

## **Umami**

### **It taste heavenly good**

Umami is not any more a Japanese word but a usual food expression. From now on we will know if a meal is salty, sour, bitter, sweet and... umami or savory. It's a polemic word but represents the meaning of the 5<sup>th</sup> taste. Here we will present you the latest discoveries about umami.

(Text: Maitte Corsin)

Since *sushi*, the taste of soy sauce and tempura was introduced we learned something more about Japanese tastes. With *obento* also came the term umami: not that long ago was only used in taste courses or among cheese tasters. The British chef Heston Blumenthal raised the term umami up to the laboratory when he started to test *konbu* seaweed. His star dish *Sound of the sea* from the famous The Fat Duck, recreates the flavor and sensations of the sea from the beach. It is made of cassava, oyster juice, soy sauce, and *konbu*. The dish was umami with a great flavor. All ingredients, specially the seaweed awaken a difficult taste hidden behind the power of salt, acid and sweet. Something very settled that is not easy to perceive. We westerners call it, to say something, savory, balanced, may be delicious?

### **The origin lays on the amino acids**

One century ago, a Japanese scientist Ikeda Kikunae was the first human to ask why asparagus, anchovy or *dashi*, an official dish in Japanese cuisine — based on seaweed, bonito flakes and *shiitake* mushrooms —, had a special taste that was different from the classic 4 tastes. Ikeda brought the *dashi* to the laboratory and found that this taste came mainly from *konbu*, which contained monosodium glutamate. I promise not to be too technical, but it is necessary to highlight that glutamate or MSG is a kind of an amino acid present in proteins and the majority of foods that are matured and more savory. When foods with high glutamate content combine with others that are rich in nucleotides — guilate or inosinate — the real taste of umami can be enhanced up to six times. The mixture of sardine with *shiitake* can provoke an unimaginable explosion of tastes.

### **The diet of the future**

Today we know more about umami than before, thanks to Japanese researchers. In Tokyo there is a non-profit organization dedicated to inform about any food that

contains umami and any study or event related to this taste. When we visited for the first time the Umami Information Center to know more about the ultimate taste, we realized that umami is a national matter. Above commercial interest to favor specific products with a trade mark, this institution collaborates with Ajinomoto, specialists in condiments, and of course, to make use of all possible aspects of the umami taste. The name of this Asian Nestle empire means "the essence of taste" not in vain they produce 33% of the worldwide glutamate. In one of the laboratories of this company works Ana San Gabriel, a Spanish researcher at the group of physiology and nutrition. She explained us about the advantages that glutamate will bring in the future. Japanese believe that once the entire umami repertoire will be known, we will be able to make more delicious dishes for sick and elderly subjects who have more difficulty to taste food. For those with a high blood pressure there are also solutions. MSG has more taste than salt but only 12% of the sodium content compared with the 39% in salt. Ana San Gabriel says that we don't know yet how the chemical reactions of the tongue reach the brain because we don't know yet how umami taste cells connect with the nerve. What researchers do know is that umami favors the final digestion since the brain receives the taste sensation. Umami provides a series of sensations that is what at the end makes food more palatable. Even babies from all nationalities learn first hand about umami. They like the breast milk, which contains a similar content of glutamate to *dashi*: something young calves can't enjoy since cow milk has a low concentration of free glutamate.

### **Tasting umami**

To remember our infancy or to understand how umami feels we tested three foods that have high content of glutamate. On the panel there were an extract of seaweed (mistake *nori* for *konbu*), a *dashi* broth from bonito flakes, a tomato, and cheese *parmigiano reggiano*. We experience a lasting sensation that was common in all ingredients. Let's cross our fingers so that our preconceived cultural impressions do not affect our judgment. The *konbu* soup left a very thin layer on the tongue with a timid salty sensation, and delicate texture? We recognize that to detect umami we have to be more than precise. We were impressed of the rare sensation. From the tomato we learned that the seeds are the richest on glutamate. Heston Blumenthal detected that by smashing the seeds and the heart of the tomato there was a stronger taste, which he confirmed at Reading University where he found that seeds are richest on glutamate. There is no coincidence that we combined meat or fish with tomato. The glutamate from the tomato matches with the inosinate of the meat. And the effect is a potent umami taste that

already the gastronomists Brillat-Savarin in the XVIII century called “osmazomo” that we know as the taste and smell of meat broth. Isn't it the same as the English called *meaty*? Our friends in Tokyo recommended us that if we want to experience clean umami taste we should try green tea in which there is amino acids and theanine. You can even see the crystals of MSG in *parmigiano reggiano* that are formed during maturation of the cheese.

### **More intense umami**

The simplicity of taste of *dashi* soup has allowed Japanese dominate the art of producing umami. The Japanese market is full of fermented products, dry, matured and concentrated sauces with a lot of umami. Also the way of cooking foods is important. According to tests made by Ajinomoto, cooking slowly releases umami compounds from meats and vegetables.

When we bring the spoon to our mouth we'll notice a stronger taste masking bitterness and other negative sensations. The 5<sup>th</sup> taste will make us release more saliva; the gastric juice will start to work so that we digest better proteins. With these data, who is willing to suffer with more fat to get more taste or to ingest the repulsive bitter?

### **Umami in the cheese burger**

The use of high fat foods in the west has delayed the appreciation for umami among westerners. The hamburger with cheese and tomato *ketchup* represents the essence of umami in our society. The meat juice, the tomato, and the cheese are ingredients with a high content in glutamate. We are closer to Asian food that we think since *ketchup* was born in Asia from *kecap*, a kind of Indonesian soy sauce. The sauce may have jumped several continents until arriving to America where it was enriched with tomato. Most of the sauces like Worcestershire or meat base (Bovril) offer extra-dose of savory ingredients. Although the word savory may have had its ups and downs among the scientific community, who could think that our *jamon Serrano* also has umami? It is known that maturation increases the content of umami that with the addition of salt increases protein degradation and dehydration. It is the same for the *chorizo*. A tomato with our *Machego* cheese guarantees the savory experience.

More bites of umami but from the sea: canned anchovy, bonito, tuna or shrimps where glycine offers a delicate taste. Oysters increase their umami content during winter and zinc increases the taste sensation. It is also interesting that we can sense umami with caviar. Does any body know if with this amino acid began the legend of foods? Something similar happens with truffles that are responsible for the symbiosis with

other glutamate salts. The Umami Information Center does not want to guess about the Sherry and the organic wines... There is no evidence yet on the presence of umami substances in these wines. This is another story.

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