Occurrence of mycotoxins in talkan: a cereal-based food traditional for Turkic population

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Abstract

The consumption of cereal contaminated with mycotoxins poses a serious health risk for humans and animals. The present work aims to evaluate the presence of mycotoxins in talkan, a cereal-based food commonly consumed by the Turkic population. The presence of mycotoxins was investigated in a total of 50 samples obtained from Kazakhstan. After a preliminary screening using various ELISA kits, mycotoxins were confirmed and quantified by HPLC-MS/MS method. More than 28% of the samples were positive for at least one mycotoxin. The calculated probably daily intake for adults and children was 20% above the tolerable daily intake for aflatoxin B1 and deoxynivalenol, while it was above 100% for zearalenone, indicating a high risk for the Kazakh population. A total of 12 samples exhibited concentrations above the European maximum level for ochratoxin A, zearalenone and deoxynivalenol, however, these values were within the limits established by the Russia-Kazakhstan-Belarus Customs Union (TR CU 015/2011).

Key words: food-contamination, corn, fungi, HPLC-MS/MS, Kazakhstan

Introduction

Mycotoxins are toxins produced by filamentous fungi. They are secondary metabolites with no apparent function in the normal metabolism of the fungi. Investigations into the presence of mycotoxins in feed and food began in 1962 with the outbreak of turkey"X" disease where 100000 of turkey poults died in England. The deaths were due to the presence of a toxic substance produced by Aspergillus flavus fungus, the toxin was termed aflatoxin (Nesbitt et al. 1963). Since then, more than 400 different mycotoxins have been reported worldwide with molecular weights ranging between 50 and > 500 Da (Betina 1984). Health effects caused by the consumption of mycotoxins depend on various factors including the type of mycotoxin, its concentra-