

Foodstuffs - Multimethod for the determination of aflatoxins, deoxynivalenol, fumonisins, ochratoxin A, T-2 toxin, HT-2 toxin and zearalenone by LC-MS/MS

EESTI STANDARDI EESSÕNA

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See Eesti standard EVS-EN 17641:2022 sisaldab Euroopa standardi EN 17641:2022 ingliskeelset teksti.	This Estonian standard EVS-EN 17641:2022 consists of the English text of the European standard EN 17641:2022.
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English Version

**Foodstuffs - Multimethod for the determination of
aflatoxins, deoxynivalenol, fumonisins, ochratoxin A, T-2
toxin, HT-2 toxin and zearalenone by LC-MS/MS**

Produits alimentaires - Multiméthode de
détermination de la teneur en aflatoxines,
déoxynivalénol, fumonisines, ochratoxine A, toxine T-2,
toxine HT-2 et zéaralénone par CL-SM/SM

Lebensmittel - Multimethode für die Bestimmung von
Aflatoxinen, Deoxynivalenol, Fumonisinen, Ochratoxin
A, T-2-Toxin, HT-2-Toxin und Zearalenon mittels LC-
MS/MS

This European Standard was approved by CEN on 24 July 2022.

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European foreword

This document (EN 17641:2022) has been prepared by Technical Committee CEN/TC 275 “Food analysis - Horizontal methods”, the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by March 2023, and conflicting national standards shall be withdrawn at the latest by March 2023.

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Introduction

Mycotoxins are fungal metabolites that may occur in various foodstuffs such as cereals, nuts, spices, fruits, oil seeds, or coffee. Mycotoxins can be produced before harvest in the crop and even after harvest if climate conditions are favourable for further fungal growth. Milk can be contaminated as well by Aflatoxin M₁, the major metabolite of Aflatoxin B₁, when cows are fed with Aflatoxin B₁ contaminated feed. To protect consumer health, maximum levels for mycotoxins in foodstuffs have been established in a broad range of food commodities including those intended for infants and young children consumption.

WARNING 1 — Suitable precaution and protection measures need to be taken when carrying out working steps with harmful chemicals. The latest version of the hazardous substances ordinance, Regulation (EC) No 1907/2006 [1], should be taken into account as well as appropriate national statements.

WARNING 2 — The use of this document can involve hazardous materials, operations and equipment. This document does not purport to address all the safety problems associated with its use. It is the responsibility of the user of this document to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

WARNING 3 — Aflatoxins are known to have carcinogenic effects and to be both acutely and chronically toxic. Aflatoxins B₁, B₂, G₁, G₂ and M₁ are classified as carcinogenic to humans (Group 1) by the International Agency for Cancer Research (IARC). Fumonisin B₁, fumonisin B₂ and ochratoxin A have been classified as possibly carcinogenic to humans (Group 2B) and zearalenone, deoxynivalenol and T-2 as not classifiable as to their carcinogenicity to humans (Group 3) [2].

1 Scope

This document describes a method using isotopically labelled standards for the quantitative determination of aflatoxins B₁, B₂, G₁, G₂ and M₁ (AFB1, AFB2, AFG1, AFG2 and AFM1), ochratoxin A (OTA), deoxynivalenol (DON), zearalenone (ZEN), T-2 and HT-2 toxins (T-2 and HT-2) and fumonisins B₁ and B₂ (FB1 and FB2) in foods by liquid chromatography (LC) coupled with tandem mass spectrometry (MS/MS).

A specific immunoaffinity column (IAC) clean-up is needed for aflatoxins (AFs) and OTA in food intended for infants and young children (e.g. infant cereals, milk-based powders), in spices, in dried fruits and in nuts.

The method has been validated through an intercollaborative study on different commodity groups: cereals and cereal-based products including food for infant and young children, nuts, spices, dried fruits and milk powder. The measuring range of each mycotoxin in these naturally contaminated and/or spiked food samples were:

— AFB1:	0,085 7 µg/kg – 11,4 µg/kg;
— AFB2:	0,079 2 µg/kg – 12,5 µg/kg;
— AFG1:	0,062 8 µg/kg – 20,9 µg/kg;
— AFG2:	0,052 0 µg/kg – 15,0 µg/kg;
— AFM1:	0,034 2 µg/kg – 0,110 µg/kg;
— OTA:	0,448 µg/kg – 17,2 µg/kg;
— DON:	45,2 µg/kg – 743 µg/kg;
— ZEN:	9,57 µg/kg – 131 µg/kg;
— T-2:	10,3 µg/kg – 57,9 µg/kg;
— HT-2:	9,50 µg/kg – 81,8 µg/kg;
— FB1:	31,1 µg/kg – 4 260 µg/kg;
— FB2:	44,2 µg/kg – 1 300 µg/kg.

The measuring ranges of the method for each mycotoxin/matrix combination are given in Table 8.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN ISO 3696, *Water for analytical laboratory use - Specification and test methods (ISO 3696)*

3 Terms and definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <https://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>