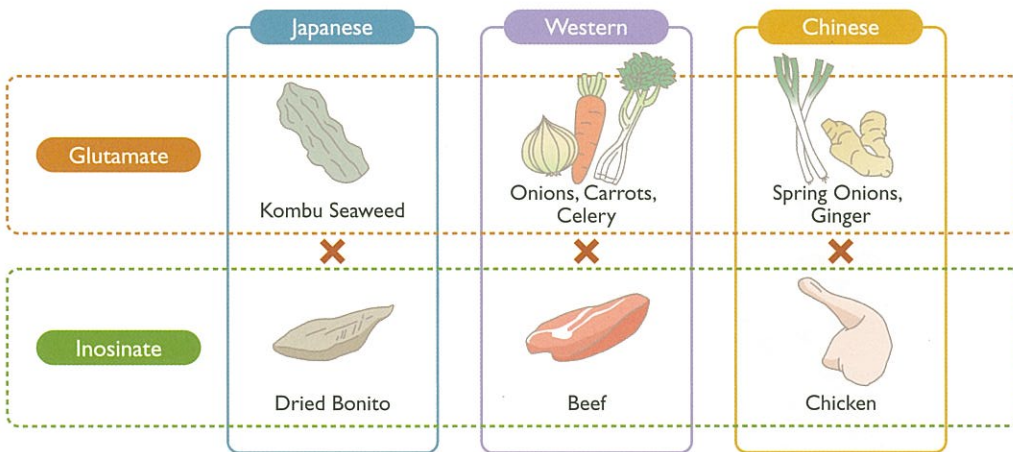


## 6. The Synergistic Effect of Combining the Various Umami Components Living a Life Full of Deliciousness

The umami taste is imparted not only by the amino acid glutamate, but also by nucleotides such as inosinate, which can be found in meat and fish, and guanylate, which can be found in vegetables such as dried shiitake mushrooms. When glutamate and the nucleotides inosinate and guanylate are combined, the umami taste of a dish is significantly magnified — about eight times more than when with glutamate alone — and there is a synergistic effect. Many cuisines, including Japanese, Western and Chinese capitalize on this.

The quintessential example of this phenomenon is the Japanese ichiban dashi cooking stock made from two umami-

rich ingredients — kombu, which is rich in glutamate, and dried bonito, which contains large quantities of inosinate. Another example of this can be seen in Italian cuisine. Tomatoes, which are rich in glutamate, are often combined with meat, which is rich in inosinate, to create dishes such as spaghetti Bolognese. Even the humble cheese burger is a good example of how to capitalize on this synergistic effect with the glutamate in the cheese being combined with the inosinate in the meat. These culinary delights are all the result of putting into practice the understanding of and appreciation for the synergistic effect caused by bringing together the different umami components in a single dish.



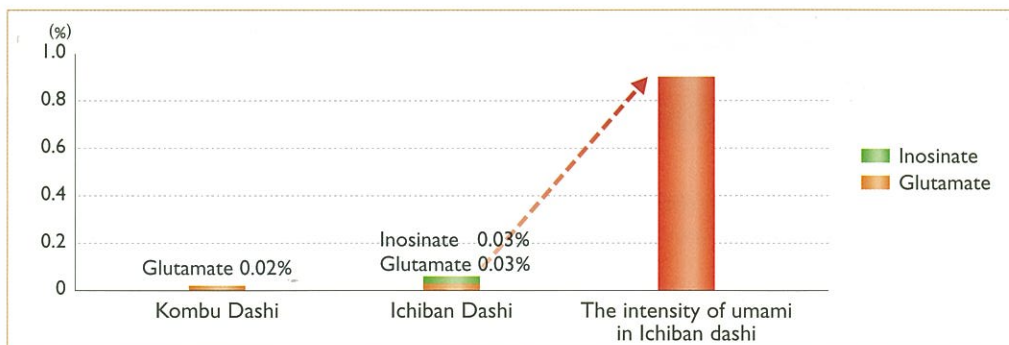
Kombu



Carrots

**Fig. 8 Umami Concentrations in Ichiban Dashi**

The synergistic effect of combining glutamate and inosinate was proven with the analysis of ichiban dashi from a luxurious traditional *ryotei* restaurant in Kyoto — the umami levels found in ichiban dashi were approximately eight times higher than those found in kombu dashi alone.



