

REGULATORY UPDATE AND CONTROL MEASURES OF MYCOTOXINS CONTAMINATION IN FOODS AND FEEDS

Dr Songsak Srianjata
Institute of Nutrition
Mahidol University, Salaya
Phuthamonthon 73170
Thailand

It has been recognized for quite sometime that molded foods are prone to the contamination of dangerous mycotoxins, the metabolites from mold growth. A number of mycotoxins found in our foods are contaminated by fungi. Some of the mycotoxins that are considered as public health or food safety problems are aflatoxins (B1, B2, G1, G2 and M1), Ochratoxin A, fumonisins, zearalenone and deoxynivalenol (DON). However, in the tropical countries as in the south and southeast area region, most problems are on the contamination of aflatoxins. Food items found to be often contaminated with aflatoxins are cereals, legumes and spices, particularly corn, peanut, ground chili and animal feeds. The most problematic aflatoxins are aflatoxins B1, B2, G1 and G2. The contamination of aflatoxins B1 in animal feed leads to the formation of metabolite, aflatoxins M1, secreted in cow's milk. Ochratoxin A contaminates cereals as barley, while fumonisins, while zearalenone and deoxynivalenol often contaminate corn and wheat. Most countries manage to solve the problem of the contamination by setting the regulatory limits for mycotoxins in foods. In Asian countries, aflatoxin levels are set for various food items. The limit levels vary from country to country; some countries set the level of total aflatoxins while some set for aflatoxin B1. The levels for total aflatoxins range from 5 µg/kg to 35 µg/kg depending on the type of food items. These levels sometimes are set by the information from limit of detection of the analytical methods. The limit levels of Aflatoxin M1 in milk are from 0.05 to 1.0 µg/kg. The monitoring has been carried out regularly in some countries, while some other countries still do not have the capability in analysis. The detection methods used are mostly HPLC and ELISA. However some semi quantitative methods are applied, such as micro column method. Other mycotoxins have different regulatory limits, but most of them are being under studied. The control measures to prevent mycotoxin contaminations can handled through a number of ways. Mostly, the measures involve from pre-harvest to post-harvest and processing to food products. HACCP is widely applied at various stages of food production and processing, while GAP and GMP are implemented in many countries.

Thailand initiated a holistic program for the prevention and reduction of aflatoxin contamination in food and feed with support from the government of Thailand for 5 years, 1997-2001. The National Codex Contact Point as the main coordinator, coordinates various agencies and organizations in terms of research and implementation. The agencies and organizations include government agencies and academic institutions. The food items covered were peanut, corn, milk and feed. The projects in the program ranged from the pre-harvest stages, including species and seed selection, soil preparation, planting methods, to post-harvest stages, including harvest methods, storage, drying and processing technique, for agricultural crops. For milk, the studies covered animal feed, feeding practice, milking and processing methods. In addition to the studies on production and processing, studies on the residue levels of various foods and feeds, the dietary intake, and the aflatoxin-albumin adduct in blood of selected groups of subjects in three regions of the country were also undertaken. The result from research studies were utilized for the establishment of national standards for the production of safe peanuts from aflatoxin contamination. The standard practice in the processing of peanut and ground peanut is without contamination by aflatoxins. It was found that the moisture content in peanut after harvest and during the storage played a very important role in the prevention of aflatoxin contamination. For corn production, HACCP was applied to prevent the contamination of this toxin. The whole process for cow milk production and

processing was studied and it was found that the animal feed is the important factor in aflatoxin contamination, especially the feed ingredient made from corn, and other agricultural waste, such as waste from coconut and corn. It was also found that the residue of aflatoxin could be detected in chicken and pork meat, liver and other visceral organs consumed as food. The experiences from this program, lead to the GAP and GMP establishment by applying HACCP at various stages to prevent and reduce the contamination of aflatoxins. So far no studies concerning other mycotoxins have been done, since the risk profile of this mycotoxin contamination is still far lower than other contaminants. It is expected that the studies of newer mycotoxins would be studied in the near future due to the increasing import of food items under the free trade agreements.

Since mycotoxins have been studied and evaluated for some period of time, it has set the appropriate stage for various countries to have strong control measures to prevent and reduce its contamination. Codex is in the process of drafting codes of practice for the prevention and reduction of mycotoxin contamination in various food items. It is hope that these codes of practice will be an important step to control the contamination of mycotoxins in food, to make the foods safe for human consumption. It will benefit to all countries to have regulatory updates in order to make our food safe for all from mycotoxin contamination since foods are moving all over the world. The contaminated food may not be consumed in one country but end up in the other country and become a food hazard risk to the other population.