

Savory, a.k.a. Umami

Savory tastes, sometimes called *umami*, generate lip-smacking sensations that are the hallmark of rich foods. Pizza, meats, and hard aged cheeses like Parmesan tend to be high in savory-tasting compounds, as are good broths, mushrooms, and tomatoes. While savory tastes are less discussed in Western cuisine than the four tastes described so far, they are foundational to Japanese cuisine. Savory taste receptors were only recently discovered; in 2002, researchers found a mechanism for these that has similarities to how sweet receptors work, ending any arguments that savory/umami is not a true taste.

The Japanese emphasis on savory tastes is a fascinating quirk of geography, climate, and the resulting edible plants. Japanese cuisine is the only one to make consistent, extensive use of

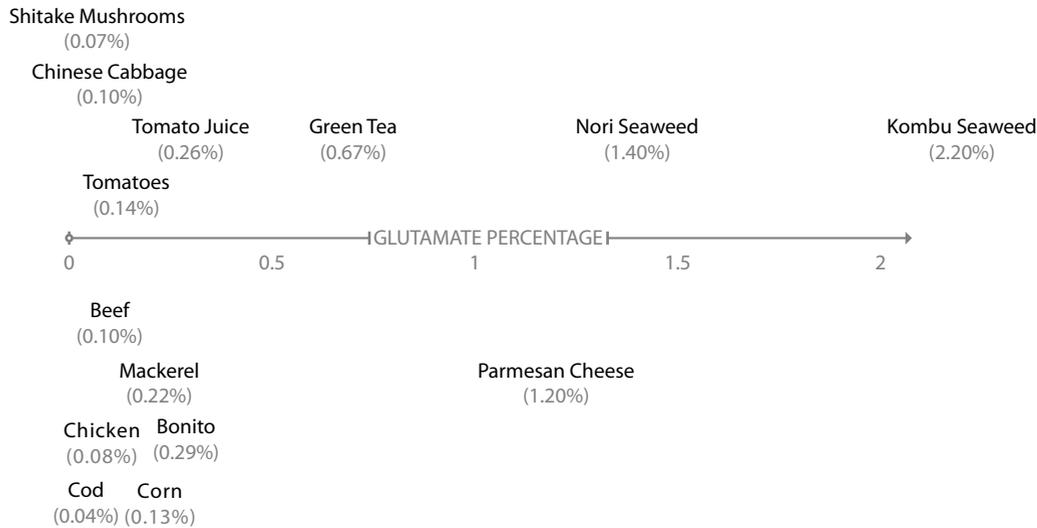
Unable to conjure a memory of a savory taste? Make a simple broth by rehydrating a tablespoon of dried shiitake mushrooms in 1 cup (240 mL) of boiling water. Let the mushrooms steep for 15 minutes. Taste the liquid; it will have a high level of glutamic acid from the mushrooms. (Alternatively, you can dissolve a small amount of MSG in a glass of water, but it'll also taste salty from the sodium.)

seaweed, and seaweed happens to be very high in the chemical compound glutamate. It's this compound, in the form of glutamic acid, that was first identified by a Japanese chemist, Kikunae Ikeda, in 1908. He initially used the Japanese word for delicious, *umai*, to describe how it increases the sensation of other tastes, suggesting *umami* and then "glutamic taste" as a name for the sensation. While others had described the taste sensation before—the French foodie Jean Anthelme Brillat-Savarin mused about it almost a century earlier when he wrote about *osmazome*—it was Ikeda who successfully isolated and commercialized it.

To an average Western palate, savory tastes are subtler than the four primary Western tastes. This isn't surprising, because only a few of the everyday ingredients used in Western cooking have tastants that trigger the savory sensation. Sauces like ketchup and fish sauce (used by the ancient Romans) are typical sources for savory flavors; adopted items like soy sauce are also common. (Modern ketchup is a taste miracle: sweet, salty, savory, and even a little sour, but not bitter—no wonder kids love it!)

From a biological perspective, savory receptors on the tongue sense nucleotides and amino acids such as glutamate. Glutamate—the same glutamate in monosodium glutamate (MSG)—is the most common compound that triggers savory taste. While Ikeda initially described the taste sensation as being glutamate-sensing, it's actually a broader phenomenon. Inosinate, guanylate, and aspartate are also naturally common in ingredients. Pragmatically speaking, though, the easiest way to add a savory taste is to use ingredients high in free glutamate. (Free glutamate can dissolve away from the food in order to bind with the receptors on your tongue; bound glutamate isn't easily detected.)