Intensity of umami  $Y = u + 1200uv$  (Y: intensity of umami u: concentration of glutamate (%) v: concentration of inosinate (%))



Spring Onions



Dried Bonito Flakes

## 7. Dashi and Umami

### Japanese Cuisine in the International Spotlight

In Japan, dashi — just like the all-purpose soup stock commonly used in many Western cuisines — is an important cooking ingredient. It is usually made from kombu seaweed and katsuobushi (dried bonito) or dried shiitake mushrooms. Kyoto is one of the most historical cities in Japan. It was the capital of Japan for about a thousand years from 794, when the Heian era began. The long history of being the center of Japan has affected the current style of Kyoto cuisine. Zen monks, who played an important role in the development of Japanese cuisine from the Muromachi period (1333 - 1573), had particular problems making dashi. Because of their strict vegetarian dishes, monks were not allowed to eat dashi made from fish. In these vegetarian dishes, dried kombu was most favored by the common people of Japan.

Today, Japanese cuisine is all the rage in many parts of the world — it is seen to be healthy, low in fat, low in calories and, therefore, a good choice for the health conscious. And the visually stunning presentation of dishes using fresh, seasonal ingredients and unique culinary techniques that draw out the essence of natural flavors have certainly played a part in increasing its popularity. The recent culinary efforts and achievements of Japanese chefs across the globe have also contributed to the growing interest in Japanese dashi and umami, evoking a new culinary style — a fusion of Japanese cuisine and local ingredients.

### Dashi

<b>Ichiban Dashi</b> Kombu + Katsuobushi	The most delicate and fragrant flavored dashi; pale in color
<b>Niban Dashi</b> Kombu + Katsuobushi	Intensely flavored dashi; made using the leftovers from ichiban dashi
<b>Niboshi Dashi</b> Niboshi (Dried Baby Sardines)	A strong-tasting dashi with a hint of bitterness
<b>Kombu Dashi</b> Kombu	Two distinct types: one is made by soaking the kombu and has a complex flavor; the other is made by heating the kombu and is highly aromatic
<b>Shojin Dashi</b> Kombu + Dried Shiitake Mushrooms	Most commonly made from kombu and dried shiitake mushrooms

### Ichiban Dashi

Ichiban dashi has a delicate flavor and an exquisite aroma. It should be made just before it is needed (rather than in advance) and served the moment it is ready in order to capitalize on its full, delicious aroma. Ichiban dashi is used mainly in dishes for which fragrance is of the utmost importance — clear soups and broths in particular. Here to the right is a basic recipe for ichiban dashi.

### Ingredients

3 liters (approx. 3.2 quarts) soft water  
100ml (approx. 3.4 fl oz) water  
20g (approx. 0.7 oz) ma kombu seaweed  
80g (approx. 2.8 oz) dried bonito flakes (honkarebushi with the *chiai* or deep red parts removed)



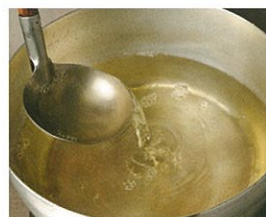
### Preparation



1 Place the kombu in a saucepan with the soft water and allow to soak (1 1/2 hours during the winter months and 20-30 minutes during the summer months). If using a large saucepan, go straight to Step 2 as the kombu will have enough time to soak while the water is heating up on the stove.



2 Heat until just before boiling. When small bubbles appear in the saucepan, take the kombu out. (If the kombu is left in too long, it will spoil, tainting the flavor of the dashi.)



3 Add 100ml (approx. 3.4 fl oz) of water to ensure that the temperature remains just below 100°C (212°F).



4 Turn off the heat and immediately add the dried bonito flakes. When the flakes sink to the bottom of the saucepan, remove the film/froth that has risen to the surface.



