



## Could Mankind Survive Without Umami?

### Umami Might be More Important Than You Think

More and more people are becoming familiar with umami, the fifth basic taste—especially with the recent “umami boom” taking place around the world. But naturally, most people don’t consider umami to be all that important. It’s a word one hears in restaurants, and possibly while studying biology in high school.

But there’s more to it than that. Umami plays such a surprisingly fundamental role in human health and nutrition that it’s not an exaggeration to state that human beings couldn’t live without it.

#### ■ Foods with Umami

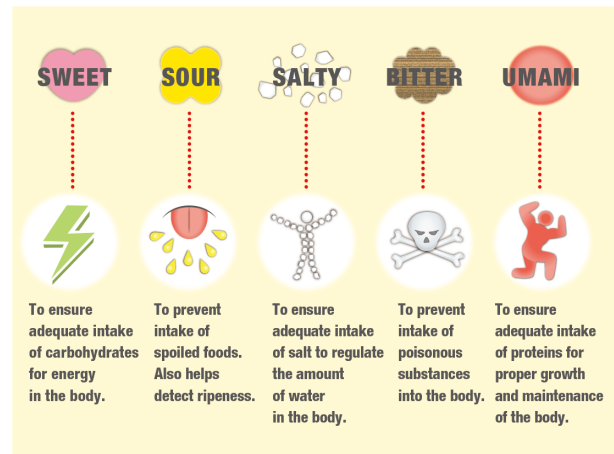


### Umami and Our Survival as a Species—the Function of Taste

All animals, including humans, need to eat to survive. And we can’t eat just anything. It might be possible to eat wood or dirt, but these things don’t really qualify as “food” because they don’t give us any nutrition. So how do we know what things we should eat, and what we shouldn’t?

The answer is taste. Every basic taste—sweet, sour, salty, bitter, and umami—is a message that tells us something about what we put into our mouth, so we can decide whether it should be eaten.

#### ■ Function of Taste



Sweetness seems to be a marker for sugars, which gives the body fast energy, and carbohydrates, which replenish the energy stores in our body. From a nutrition point of view, both of these functions are extremely important for survival. Sugar gives the energy necessary for the fight or flight response in the presence of danger, and caloric intake prevents you from becoming malnourished, starving, and wasting away from diseases.

Sodium plays a critical role in the health of any mammal, because it regulates ion and water homeostasis in the body. And, of course, the taste marker for sodium is “salty.” The fact that saltiness is enjoyed in small quantities, but not in large quantities, might be related to its role in the body—eating too much salt at once can be dangerous, so our body responds by rejecting extremely high salty solutions.

Sour tastes help us to detect the presence of acids in our foods, and like salt, it’s usually pleasurable in small quantities, but not pleasurable in large quantities. This is why sour tastes helps us to evaluate whether food is good or bad to eat. For example, when fruit is not yet ripe,



it is full of citric and other acids, and therefore tastes too sour—so we don't eat it. The same goes for the lactic acid in milk, which increases in concentration when the milk gets too old for consumption.

Strong bitterness is a marker for toxins (poisons), and we naturally reject them to protect ourselves from their harmful effects. But in small quantities, we learn as adults to like some small amounts of bitter compounds that have a positive effect in our body such as caffeine and other plant polyphenols.

And finally, umami is believed to be a signal for one of the most important and fundamental parts of nutrition: protein, which is found in abundance in meat, eggs, milk, and various beans. For this reason, it's reasonable to say that early man's affinity for umami is closely connected to hunting, the mastering of fire, and cooking, which help to provide ample and easy-to-digest protein to an entire clan or tribe. And the connection between umami and protein isn't all that surprising, when you consider that proteins are made up of amino acids. Incidentally, umami was first identified by isolating glutamate, which led to Ajinomoto Co., Inc.'s creation of MSG.

As one of the basic tastes, it's easy to see how umami has helped humans as a species to survive for millions of years. But what about today?

