

GM Food Newsletter

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Are all types of GM food safe?

Last year, media reported with photos showing mice with giant tumors after fed with a type of genetically modified (GM) corn namely NK603 for two years. The public has raised concerns on the safety of consumption of GM food. Can we say those GM foods that have passed safety assessment are safe for human consumption? Based on the available scientific information and the view of international health authorities like World Health Organisation (WHO), the answer is YES.

The function of pre-market safety assessment

Pre-market safety assessment is a tool to assess GM foods before they can be sold in the market. It is designed to address any hazard, nutritional, toxicological or otherwise, that might be present in a newly developed GM organism, including GM plants, animals, microorganisms for food use. The modification in a GM organism usually involves the insertion of a new gene and, as a result, might change the expression of genes in the modified organism, which in turn affects the normal metabolism and level of endogenous toxins or allergens in the modified organism. In addition, it has the potential to create additional new proteins that might be toxic or allergic to susceptible individuals. To address these unintended effects, the GM organism will be compared with its conventional counterpart which is considered as safe, in terms of toxicity, allergenicity, nutritional value, and composition etc. on the basis of its long history of consumption. After comparison, if there is no significant difference between them, the GM organism can be considered as safe as its conventional counterpart. (Figure 1) For details, you may refer to our previous Newsletters (http://www.cfs.gov.hk/english/programme/programme_gmf/programme_gmf_er_res1.html).

As different GM organisms have different genes inserted in different ways, the safety of each GM food has to be assessed on a case-by-case basis. That is why we cannot take it for granted that all types of GM food

Figure 1: Brief GM food approval process



are safe for human consumption. Nevertheless, according to WHO, GM foods available on the international market have passed risk assessments and are not likely to present risks for human health.

Safety of GM corn NK603

NK603 is a type of GM corn genetically engineered to confer tolerance to a particular herbicide. It has already undergone safety assessment in a number of countries such as Canada, Australia, Japan, the United States, the European Union and mainland China, and has been approved for food use since 2000. Subsequent to the publication of the study mentioned above, several authorities, including the European Food Safety Authority, have undertaken review of the concerned study and concluded that the study design, presentation and interpretation of the data were flawed. Hence, the food safety regulatory authorities considered that there is no need to re-examine previous safety evaluations of this GM corn.

Situation in Hong Kong

In Hong Kong, like other food, GM food sold in Hong Kong should be fit for human consumption, i.e. does not cause adverse health effect after consumption. The Centre for Food Safety (CFS) has reminded traders that they should ensure their GM food products have undergone proper safety assessment and are fit for human consumption.

GM corn is the second most common GM crops, following GM soyabean, in the world. It is estimated that there are around 50 types of GM corn currently available on the market, some of which are of stacked traits. Besides GM corn NK603, some other types of GM corn such as MON810, TC 1507, and DAS-59122-7 are also available locally, as identified in a recent joint Consumer Council study on corn and corn-based products (Table 1). GM corn varieties used in these products have already passed the safety assessment of a number of countries and have been approved for human consumption (Table 1). In this study, five corn snack samples were found to contain quantifiable amount of GM corn contents exceeding the threshold value (5%). These five samples came from the United States, which is the major grower of biotech crops. The CFS issued letters to these traders reminding them to label GM food in accordance with the "Guidelines on Voluntary Labelling of GM Food".

GM corn is not the only GM food available in Hong Kong. There are other types of GM food available. To further protect public health, the CFS has proposed the introduction of a pre-market safety assessment scheme for GM food.

Table 1: Examples of GM corns approved for food use in different countries:-

GM corn	Trait	United States, Canada, Mexico	Australia, New Zealand, Japan, Korea	European Union	Switzerland
NK603	Herbicide tolerance	✓	✓	✓	—
MON810	Insect resistance	✓	✓	✓	✓
TC 1507	Herbicide tolerance, insect resistance	✓	✓	✓	—
DAS-59122-7	Herbicide tolerance, insect resistance	✓	✓	—	—

Reference: BioTrack Product Database on the website of the Organisation for Economic Co-operation and Development (OECD) [Accessed on 6 Mar 2013]

For more information on GM food, please visit our website

http://www.cfs.gov.hk/english/programme/programme_gmf/programme_gmf.html