sake by prefecture or by proximity to a known city. While you should not let regional origin complicate your choice of sake too much, there may be certain regional styles that you find you consistently like. This can help guide your choice when presented with a diverse selection of sakes, as is increasingly the case at finer Japanese restaurants. For example, I personally enjoy the dry, crisp, subtly aromatic sakes of the mountainous region in north central Honshu, including those from **Gifu prefecture** around Takayama, neighboring **Nagano prefecture** just a bit to the east, and **Niigata prefecture** which is contiguous with Nagano but also faces the Sea of Japan and thus has a slightly different climate and soil from its neighbors (see PREFECTURE MAP OF JAPAN, page 8). Niigata is a premier rice-growing area and in fact has the highest rice output of any prefecture. The sakes of Niigata tend to be exceptionally clean and refined, very dry, but a bit lighter than those of neighboring Gifu prefecture. I have never gone wrong buying or ordering a ginjo or dai-ginjo sake from this geographic region, as the quality and style suit my taste.

As a final note on sake regions it should be pointed out that sake is also brewed in the USA, Australia, China, Brazil, and Vietnam. Northern California is viewed by many as a premier sake-making region on par with the best of Japan. Sakamai rice is locally grown in the Sacramento Valley and much lower agricultural labor costs than in Japan give U.S. sake-makers a decisive competitive edge in the production of fine sake at a reasonable cost. Moderate climate with cooling ocean breezes and pure water from the nearby Sierras provide additional advantages. In addition to quality, Northern California is renowned for its quantity of sake production- since 2005 it has produced more sake than any single region of Japan. Takara in Berkeley (makers of the well-known Sho-Chiku-Bai brand) and Ozeki in Hollister, CA are among the leading Northern California brands.

THE SAKE SHOP

Traditional sake shops in Japan are called **saka-ya**. Saka-ya are often associated with a *kura* (sake brewery) and may specialize in *jizake*, or local “microbrew” sakes, but large retailers which carry hundreds of brands are also called saka-ya. Saka-ya, like kura, can be identified by a very characteristic globe of dried Japanese cedar needles hanging in the entryway. This is called a **sugi-dama**. In former times the *sugi-dama* was hung when the needles were green and they slowly turned brown over several months. It was thought that when the sugi-dama turned brown, the sake was ready for drinking.

SAKE CUSTOMS

Like wine drinking, sake drinking can be a straightforward affair or an elaborate ritual. For most Japanese, sake drinking is a straightforward affair. However, there are some important traditions and customs that all respect:

- 1) Never fill your own sake cup – allow your host or companion to do so.
- 2) Always lift your cup, using two hands, to the person pouring.
- 3) Cups should be filled in order of priority, usually age, from oldest to youngest.
- 4) Always toast the server either with a “Kampai!” (loosely translated as “Cheers!” but literally meaning “dry glass”) or “Banzai!” (Live 10,000 years!).

Sake is usually poured into cups from a small pitcher known as a **tokkuri**. Some prefer a more traditional way of drinking sake directly out of small pine or cedar boxes called **masu**. A masu holds about 180 ml (6 ounces) of sake. In years past, **masu** were used as the unit measurement for rice, which was the common currency. Note that the volume of one masu, 180 ml, is known as a **go**. Ten **go** equal 1800 ml or one **sho**- a standard size for a large bottle of sake. A smaller standard sake bottle is 720 ml, or 4 **go**. The unit used to measure production capacity of a brewery is called a **koku**, equal to 1,000 **go** or 180 liters, which is 47.5 gallons. Large breweries produce thousands of **koku**, smaller local breweries just a few.

Sake-tasting, like wine-tasting, can be quite formal and ritualistic. The appearance of the sake is viewed in a special “snake-eye” sake cup with concentric circles painted on the inside bottom. Perfect clarity is a highly prized characteristic of filtered sake. The bouquet or aroma is described using one of 90 or so official descriptive words. The sake is then tasted and to achieve the best sensation the sake experts “push the sake into the nose” by sucking in air and slowly breathing out through the nose. The sake is swallowed and its **nodokoshi** (“how it passes through the throat”) is described. Finally, the taste of the sake is described. Countless adjectives and descriptive phrases may be used, as in wine-tasting. These may vary from helpful to absurd. Some examples from The Insider’s Guide to Sake by Philip Harper: “A peppery touch of spice and chocolatey notes...” “Floral rather than fruity, though with a touch of pear and perhaps melon. Soft-feeling with a transparency of flavor to match its clarity.” “Pale echoes of grass and stone with a slightly smoky touch of sweet apple.”

“Lovely ginjo bouquet, pear with a hint of strawberry. Outstanding clarity and depth of flavor, with never a discordant note to upset the harmony of balance. Refined but not precious.” “A flattering mellow dimension, with a touch of conciliatory sweetness at the finish.” In reading such descriptions I am reminded of Herb Caen’s famous quip after hearing a lavish sensual description of a fine cabernet at a Napa Valley wine competition: “I didn’t know whether to drink it or make love to it.” Of more value than elaborate descriptions or even technical knowledge are these words of sake connoisseur John Gauntner in The Sake Handbook:

**“In the end, the flavor and fragrance of the sake– and whether it appeals to you –
is all you really need to know.”**

Matching sake with food, like matching wine with food, is an imprecise, subjective process. Sake most traditionally accompanies fish, and some feel that sake should not accompany rice since it is made from rice, and thus sake and rice together are a “yin-yin” combination rather than the preferred yin-yang. But there are no hard and fast rules. Indeed, the subtle and versatile nature of sake goes well with many foods and flavors. Sake is much less acidic than wine and is therefore considered by some to be a more subtle and complementary accompaniment to many foods. Today, more and more restaurants in the U.S. are experimenting with sake. This venerable Japanese brew has made it onto some of the most notable wine lists in America. The trend in many finer restaurants toward multiple small, refined courses is very similar to the Japanese culinary approach, and sake is well-suited to such a style of eating.

There is a trend both in Japan and abroad toward producing and consuming finer, handcrafted sakes. Sake consumption in the U.S. has increased between 8 and 15 percent per year for the past 10 years, with the greatest increases in the last few years. Of the 10,000 sakes produced worldwide, about 250 are now available in the U.S. It is mostly the finer sakes which make it to the U.S. from Japan. Fortunately, even the very finest sakes rarely sell for more than \$50-\$75 per bottle in retail stores, far less than premium wines. It has been estimated that at the current time Americans drink about 160 glasses of wine for every cup of sake they drink. However, with current trends and the tendency of things Japanese to take root in the U.S., we Americans may soon be enjoying much more sake.

PRINCIPAL SOURCES AND RECOMMENDED READING:

The Sake Handbook by John Gauntner

The Insider’s Guide to Sake by Philip Harper

Sake: Water From Heaven by Roki Aioki

Tastes of Japan by Donald Richie

Sake Pure and Simple by Griff Frost and John Gauntner

Sake Expert Website: www.sakeexpert.com

How To Read a Sake Label: <http://www.sake-talk.com/read-sake-label/>

Film: *The Birth of Sake* (award-winning documentary by Eric Shirai- available on Netflix)

MAP OF PREFECTURES OF JAPAN

