

Title Screening of mycotoxin contamination in food in Kuwait
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Abstract

Mycotoxins are toxin metabolites produced by fungi growing on certain food crops and food products. Their toxicity range from gastroenteritis to cancer. Mycotoxin can contaminate several agricultural crops like corn, legume, cereals, fruits and other food crops. The presence of mycotoxins in these crops depends on many biological factors, such as temperature, humidity, seasons and pre and post harvest conditions of the crops. These toxins can be transferred to human and animal through the ingesting of contaminated feed and food. The potential risk for human warrants the need for strict regulation to control the occurrence of mycotoxin in food. In Kuwait, data on mycotoxin contamination in food is limited and the actual contamination of mycotoxin is not known. The purpose of this study was to investigate the presence of mycotoxins in susceptible food commodities and to set a data base of mycotoxin contamination in food in Kuwait.

Methods used in this study were immuno-sorbent enzyme linked assay (ELISA) and HPLC. A total of 290 food samples were collected from Kuwait supermarkets covering the all Kuwait governates. The samples were 100 liquid milk, 24 powder milk, 14 pistachio, 15 peanuts, 31 wheat flour, 25 coffee, 22 rice, 17 non-alcoholic beer, 17 spices, 12 animal feed, 13 cereal and puffed corn samples. Samples were prepared, homogenized and kept at -4 degree Celsius until the day of analysis. The samples were analyzed for aflatoxin M1, ochratoxin A and total aflatoxin.

Data obtained from the study showed 60% of milk sample (74 out of 124 milk samples) were positive with aflatoxin M1 with a range of 5.3-82.1 ppt. 25 of the positive milk samples were above the EC regulation limit (.05 ppb). In comparison with the FDA action limit, these results are beyond the limit. For the feed samples 33% were positive with aflatoxin with a range of 4.4-23.8 ppb. For cereal sample, 2 samples were positive with aflatoxin 4.1, 2.79 ppb. respectively. Among the Spices samples, 4 were found positive with a range of 0.48-10.1 ppb. Where all coffee samples were positive with ochratoxin A with a range of 0.587-4.5 ppb. Only 2 samples of nuts were positive with aflatoxin 20.3 and 23.3 ppb respectively. Non-alcoholic beer, rice and flour were free from ochratoxin and aflatoxin. The percentages of samples above the European Commission Regulation limits were 20% of milk, 8% of feed and 7% of the nut samples.

Results indicate that a potential health problem could arise if the contamination of mycotoxin is not controlled and the need for adoption of a frequent analytical surveillance by the food control agencies to control the occurrence of mycotoxin contamination in food and feed. Implementing HACCP system (Hazard Analysis and Critical Control Points)

in the food industries could be an efficient solution for controlling mycotoxin in food. This system is preventive rather than reactive and tends to protect food from microbial, chemical and physical hazards.