### What Exactly Is Umami?

It's easy for most people to imagine sweet, sour, salty, or bitter tastes. But what about umami? Compared to the other basic tastes, umami tends to be more subtle, and therefore tends to get overwhelmed by other tastes in combination.

Therefore, it's notoriously difficult to describe umami in words. Most identify it as the special savory or meaty taste of chicken soup stock, tomato, cured ham, or cured cheese. Here are some of the ways people use to describe the taste of umami:

- Savory
- Delicate and subtle
- Mellow
- Earthy, mushroom-like
- Mouth-watering
- Meaty
- Lingering, with a pleasant aftertaste

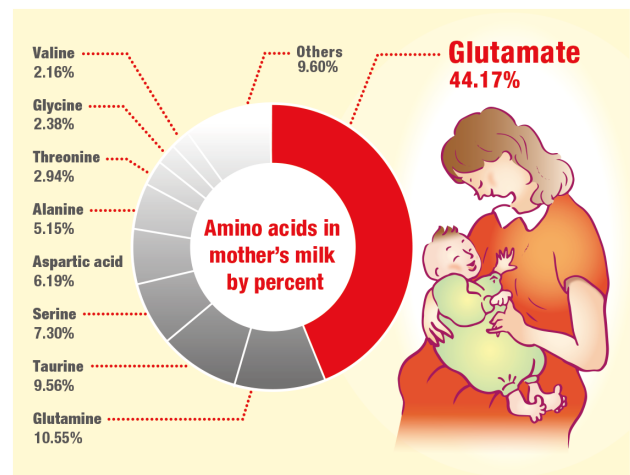
## Umami and the Infant

Even now, umami plays an extremely important role in the survival of each and every individual. This is particularly true during infancy.

Human gestation lasts for about 40 weeks, during which time a new life develops from a single fertilized cell into a fully functioning human infant, ready to enter the world. For these 40 weeks, the embryo lives in the amniotic fluid, and by around week 16, the growing baby has developed taste receptors which allow it to sample various tastes from the mother's amniotic fluid itself.<sup>1</sup> The amniotic fluid is rich with free amino acids, and among them, glutamate is found in the highest concentration.<sup>2</sup> That means that umami is one of the first tastes we experience, before we're even born!

Once an infant is born, for the first half year or so, it's only source of nutrition is breast milk. And like amniotic fluid, breast milk is rich in free amino acids, which are amino acids that are not part of proteins. Unsurprisingly, glutamate has the highest concentration among these amino acids, at 44.17%. This means that breast milk includes the taste of umami, which the infant is already familiar with from the womb. Interestingly, the flavor of umami in breast milk tends to vary according to nationality, due to the mother's diet. Therefore, for example, Japanese breast milk may have a hint of soy sauce or miso soup, while Italian breast milk may taste more like tomato and Parmesan cheese.<sup>3</sup>

### ■ Mother's Milk is High in Glutamate (Free amino acids)<sup>3</sup>



Eat Well, Live Well.



## Umami: Fundamental to our Quest to Eat Well, Live Well.

It's been more than 100 years since Ajinomoto Co. first analyzed glutamate, refined it into MSG, and coined the word "umami" to describe the way it tastes. Since then, the word umami has made its way into the dictionary, while we have diligently continued our research into the science of amino acids.

Nobody could have foreseen the crucial importance of umami to our survival as a species, or to early infant development, when we began this journey. But it's perfectly in keeping with our mission to help people to eat well and live well.

### About Ajinomoto Co., Inc.

The Ajinomoto Group is a global company with specialties in the business of food and amino acids, guided by our leading-edge bioscience and fine chemical technologies.

Based on the corporate message "Eat Well, Live Well.," we have been scientifically pursuing the possibilities of amino acids in supporting the healthy lives of people all around the world. We aim for future growth and continuous contribution to greater wellness by creating value through sustainable and innovative solutions for communities and society.

The Ajinomoto Group has offices in 35 countries and regions, and sells products in more than 130 countries and regions. In fiscal 2018, sales were 1.1274 trillion yen (10.1 billion U.S. dollars). To learn more, visit <http://www.ajinomoto.com>.

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