Occurrence of the most common mycotoxins found in cereals and cereal-based food products: A review study

PP128

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Hellenic Agricultural Organization DIMITRA

Occurrence of Mycotoxins in Grains



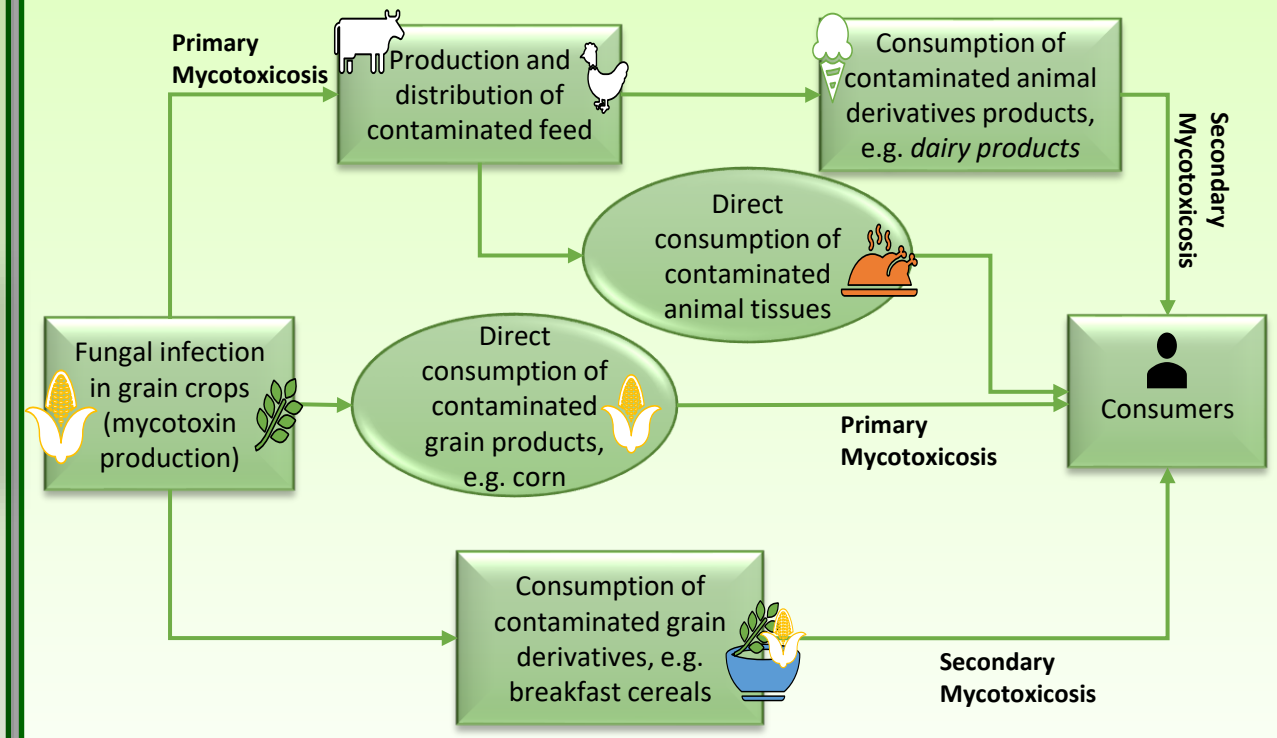
Agricultural products are susceptible to infection by fungi (e.g. *Aspergillus*, *Penicillium*, *Fusarium*, and *Claviceps*), which may produce mycotoxins as secondary metabolites.

Their occurrence is mainly affected by the environmental conditions prevailing during the harvest and storage period of cereals.

Aspergillus	*Fusarium*	*Penicilium*	*Alternaria*	*Claviceps*
Aflatoxins Sterigmatocystin Ochratoxin A	Trichothecenes Zearalenones Fumonisins Fusarium Monilifomin	Patulin Citrinin Ochratoxin A	Alternariol Tenuazonic acid	Alkaloids

According to WHO, UNO, and FAO data, is estimated that about 25% of the world's grain crops are significantly contaminated by mycotoxins. This consists of one of the main reasons that contribute to the excessive cereal grains waste (~30% of the annual worldwide production).

Mycotoxicosis in the food chain



The occurrence of mycotoxins is very common cereals and cereals derivatives, causing major problems in food production and supply chain due to its adverse effects on consumers' health.

ACKNOWLEDGEMENTS

Project "Digital Technologies as an enabler for a continuous transformation of food safety system" DiTECT—861915-2 funded by H2020 under the call SFS-37-2019.

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Global production of the most produced grains

