



Health
Canada

Santé
Canada

Health Products
and Food Branch

Direction générale des produits
de santé et des aliments

251 Sir Frederick Banting Driveway
Tunney's Pasture, PL : 2202E
Ottawa, Ontario K1A 0K9

September 10, 2010

Dear Mr. Erb;

Re: Monosodium glutamate (MSG)

In response to your email request of August 23rd, 2010 where you had requested comments on four studies on monosodium glutamate (MSG), we can offer the following:

1. In reply to the request for the article produced by Health Canada scientists (S.S. Gill et al., Potential Target Sites in Peripheral Tissues for Excitatory Neurotransmission and Excitotoxicity, *Toxicologic Pathology*, 28(2): 277-284, 2000), a copy of the article is attached. Additional articles on this subject by the same group of scientists are also enclosed.

These papers are of an observational nature in that they report on the discovery of the presence of glutamate receptors in the mammalian body. This work has led to a better understanding of the biology of glutamate receptors, but does not provide evidence of MSG toxicity from dietary sources. The food safety assessment of MSG has considered its potential to induce effects through a variety of toxicity studies, including short and long term feeding studies and the subsequent histological examination of major tissues and organs. There is no evidence that demonstrates MSG causes damage to major tissues and organs at levels present in the food supply.

2. In the article, Y. Nakanishi et al., Monosodium glutamate (MSG): A villain and promoter of liver inflammation and dysplasia, *J. Autoimmunity* 30: 42-50, 2008, observations on a model for studying obesity are described. However, the model is not considered relevant to the use of MSG as a food ingredient. The observations made as the result of using the described route of exposure (injection) in this mouse model cannot be directly extrapolated to the human situation, since it does not involve the metabolic changes that occur when MSG is ingested. The extent of exposure to MSG in this mouse model is also not relevant to the human situation. The mouse in the model system was exposed to a dose of MSG more than 300,000 times greater than the exposure

.../2

is for people who consume MSG as an added food ingredient (2000 gram/kilogram body weight as compared to a dose of 0.006 gram/kilogram body weight/day). For these reasons the study is not indicative of the potential harm that MSG may pose as a food ingredient.

3. We currently do not have a copy of the article, K. Schlett, Glutamate as a modulator of embryonic and adult neurogenesis, *Current Topics in Medicinal Chemistry*, 6 (10): 949-960, 2006. When obtained, it will be reviewed. Nonetheless, our reading of the abstract indicates to us that the paper examines glutamate as part of normal neurobiology and its role in pathology. It does not provide direct evidence of the toxicity of MSG as an ingredient in food.

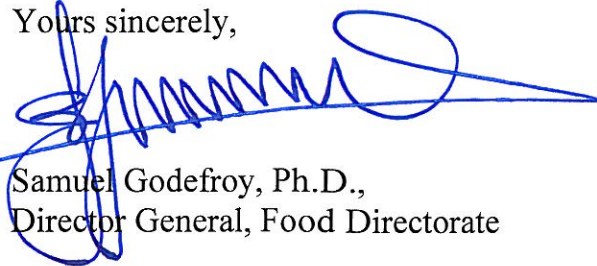
4. The article, K. He et al., Association of Monosodium Glutamate Intake with Overweight in Chinese Adults: The INTERMAP Study, *Obesity* 16 (8): 1875-1880, 2008, was reviewed and a summary and comments of the article are attached. The study was considered interesting as it showed an association between self-reported MSG consumption and overweight in adults. The study controlled for confounders such as smoking, physical activity and total energy intake. However, the study was limited in that there were a relatively small number of people in each of the groups assessed. More importantly, it was noted that the statistical method used showed only a relatively weak association between the ingestion of MSG and overweight adults, and that the confidence intervals were rather wide. In terms of health, it is not clear that the estimated increase in BMI was biologically significant.

In contrast, a recent paper, Z. Shi et al., Monosodium glutamate is not associated with obesity or a greater prevalence of weight gain over 5 years: findings from the Jiangsu Nutrition Study of Chinese adults. *British Journal of Nutrition* 104: 456-463, 2010, indicated that there is no association between MSG intake and weight gain.

Although MSG enhances the flavour of food (which may prompt people to eat more), there is no strong evidence in humans to show that the ingestion of MSG, in the absence of increased caloric intake, promotes obesity.

Overall, the papers are useful in understanding the biology of glutamate and glutamate receptors, the utility of MSG in experimental models of disease and the possibility of glutamate in weight control. However, none of the papers support a change in Health Canada's current opinion on the safety of MSG as a food ingredient.

Yours sincerely,



Samuel Godefroy, Ph.D.,
Director General, Food Directorate

cc. Meena Ballantyne, Assistant Deputy Minister, Health Products and Food Branch
Barbara Lee, Director, Bureau of Chemical Safety, Food Directorate, HPFB