5 Strain the dashi through a cotton cloth immediately.



6 The ichiban dashi is now ready for use.

Recipe by Takashi Tamura, Tsukiji Tamura

## 8. Umami in the Various Cooking Stocks of the World

### Umami — the Key Ingredient for Deliciousness

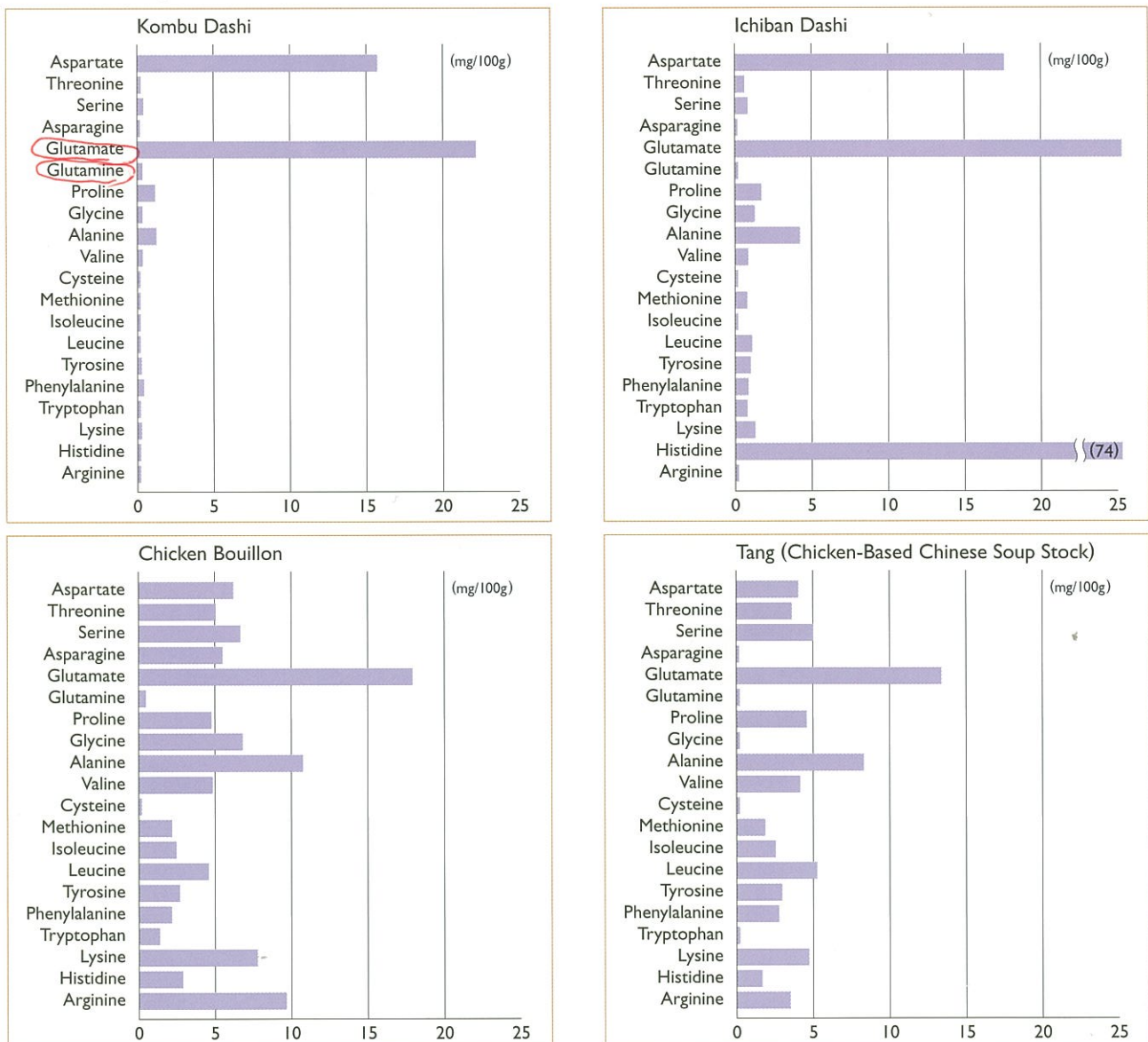
Japanese dashi. French chicken bouillon. Chinese tang. The ingredients and preparation techniques for cooking stock vary from country to country. But one thing is universally the same — glutamate is always the predominant amino acid in the recipe, making all cooking stocks rich in umami.

Japanese dashi contains free amino acids (mostly glutamate and aspartate) which contribute to its umami taste. Both glutamate and aspartate impart the umami taste, but the umami taste intensity of aspartate is only one tenth of that of glutamate. This means that the major contributor to the

umami taste in kombu dashi is glutamate, making dashi a very simple or pure umami solution. In comparison, French bouillon and Chinese tang contain a wider variety of amino acids that come from their meat and vegetable ingredients and it is the harmony of these complex components that characterizes the taste of the bouillon and tang. From childhood, the Japanese experience the simple or pure umami taste through dashi, whereas Westerners and the Chinese are used to a more complex taste. This may be one of the reasons why it has taken so long for people in the West and China to recognize the simple or pure umami taste.

**Fig. 9 The Amino Acid Composition of Various Cooking Stocks**

No matter what ingredients are used or how it is prepared, cooking stock is rich in umami.



