

# CHINA RESTAURANT SYNDROME: AN UNUSUAL NEUROLOGICAL EXPERIENCE DUE TO GLUTAMATE

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## EDITORIAL

"China Restaurant Syndrome (C.R.S.)" is a term coined for a serious response to monosodium glutamate (MSG) food additives, the first cases of which were reported in 1968. Alternative names include "hotdog headaches," glutamate-induced asthma, and MSG syndrome. Response to the syndrome includes pain and nausea, sweating and/or flushing, tightness in the chest, tremor, numbness or burning in and around the mouth, facial pain or swelling, and headache and muscle pain. Children may react with fever, confusion or anxiety. In 1908, 105 years ago, a Japanese professor, Kikunae Ikeda, extracted MSG from algae broth. He then patented the taste and MSG was soon commercialized. MSG production currently involves the fermentation of starch, sugar beet, sugar cane or molasses, similar to the fermentation process used to produce yogurt, vinegar and wine.

Dietary supplements are used in Asian cuisine, hence the name of the syndrome. The synthetically produced glutamate is also found in soy and fish sauces. The body quickly absorbs the substance from the soup it ingests, which can lead to problems for sensitive people. However, the additive is also found in several other foods available to consumers, such as chips, fast food, convenience foods and canned foods. It is also added as hydrolyzed vegetable protein, vegetable protein, natural flavor and spices, which can have MSG concentrations between 12 and 40%. Malt extract, malt aroma, bouillon broth, stock aroma, natural flavor, natural beef or chicken aroma, and spices may also contain MSG. The following claims may also contain MSG or similar substances: Carrageenan enzymes, soy protein concentrate, soy protein isolate whey and protein concentrate. MSG additives are identified under numbers E621 to E625 and have HS code 29224220, other designations are monosodium glutamate flavoring or yeast extract flavoring (lower MSG concentration). Trade names include Accent, Aji-No-Moto and Vetsin. The MSG taste is also called "umami" and has a unique salty taste that can partially replace the use of salt. According to

epidemiological studies conducted in the USA in the 1970s, probably 25 to 35% of the population could not tolerate the then existing MSG foods. Since then, the use of these additives has increased. However, this question remains controversial. According to some sources, since MSG is identical to glutamate, which is naturally found in many foods, it is absorbed and metabolized by the body in the same way. On the other hand, other sources associate the intake of MSG with adverse effects that can increase the symptoms of Alzheimer's and Parkinson's disease. This particular concern was examined at a consensus conference chaired by Nobel Laureate Professor Konrad Beyreuther and concluded that MSG cannot cross the blood-brain barrier in healthy people ingested through food, but recommends further research for patients with a defective blood-brain barrier. Previously, Dr. Blaylock had been of the opinion that the blood-brain barrier did not work well in adolescents. According to him, some diseases such as heat stroke, brain trauma, encephalitis, stroke, hypertension and severe hypoglycemia can cause a blood-brain barrier disorder. Even according to a NOHA (American Nutrition Association) book review article (1995), the blood-brain barrier in older people is usually no longer completely intact. Even lead exposure can strongly affect the blood-brain barrier; this knowledge is often used in experiments. Some parts of the brain, such as the hypothalamus, do not have an effective blood-brain barrier, so glutamate can cause devastation to the endocrine system. In experiments with pregnant rats, MSG was passed through the placental barrier to the offspring, as well as the damage it causes. In addition, the animals were overweight. It has also been observed that after MSG ingestion, humans have the most sensitive MSG blood count response among the known species. MSG is also suspected of causing asthma. Allergy sufferers describe side effects as pseudoallergic. Immune system cells cause inflammation and lead to asthma or skin edema, as is the case with real allergies.

There is no scientific evidence that MSG is completely safe, and some studies confirm the view that there are people who are sensitive to larger amounts of MSG and are susceptible to side effects. In the above consensus, consumption of 16-000mg/kg per day was considered "safe" for humans. In studies with rats and mice, MSG effects varied according to weight (LD50)15g and 18g/kg in rats and mice, respectively. Another study showed that MSG caused kidney and liver damage in rats. Since unaffected free glutamate can cause harm, study data should be interpreted carefully and with great care; any amount considered "safe" could be misleading, especially with regard to possible long-term harm or danger. The Hamburg Consumer Centre recognises MSG as doubtful for people with pseudoallergies. It is not clear what effects MSG has on people with previous diseases. For example, in people with liver or bowel disease, MSG blood levels may rise more easily. In addition, as a precautionary measure, consumer protection authorities advise healthy people not to consume MSG frequently. Studies have shown that MSG increases appetite and can lead to obesity. The World Health Organization (WHO) considers MSG not harmful to individuals.

The Food & Drug Administration classifies MSG as "generally recognised as safe" (GRAS) as a food additive. It argues that MSG is chemically identical to glutamate, which occurs naturally in foods, and the body therefore metabolizes it in the same way. Normally, an adult ingests about 13 grams of glutamate per day from naturally occurring glutamate into dietary protein. On average, individuals take about 0-55 grams of MSG/day. The FDA requires the labelling of MSG for food ingredients, but for naturally contained glutamate in hydrolysed vegetable protein, autolysed yeast, hydrolysed yeast, yeast extract, soy extracts and protein isolate, no specified listing of glutamate content is required except for the listing of these ingredients. This form of glutamate is not bound to proteins and is comparable to MSG in its effects. However, foods containing this form of glutamate cannot be described as "No MSG" or "no added MSG". In addition, the FDA does not allow MSG to be classified as "spices and flavours". Other MSG-containing additives include hydrolyzed protein,

hydrolyzed vegetable protein, sodium caseinate, calcium caseinate, structured protein and hydrolyzed oatmeal. The European Union classifies MSG as a food additive. The German Nutrition Society (DGE) and the Federal Institute for Risk Assessment (BfR) believe that it is not necessary to harass consumers of MSG as long as they are healthy and eat properly. (Magnesium and vitamin C, for example, play an important role in protecting cells from damage). However, MSG is not used in baby food in Germany and the UK because the baby's blood-brain barrier is considered more permeable than that of adults. Other overshadowing MSG controversies include recent research on prostate cancer. A US researcher, Shahriar Koochekpour (Buffalo University), examined tissue from 200 men with prostate cancer. He found a connection between tumor aggressiveness and glutamate blood and receptor values. Gerhard Eisenbrand, food chemist and toxicologist (Technical University of Kaiserslautern), explained: "However, it cannot be concluded from this that glutamate is the cause for accelerated tumor growth, or increased aggressiveness." The European Food Safety Authority (Efsa) plans to take a decision on this in 2016. As MSG is widely consumed in common foods, there is a definite need for clarity about the short- and long-term health consequences. Some sources deny the existence of a "China Restaurant Syndrome", others claim that MSG can be associated with such serious diseases as Parkinson's and Alzheimer's. Glutamate is an important neurotransmitter, and there is some logic. In addition, the above-mentioned recent observations of cancer research show the importance of conclusive, justified evidence. Unfortunately, some study procedures have been found to be ineffective, which sometimes reduces concern. There is a clear need to inform consumers of the potential risks associated with the consumption of MSG and similar substances.