

4th International Food Safety, Quality & Policy Conference

December 05-06, 2016 Dubai, UAE



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Safety and efficacy of food-added monosodium glutamate (MSG): Science update

The amino acid glutamate has been added to food in various complex forms for centuries. A typical example is fish sauce with history reaching back to the Roman Empire. The sodium form of glutamate, monosodium glutamate (MSG), has been commercialized since 1909. In spite of a long history of use and the fact that glutamate is a key ingredient of savory seasonings, many food scientists know little about MSG and even less about its taste, umami (2). A number of scientific articles published recently across South Asia, Africa and Middle East reported rodent findings with pharmacologically applied MSG and derived erroneous conclusions on harmfulness of food MSG. Thus, the purpose of this presentation is to summarize safety science and the recent progress in understanding the role of MSG. Research which has been conducted over the last 40 years, in animals and humans, supported by both government and industry, has led regulatory bodies across the world to the conclusion that MSG is safe in the food supply. Among others, the lack of effects of food-added glutamates on the brain functions stems from a “simple” but critical aspect of glutamate metabolism. Less than 5% of orally ingested glutamate is absorbed from the gut into the systemic circulation. The rest is used as an oxidative substrate by the intestinal mucosa. Plasma glutamate levels therefore do not rise when glutamate is ingested in the normal diet as glutamate in dietary proteins or as free glutamate in the form of MSG. The Joint FAO/WHO Expert Committee on Food Additives (JECFA) assessed the safety of MSG as early as 1987-1988. JECFA concluded that the total dietary intake of glutamate does not represent a hazard to health and that the establishment of a numerical Acceptable Daily Intake (ADI) was not necessary. The European Community’s Scientific Committee for Food confirmed MSG safety in May 1990, and established “a group ADI not specified” for glutamate and its salts, including MSG. The US Food and Drug Administration (FDA) views MSG added to food as GRAS (Generally Recognized as Safe). Substances such as salt and pepper are all classified in the same section as MSG. In terms of safety, the basic food technology concepts are also important. Food intake of glutamate from protein sources range from 10 to 20g per day, whereas the amounts added as a flavor enhancer (free forms that include MSG) are between 0.5 – 3.0 g only. Because glutamate metabolism does not depend on its food source, it is disproportional to argue that MSG alone is the “wrong form” of glutamate. Finally, flavor-enhancing effects of MSG are dose-dependent, self-limiting and dependent on food matrix in which MSG is used (5). This means that using high quantities of MSG is detrimental to flavor properties of food and that MSG can be used only in specific food applications.

Biography

Miro Smriga has obtained his PhD in Pharmaceuticals from the University of Tokyo (Japan) in 1997. He had worked as a Scientist and a Regulatory Manager of Ajinomoto Group in Japan, Europe and the USA. He has been deeply involved with food safety issues, evaluation of food additives, enzymes and safety of amino acids. Moreover, he has been the Scientific Secretary of “International Glutamate Technical Committee” (IGTC) since April 2015. His responsibilities included scientific project management and scientific issues pertinent to monosodium glutamate and amino acid safety as well as use. He has published 40 peer-reviewed articles in neurosciences, nutrition and toxicology and authored 7 patents. He has been serving as an Editorial Board Member of the peer-reviewed Journal “Amino Acids”.

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