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NESTLÉ PROFESSIONAL NUTRITION MAGAZINE

umami Mushrooms to MSG

Finding the
Fifth Taste

MSG: Facts
and Fears



“Those who pay careful attention to their taste buds will discover in the complex flavor of asparagus, tomatoes, cheese and meat, a common and yet absolutely singular taste which cannot be called sweet, or sour, or salty, or bitter...”¹

—Dr. Kikunae Ikeda
Originator of the term “umami”

umami

demystified

Finding the fifth taste

Dr. Kikunae Ikeda, a chemist at Tokyo Imperial University, knew there was something unique about the distinctive flavor found in many savory foods. In 1908, he discovered that the naturally occurring compound glutamate was responsible for adding this flavor to the popular seaweed-based broth known as dashi, and he suggested the term umami to describe its taste. Five years later, Shintaro Kodama discovered that dried bonito flakes contained another umami substance, the ribonucleotide IMP.² In 1957, Akira Kuninaka recognized that the ribonucleotide GMP, found in shiitake mushrooms, was another source of umami.³ Eventually, umami was recognized as a legitimate fifth basic taste.

Defining umami

The word umami comes from the Japanese word “umai,” which has two meanings:

1. Delicious, nice, or palatable
2. Brothy, meaty, or savory

Both meanings convey important aspects of umami taste perception.⁴

How do we experience umami?

When you eat a food with an umami flavor, taste buds on your tongue and the soft palate of your mouth interact with your nervous system, including your brain. Umami activates all of these levels, creating what scientists call a “taste sensation”⁴ and the rest of us call delicious!

MSG

Umami flavor can also be added with monosodium glutamate (MSG), the sodium salt of glutamic acid, which Dr. Ikeda isolated and patented for use as a food additive in the 1900s. Today, instead of extracting MSG from seaweed broth, it is made by fermenting starch, sugar beets, sugar cane, or molasses in a process much like those used to make yogurt, vinegar and wine.⁵



MSG

A CONTROVERSIAL SOURCE OF UMAMI

MSG has been used as a food additive around the world since the early 1900s. Most packaged foods contain some type of additives, which are used to make them taste fresh longer, make them look more appealing, increase their availability, or make them easier to prepare.



THE FEARS

- MSG has been blamed for the so-called Chinese Restaurant Syndrome (CRS), including adverse reactions such as chest pain, flushing, headache, numbness or burning around the mouth.
- Some consumers claim to be sensitive to MSG, believing they suffer from the above symptoms after eating foods containing this additive.⁶
- MSG contains sodium, which has been linked to a possible increase in risk for some cardiovascular diseases.⁴

THE FACTS

- MSG is the sodium salt of a common amino acid, glutamic acid, which is found in proteins, many foods, and in the human body.
- Pure MSG has undergone rigorous evaluation by international scientific safety authorities. Both the Joint FAO/WHO Expert Committee on Food Additives (JECFA) and the US Food and Drug Administration (FDA) have affirmed that MSG is safe when added in normal amounts to food.
- None of the many studies carried out over the past 30 years could substantiate a link between MSG intake and adverse reactions like those mentioned above.



MSG & E numbers

The European Union (EU) developed the E number system to identify additives in 1984. The system is also used in Australia, New Zealand, the Cooperation Council for the Arab States in the Gulf, Israel and on European food products exported to North America. Some consumers are uneasy about foods with E numbers, claiming links to disorders such as hyperactivity, allergies, and food intolerance, but these claims do not have a scientific basis.⁶ Nevertheless, MSG (E621) is one additive some consumers choose to avoid.



What it means for you

The negative perceptions consumers have about MSG have influenced some businesses to stop using MSG in their foods, especially in the Western world. However, while consumers may be trending away from MSG, they still enjoy the taste of umami. Fortunately, creative chefs have unlimited ways to add this flavor sensation to their foods.

umami in *action*

We may not have had a word for the fifth flavor until the 20th century, but it has been an important part of cooking around the globe for much of human history. In addition to enjoying foods with umami flavors on their own, many cultures have found unique combinations of ingredients that intensify the experience. When glutamate-rich foods are combined with foods that contain ribonucleotides, the umami sensation is even stronger.³

Japan	Dashi made with kombu seaweed + dried bonito flakes
Italy	Sundried tomatoes + mushrooms and Parmesan cheese
China	Chinese leek or cabbage + chicken soup
Scotland	Chicken + leeks in cock-a-leekie soup
USA	Beef + carrots in pot roast

Choosing Umami Ingredients

Cooking, boiling, steaming, simmering, roasting, braising, broiling, smoking, drying, maturing, marinating, salting, aging and fermenting all change the composition of food. That means you should follow directions closely if you want to take advantage of the full umami flavor. When the recipe calls for sundried tomatoes, dried mushrooms, aged Parmesan, or fermented soy, choose the recommended food instead of fresh ingredients.