Why do we sense compounds like glutamate? Unlike with other tastes, we don't have a biological predisposition for savory sensations, although we do gravitate toward them. Presumably there was an evolutionary advantage to ensuring we ate protein-rich foods,



Free glutamate content of common ingredients.

as they provide necessary amino acids to build and repair muscle tissue. The very first thing many of us taste in life—human breast milk—is surprisingly high in glutamate. Just as sweetness and saltiness are associated with positive attributes of food (quick energy in the case of sweet and an element essential for regulating blood pressure in the case of saltiness), our craving for savory tastes ensures we ingest enough amino acids. Regardless, the savory taste is worth understanding for its hedonistic value.

There are plenty of natural sources of glutamate. The British and Australian fondness for vegemite is due to its savory kick. Many traditional Japanese dishes call for *dashi*, a stock made from ingredients high in natural glutamate, such as kombu seaweed (2.2% glutamate by weight). Making dashi is easy: in a pot, place 3 cups (720 mL) cold water and a 6" / 15 cm strip of kombu (dried kelp), and let the mixture rest for 10 minutes. Bring it to a boil slowly on low heat. Remove the kombu just before the water begins to boil and add 10g of bonito flakes (flakes of dried and smoked bonito fish). Bring the water to a boil, remove it from the heat, and strain out the bonito flakes. This liquid is dashi. To make miso soup, add miso paste, diced tofu, and (optionally) sliced green onions, nori, or *wakame* (an edible seaweed).

Glutamate occurs naturally in many other foods—for example, beef (0.1%) and cabbage (0.1%). And if you're like most geeks and pizza makes your mouth water, it might be because of the glutamate in the ingredients: Parmesan cheese (1.2%), tomatoes (0.14%), and mushrooms (0.07%). Besides using ingredients naturally high in glutamate compounds, you can add glutamate directly to food by using MSG. MSG is to savoriness as sugar is to sweetness: as a chemical, it's mostly odorless (still full of taste!), but it triggers the receptors on the tongue.

Increasing the sensation of savoriness has an ancillary benefit: it amplifies our other senses of taste. Savoriness increases the sensation of salty and sweet compounds, meaning that you can cut the amount of salt in a dish by adding savory-tasting ingredients or using MSG. (If using MSG, you should reduce salt regardless because it dissolves and disassociates into a sodium ion and glutamate, with the sodium ion increasing the salty taste.)

Sensitivity to monosodium glutamate, called *MSG symptom complex* by the medical community, has been found to temporarily affect around 1 to 2% of people. Intolerant individuals, given 3 grams of MSG without any other food, may experience short-term symptoms like headaches, numbness, or flushing about an hour later. Amounts of MSG added to foods don't generally exceed 0.5 grams, and double-blind controlled studies with placebos cast plenty of doubt on individuals who claim sensitivity.

-
- Tips**
- For vegetable dishes and vegetarian cooking, add ingredients high in glutamate to improve overall flavor.

-
- To make something more savory**
- Use savory ingredients such as corn, peas, tomatoes, Parmesan cheese, or soy sauce.
 - Use cooking techniques that increase savory compounds (e.g., curing and fermenting foods like bacon, soy sauce, and fish sauce increases their glutamate levels).
 - Add MSG, depending on how you feel about it. (The “Chinese restaurant syndrome” of MSG causing an allergic reaction is entirely placebo—no controlled study has ever replicated it—but placebo effects can be strong!)

-
- If a dish is too savory**
- No good counteraction; try dilution.
-

Edamame

Japanese for “beans on branches,” *edamame*—young soybeans that have been steamed and sometimes lightly salted—is a great savory appetizer before a meal. Popping the seeds out of the pods is an enjoyable slow start to dinner. Edamame are traditionally sold still on the vine (look for them that way in an Asian food market), but for most of us they're more easily found in the freezer section at well-stocked grocery stores.

To prepare them, either drop the **edamame** into **salted boiling water** and cook for 2–5 minutes, or steam them in a microwave, using a covered container with **¼ cup (~60 mL) water**, for 2–5 minutes. Sprinkle them with **salt** before serving. Try sautéing the shelled beans in **olive oil** with **crushed garlic and soy sauce**.