

# Chinese restaurant syndrome

Various authors have criticised or confirmed the relation between adverse reactions to Chinese food ('Chinese Restaurant Syndrome') and the use of monosodium glutamate. The occurrence of urticaria, angioedema or anaphylaxis in chinese or indonesian restaurants is more often due to IgE-mediated Type I food allergy, caused by consumption of shrimp, peanut or spices. Because glutamate is absorbed very quickly in the gastrointestinal tract (unlike glutamic acid-containing proteins in foods), glutamate could spike blood plasma levels of glutamate. Glutamic acid is in a class of chemicals known as excitotoxins, high levels of which have been shown in animal studies to cause damage to areas of the brain unprotected by the blood–brain barrier and that a variety of chronic diseases can arise out of this neurotoxicity. There has been debate among scientists on the significance of these findings since the early 1970s, when Olney found that high levels of glutamic acid caused damage to the brains of infant mice. The debate is complex and has focused mainly on whether the increase in plasma glutamate levels from typical ingestion levels of glutamate is enough to cause neurotoxicity and on whether humans are susceptible to the neurotoxicity from glutamic acid seen in some animal experiments.

## **Glutamic acid**

Glutamic acid and its ions and salts, called glutamates, are flavor-enhancing compounds which provide an umami (savory) taste to food. Glutamic acid is a natural constituent of many fermented or aged foods, including soy sauce, fermented bean paste, and cheese, and is also a component of hydrolyzed protein such as yeast extract. The sodium salt of glutamic acid, monosodium glutamate (MSG), is a widely

used additive in the food industry. Glutamate itself is a widespread amino acid. It is found naturally in all living cells, primarily in the bound form as part of proteins. Only a fraction of the glutamate in foods is in its "free" form, and only free glutamate can enhance the flavor of foods. Part of the flavor-enhancing effect of tomatoes, fermented soy products, yeast extracts, certain sharp cheeses, and fermented or hydrolyzed protein products (such as soy sauce and fermented bean paste) is due to the presence of free glutamate ions.

### **The role in flavor enhancement**

In April 1968, Robert Ho Man Kwok wrote a letter to the *New England Journal of Medicine*, coining the term "Chinese restaurant syndrome". The syndrome, which usually begins 15 to 20 minutes after eating the first dish, lasts for about two hours, without hangover effect. The most prominent symptoms are numbness at the back of the neck, gradually radiating to both arms and the back, general weakness and palpitations. The syndrome is often abbreviated as *CRS* and also became known under the names "Chinese food syndrome" and "monosodium glutamate symptom complex." Symptoms attributed to the Chinese restaurant syndrome are rather common and unspecific. Although many people believe that monosodium glutamate (MSG) is the cause of these symptoms, an association has never been demonstrated under rigorously controlled conditions, even in studies with people who were convinced that they were sensitive to the compound. Adequately controlling for experimental bias includes a placebo-controlled double-blinded experimental design and the application in capsules because of the strong and unique after-taste of glutamates.<sup>[9]</sup>

„China-Restaurant-Syndrom“ (C.R.S.) is a term coined for a serious reaction to monosodium glutamate (MSG) food additives, of which the first case was reported 40 years ago. Alternative names are “Hotdog Headache”, glutamate-induced asthma, and MSG Syndrome. The reaction to the syndrome includes pain and nausea, sweating, and/or flushing, tightness in the chest, trembling, numbness or burning in and

around the mouth, facial pain or swelling, as well as head and muscle pains. Children can react with fever, confusion, or a state of anxiety.

MSG food additives are used in Asian cooking; thus the name C.R.S. It is contained in soya and fish sauces, for example, being quickly absorbed by the body from ingested soup, which can then lead to problems for susceptible persons. MSG additives are labeled by the numbers E620 to E625, and have the HS Code 29224220. The taste is also known as “umami” and has a unique salty taste which can substitute the use of salt to some degree. MSG trade names are Ac´cent, Aji-No-Moto, and Vetsin.

According to epidemiological studies done in the United States in the 70s, probably 25 to 35% of the population could not tolerate the then existing MSG food levels. Since then use of these additives has increased and many see a need to control the use of MSG in the interest of a large number of people.

This issue remains controversial. Since, according to some sources, MSG is identical to glutamate naturally contained in many foods, it is absorbed and metabolized by the body in the same manner. On the other hand, damaging effects have been associated with ingesting MSG, such as those related to Alzheimer and Parkinson diseases. This was dismissed by a consensus conference lead by Nobel Preis laureate Professor Dr. Konrad Beyreuther, because MSG ingested through food cannot cross the blood-brain-barrier in healthy persons.

Although there is no scientific proof that MSG is completely safe, there is some support for the view that there are persons sensitive to larger amounts of MSG who are susceptible to adverse reactions. Furthermore MSG is suspected of triggering asthma. Allergists describe adverse reactions as pseudo-allergic. Immune system cells cause inflammation and lead to asthma or skin oedema, as happens with real allergies.

In studies, consuming between 0,3 and 1 gram MSG daily has appeared to be safe; however, in studies involving mice, this has varied according to weight. The “Hamburg Verbraucherzentrum” acknowledges MSG as dubious for persons with pseudo allergies. It is not clear what effect MSG has on persons with past illnesses. In persons with liver or intestinal diseases, the MSG blood levels might increase more readily, for example.

Consumer protection agencies advise healthy persons to avoid consuming MSG frequently; however, as a precaution. Studies have shown that MSG increases appetite. Further overshadowing MSG controversy, is the issue of its possible connection to cancer. A U.S. researcher, Shahriar Koochekpour (Buffalo University) examined tissue from 200 men with prostate cancer. He found a correlation between tumour aggressiveness and glutamate blood and receptor levels. In response to this, Gerhard Eisenbrand, food chemist and toxicologist (Technischen Uni Kaiserslautern) states,