DID YOU KNOW?

The glutamate in MSG is chemically indistinguishable from glutamate found in foods. Our bodies metabolize both sources in the same way.⁵

The concept of umami is known as Xian in Chinese cuisine and the culinary arts. It uses the methods of boiling, stir-frying, stewing, braising, and steaming to add delicious umami flavoring to food. It is widely known that using Xian to prepare umami-rich stock is the basis for a successful vegetarian dish.⁷



Umami for Flavor

Umami for Health

Umami is not only an exciting way to flavor food. It's also a useful tool for enhancing a recipe while subtracting ingredients that can negatively impact our health.

Less sodium

When you add an umami-rich combination like sundried tomatoes and Parmesan cheese to a recipe, you may be able to use less salt thanks to the robust flavor of these ingredients.

Less fat

Rich, savory umami ingredients, such as the Japanese dashi broth, can also be a great substitute for smoky, but higher fat-content, ingredients like bacon. Try blending a little into a soup or mixing it with baked beans.

A promising role in elder care⁴

One of the challenges in caring for the elderly is encouraging them to consume enough nutrients. However, umami has several unique qualities that may help overcome these challenges:

- Umami can suppress unpleasant flavors.
- Umami can increase the feeling of “mouthfulness,” which is linked to our satisfaction with a food.
- Umami in soup or broth is perceived favorably.

A recent study of 65 institutionalized elderly people measured how much each person ate at lunch for 12 consecutive days. When MSG was added to nutritionally valuable foods like soups, vegetables, and starches, the participants ate more of those healthy foods and less of other foods, with the same total meal energy intake. This study suggested that MSG could be used to stimulate appropriate food choices in certain populations.⁸

DID YOU
KNOW?

An average adult consumes approximately 13 grams of glutamate from food each day.⁵



Celebrating Savory

DID YOU KNOW?

Some people have difficulty recognizing umami taste. This taste insensitivity has a genetic basis.⁹

Where to find umami?

Experimenting with umami can bring an exciting new dimension of flavor to your food. Try adding umami-rich ingredients to a few of your recipes and see how positively your customers respond.

The savory flavor can come from either glutamate or ribonucleotides, two sources that occur naturally in many foods.⁵

Going meatless

With many customers now seeking vegetarian options, umami can offer a savory and satisfying experience without the meat.

Combos to try:

- A grilled portobella can be as satisfying as a burger.
- Aged Parmesan cheese can give tomato sauce on pasta a more complete taste.
- Tomato broth makes a delicious base for a meatless soup.
- Adding peas or corn to a salad can boost the umami experience.

Glutamate contents of food⁵

FOOD	SIZE	GLUTAMATE (MG/SERVING)
Tomato juice	1 cup	827
Tomato	3 slices	339
Meat loaf dinner	9 oz.	189
Mushrooms	1/4 cup	94
Parmesan cheese	2 Tbsp	47
Corn	1/2 cup	31
Peas	1/2 cup	24
Cow's milk	1 cup	16
Canned tuna (in water)	1/2 can	8

Sources

- 1 Ikeda, Kikunae. Eighth International Congress of Applied Chemistry, Washington 1912.
- 2 Kodama S (1913). Journal of the Chemical Society of Japan 34: 751.
- 3 Kuninaka A (1960). Journal of the Agricultural Chemical Society of Japan 34: 487-492.
- 4 Bachmanov, Alexander. "Umami: Fifth Taste? Flavor Enhancer?" Monell Chemical Senses Center.
- 5 U.S. Food and Drug Administration.
- 6 "Are Additives Bad News?" Additives Simplified. www.nutripromag.com.
- 7 Nestlé R&D Center, Singapore.
- 8 Bellisle, France. Experimental studies of food choices and palatability responses in European subjects exposed to the Umami taste. Asia Pac J Clin Nutr. 2008;17 Suppl 1:376-9.
- 9 QY Chen, S Alarcon, A Tharp, OM Ahmed, NL Estrella, TA Greene, J Rucker and PA Breslin, Perceptual variation in umami taste and polymorphisms in TAS1R taste receptor genes. Am J Clin Nutr, 90, 770S-779S (2009).