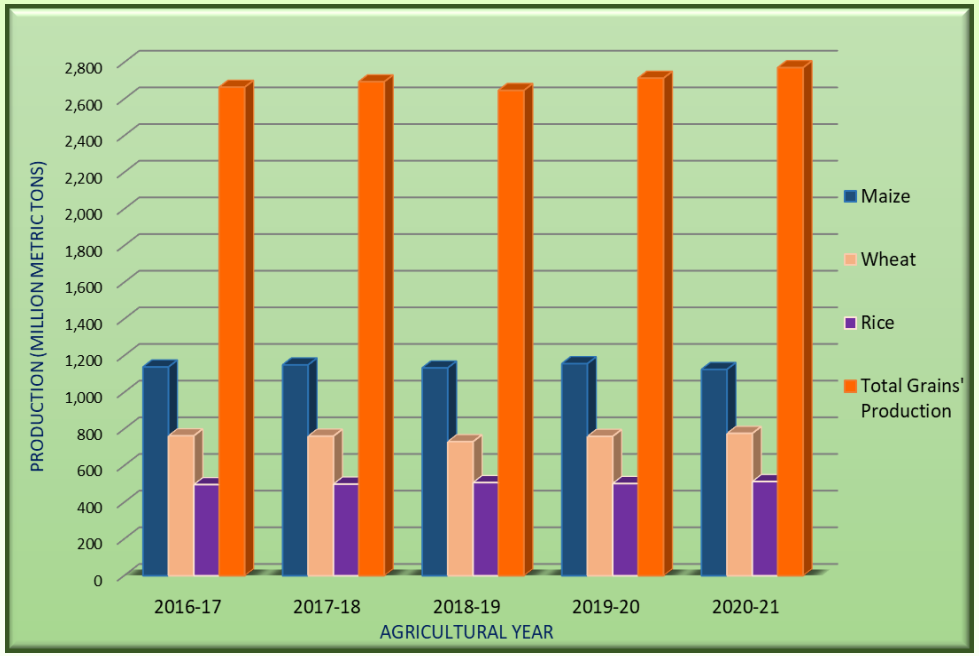
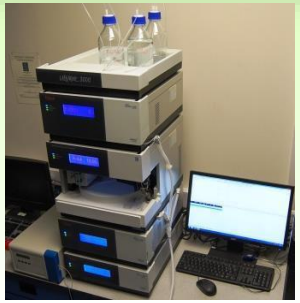


Figure 1: Worldwide production of the most common grains in the last 5 agricultural years

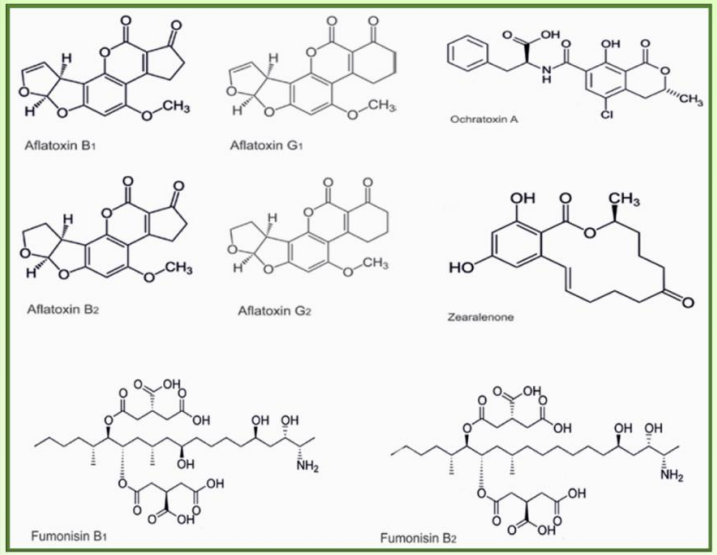
- The global production of cereals exceeds 2,667.64 billion metric tons (BMT) (2020-21) to cover the ever-increasing requirements of human diet and livestock feed.
- Maize, is the most highly produced cereal in the world (≈1,125 BMT/ 2020-21), followed by wheat and rice with annual productions of 775.8 and 505 BMT, respectively.



Analytical Methods

The most widely used are chromatographic techniques such as High-Performance Liquid Chromatography since they provide accurate and reliable results simultaneously with significantly low limits of detection and quantification. Recent approaches introduce rapid, non-invasive analytical methods such as Fourier Transform Infrared Spectroscopy to monitor the presence of mycotoxins in cereals.

Most common mycotoxins found in cereal-based products



- More than one mycotoxin may occur in cereals grains and their derived products.

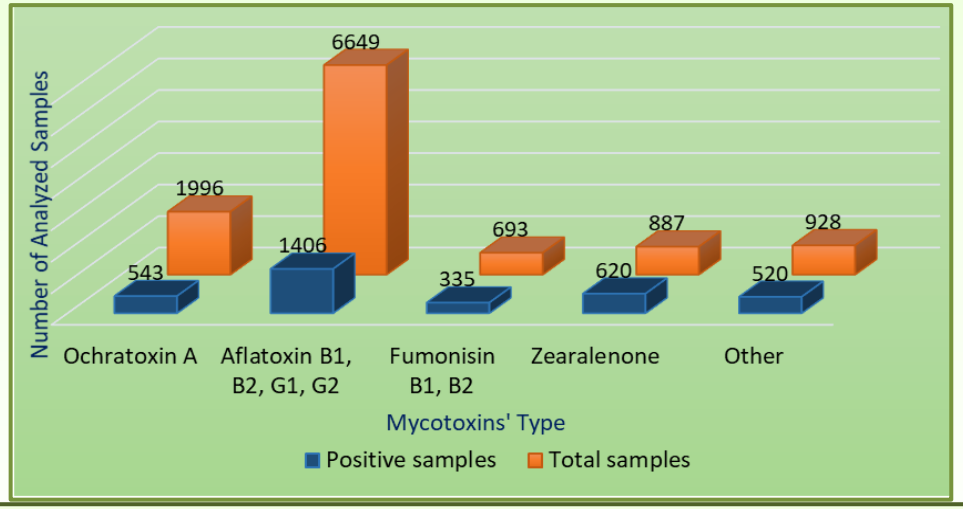


Figure 2: Occurrence of mycotoxins in cereals and cereal-based food products