International Standard

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Vegetable fats and oils — Determination of aflatoxins B_1, B_2, G_1 and G_2 by immunoaffinity column clean-up and high-performance liquid chromatography

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Foreword

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This document was prepared by Technical Committee ISO/TC 34, *Food products*, Subcommittee SC 11, *Animal and vegetable fats and oils*, in collaboration with AOAC INTERNATIONAL.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Introduction

Aflatoxins (AFs) are carcinogenic toxins that can naturally contaminate oleaginous seeds and fruits, leading to the potential risk of the consumption of edible oils contaminated by aflatoxins. Regulatory limits for AFs in edible oils have been established in several countries. This document specifies a method for the determination of the aflatoxins B_1, B_2, G_1 and G_2 in vegetable fats and oils. The method is based on AOAC Official Method 2013.05[1] and the validation has been extended to include corn oil, sunflower oil, rapeseed oil and coconut oil.

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Vegetable fats and oils — Determination of aflatoxins B_1, B_2, G_1 and G_2 by immunoaffinity column clean-up and high-performance liquid chromatography

1 Scope

This document specifies a method for the determination of the aflatoxins B_1, B_2, G_1 and G_2 in vegetable fats and oils, including peanut oil, sesame oil, olive oil, corn oil, sunflower oil, rapeseed oil and coconut oil, using immunoaffinity column clean-up and high-performance liquid chromatography with post-column derivatization.

The limits of quantification for the aflatoxins B_1, B_2, G_1 and G_2, and for the sum of aflatoxins B_1, B_2, G_1 and G_2, are 1 µg/kg, 0,25 µg/kg, 0,5 µg/kg, 0,25 µg/kg and 1 µg/kg, respectively.

The validation was carried out over the following concentration ranges:

— aflatoxin B_1 = 1 µg/kg to 20 µg/kg;

— total aflatoxins = 2 µg/kg to 52 µg/kg.

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.

ISO 3696, *Water for analytical laboratory use — Specification and test methods*

3 Terms and definitions

No terms and definitions are listed in this document.

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

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

4 Principle

Test samples are extracted with methanol–water (a volume fraction of 55 + 45). After shaking and centrifuging, the lower layer is filtered, diluted with water, and filtered through glass microfibre filter paper. The filtrate is passed through an immunoaffinity column, and the toxins are eluted with methanol. The toxins are subjected to high-performance liquid chromatography with fluorescence detector (HPLC-FLD) analysis after post column derivatization.

WARNING — Aflatoxins are generally considered to be carcinogenic, neurotoxic and immunosuppressive. Observe appropriate safety precautions[2] for handling such compounds and in particular avoid handling in dry form as their electrostatic nature can result in dispersion and inhalation. Glassware can be decontaminated with 4 % sodium hypochlorite solution. Attention is drawn to the statement made by the International Agency for Research on Cancer (WHO)[3][4].

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