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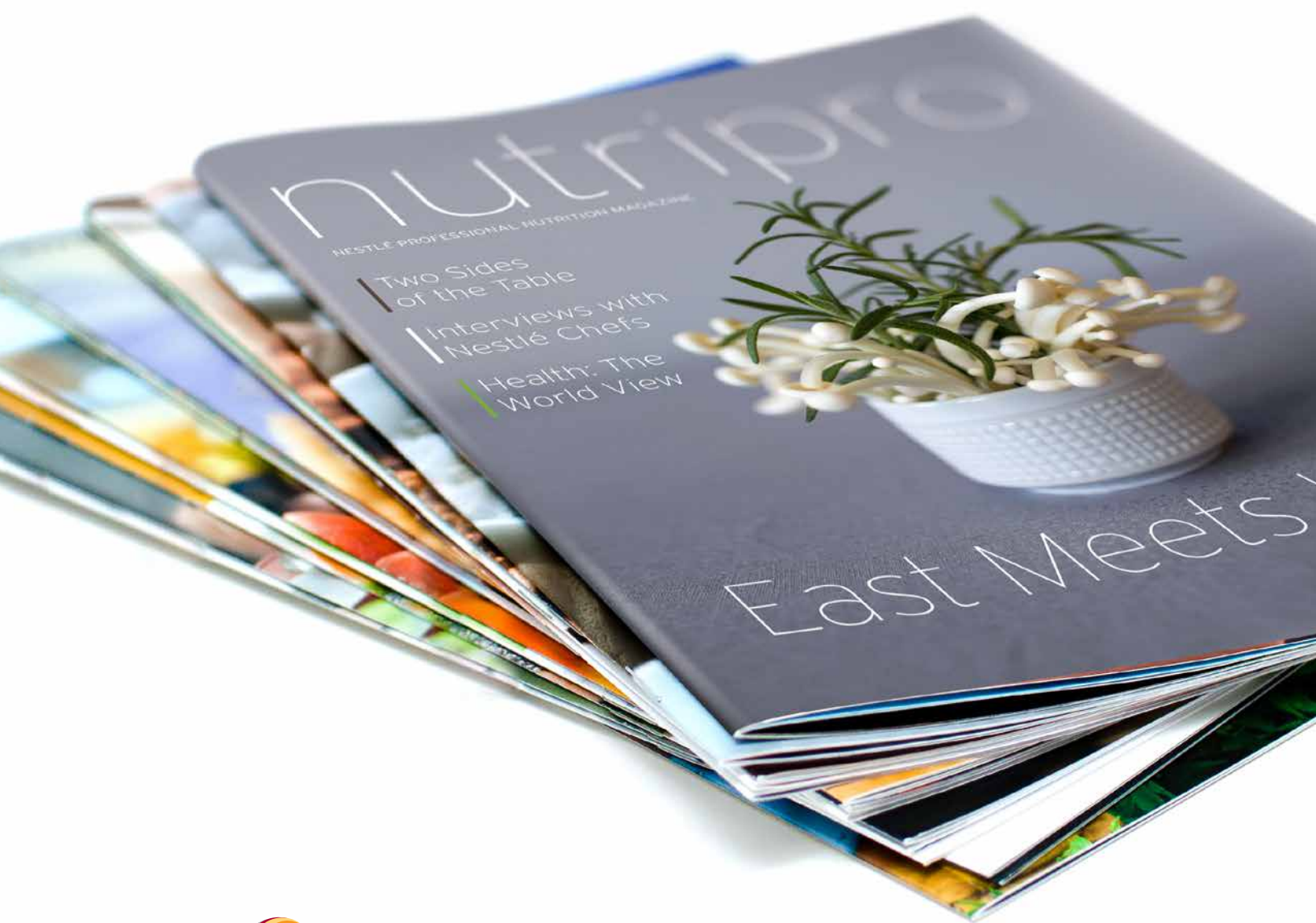
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