

February 4, 2005

To whom it may concern;

**Re: Evaluation of Kikkoman Soy Sauce in Causing Adverse Reaction to Wheat and Soybeans.**

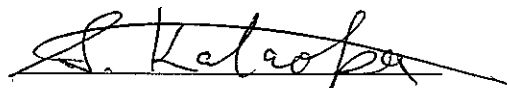
Kikkoman Soy Sauce is produced through a natural brewing process using our unique microorganisms with wheat and soybeans as the main two starting materials. Since proteins in these two crops are known to sometimes cause adverse reactions such as allergic reaction and celiac disease, here we summarize recent progress in research and governmental regulations to protect the health of sensitive individuals.

**【Protein Content】** Given the notion that protein fragments need to be large enough to possess particular structures for the development of such reactions, resultant fragments in Japanese Naturally Brewed Soy Sauce would be too small due to powerful enzymes which break them down into amino acids and tiny fragments during the brewing process. This assumption has been partly proved by findings obtained in our R&D division as well as at third-party institutes, showing that the remaining wheat gluten and its fragments were below detection limits of the latest widely used detection methods, some of which are officially recommended as detection methods for gluten by Codex and the Japanese government<sup>1)</sup> (Detection limit: RIDASCREEN Gliadin kit (r-Biopharm Co.) 1.5µg/ml, Gliadin Kit (Morinaga Co.) 0.02 µg/ml).

**【Allergic Reaction】** The lack of allergic reactivity of soy sauce was found by the use of serum from Japanese wheat-allergic patients<sup>2)</sup>. Further, thorough studies by university laboratories suggest that soy sauce is a "Natural Hypoallergenic Food," since no proteins and fragments known to cause allergic reactions were found using several investigation methods<sup>3)</sup>. It is also useful to compare the level of remaining wheat gluten and its fragments with the notion, stated by the Ministry of Health, Labour and Welfare of the Japanese Government in an "Allergy Labeling System and Food Sanitation Law" issued on March 21<sup>st</sup>, 2001<sup>4)</sup>, that labels of food containing allergenic protein at no more than a µg/ml level need not list the ingredient.

**【Celiac Disease】** So far, no physiological data is available to show whether soy sauce could cause Celiac disease. Also, there is no officially approved or recommended method for its evaluation. However, again, it is helpful to compare the level of remaining wheat gluten and its fragments with the provisional value of gluten considered by Codex Alimentarius for foods rendered gluten-free (200 µg/ml).

Given the above, although soy sauce uses soybeans and wheat as basic ingredients, any soybean protein or wheat gluten, found in soy sauce are below the limits of detection as of the date this is written. However, it is generally recommended that sensitive individuals consult their physician about consuming soy sauce.



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<sup>1)</sup>Upon request, data sheet will be available.

<sup>2)</sup>Kobayashi, M., Hashimoto, Y., Taniuchi, S. and Tanabe, S. Degradation of wheat allergen in Japanese soy sauce. *Int. J. Mol. Med.* 13: 821-827,2004.

<sup>3)</sup>Tsuji, H., Okada, N., Yamanishi, R., Bando, N., Kimoto, M. and Ogawa, T. Measurement of Gly m Bd 30K, a major soybean allergen, in soybean products by a sandwich enzyme-linked immunosorbent assay. *Biosci. Biotech. Biochem.* 59: 150-151, 1995.

Bando N, Tsuji H, Hiemori M, Yoshizumi K, Yamanashi R, Kimoto M, Ogawa T. Quantitative analysis of Gly m Bd 28k in soybean products by a sandwich enzyme-linked immunosorbent assay. *J. Nutr. Sci. Vitaminol.* 44: 655-664, 1998.

Ogawa, T., Samoto, M. and Takahashi, K. Soybean allergen and hypoallergenic soybean products. *J. Nutr. Sci. Vitaminol.* 46: 271-279, 2000.

<sup>4)</sup><http://www.mhlw.go.jp/topics/0103/tp0329-2b.html> (Japanese)