Assessment of deoxynivalenol in wheat, corn and its products and estimation of dietary intake

ABSTRACT

The main goal of the present research was to explore the seasonal variation of deoxynivalenol (DON) in wheat, corn, and their products, collected during 2018–2019. Samples of 449 of wheat and products and 270 samples of corn and their products were examined using reverse-phase liquid chromatography with a UV detector. The findings of the present work showed that 104 (44.8%) samples of wheat and products from the summer season, and 91 (41.9%) samples from winter season were contaminated with DON (concentration limit of detections (LOD) to 2145 µg/kg and LOD to 2050 µg/kg), from summer and winter seasons, respectively. In corn and products, 87 (61.2%) samples from summer and 57 (44.5%) samples from winter season were polluted with DON with levels ranging from LOD to 2967 µg/kg and LOD to 2490 µg/kg, from the summer and winter season, respectively. The highest dietary intake of DON was determined in wheat flour 8.84 µg/kg body weight/day from the summer season, and 7.21 µg/kg body weight/day from the winter season. The findings of the work argued the need to implement stringent guidelines and create awareness among farmers, stakeholders, and traders of the harmful effect of DON. It is mostly observed that cereal crops are transported and stockpiled in jute bags, which may absorb moisture from the environment and produce favorable conditions for fungal growth. Therefore, these crops must store in polyethylene bags during transportation and storage, and moisture should be controlled. It is highly desirable to use those varieties that are more resistant to fungi attack. Humidity and moisture levels need to be controlled during storage and transportation.

Keyword: DON; Wheat; Corn; Dietary estimation; Wheat flour; Corn flour