

Importance of mycotoxins and rapid detection of contamination in hazelnuts

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Abstract

Mycotoxins are toxic secondary metabolites, a diverse group of chemical substances, from fungi which may affect the quality and safety of foods. The major toxic fungal genera producing mycotoxins include *Aspergillus*, *Fusarium* and *Penicillium*. Aflatoxins are the most toxic and carcinogenic form of mycotoxins. Mycotoxins require certain environmental conditions of humidity and temperature to form as well as sufficient nutrients. These conditions are often provided during the growth, harvesting, drying, processing and when it is stored in an unsuitable way for a long time. Nuts and dried fruits, the major commodities produced and traded in the basin, may be contaminated with aflatoxins and ochratoxin A. *Rhizomucor pusillus* were the most common thermophilic fungi in hazelnut. As the maximum permissible mycotoxin values range between 0.025 and 15 µg/kg and fungal infestation usually takes place in localized areas. The Codex Alimentarius set a maximum level of 10 µg/kg for total aflatoxins in almonds, hazelnuts and pistachios to eat, in 2010. Several chemical and biological systems are developed to measure of toxin contamination. Although these improve the detection of mycotoxin quantity, they do not have specificity. Mycotoxin identification is generally performed with rapid screening tests such as Spectrophotometer, Capillary Electrophoresis, Multispectral Imaging System, Chromatographic technique, Radioimmunoassay and Enzyme-Linked Immunosorbent Assays (ELISA). Different methods have advantages or limitations for the determining contaminations. This document points out the selection of best techniques with the potential use to improve the measurement and gives recommendations for the assessment of mycotoxins in hazelnut.