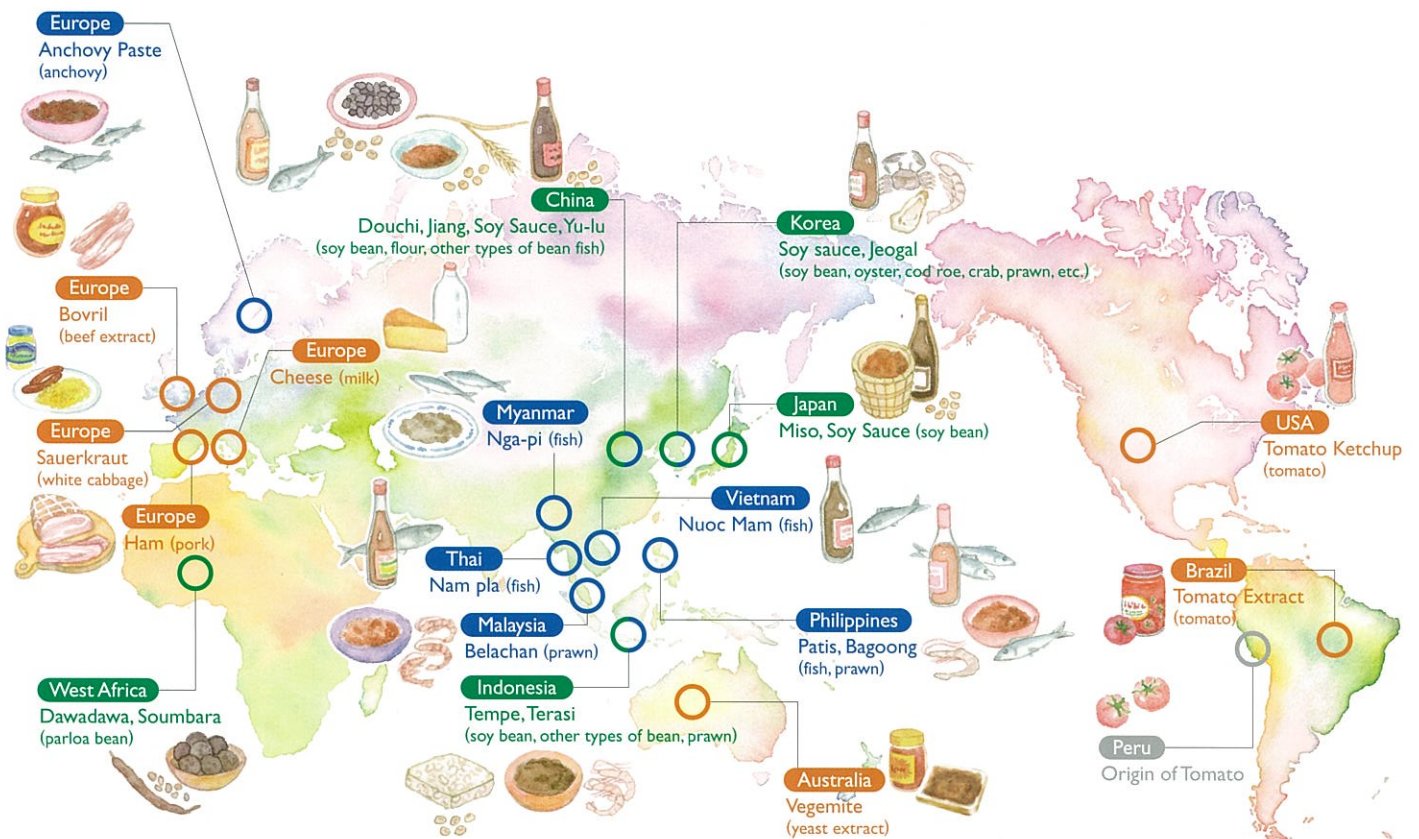
## 9. The Umami World Map




### Umami-Rich Food Across the Globe

A great variety of umami-rich foods are used in different cuisines across the globe. In Asia, umami is found mainly in beans and grains, fermented seafood-based products, dried shiitake mushrooms, kombu and seaweed. In Western cuisine, umami-rich ingredients such as beef, pork, cheese and tomatoes are used to make seasonings and condiments

and fermented or cured seasonings and condiments rich in umami that are derived from meat, fish, beans and grains are also used to add flavor to food. In reality, there are too many foods, seasonings and condiments to list here that we all use every day without even realizing that they, too, are rich in umami!

#### Umami World Map



-  Umami foods or seasonings made from fermented beans and/or grains. Normally available in either paste or liquid form
-  Umami seasonings made from fermented fish, prawns and/or other seafood. Available in either paste or liquid form
-  Umami foods made from other ingredients