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**Traditional Chinese medicine —  
Determination of aflatoxins in natural  
products by LC-FLD**

*Médecine traditionnelle chinoise — Dosage des aflatoxines dans les  
produits naturels par CL-DF*



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## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see [www.iso.org/directives](http://www.iso.org/directives)).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 249, *Traditional Chinese medicine*.

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](http://www.iso.org/members.html).

## Introduction

Aflatoxins are naturally occurring mycotoxins produced by certain fungi, which can be found in a variety of agriculture products, contaminated foods and natural medicines, including natural products, decoction pieces and manufactured products. At least 14 different aflatoxins, mainly produced by *Aspergillus flavus* and *Aspergillus parasiticus*, have been reported to be produced in nature. Among these, aflatoxin B<sub>1</sub> (AFB<sub>1</sub>) is considered the most toxic. Other important aflatoxins include aflatoxin B<sub>2</sub>, M<sub>1</sub>, M<sub>2</sub>, G<sub>1</sub>, G<sub>2</sub>, Q<sub>1</sub>, Q<sub>2</sub> and aflatoxicol. AFB<sub>1</sub>, AFB<sub>2</sub>, AFG<sub>1</sub> and AFG<sub>2</sub> are produced by *Aspergillus flavus* and *Aspergillus parasiticus*, while AFM<sub>1</sub> and AFM<sub>2</sub> are formed from AFB<sub>1</sub> and AFB<sub>2</sub> metabolism, respectively. It has been well established that most aflatoxins are highly toxic and carcinogenic. Humans, in particular young children, are less tolerant to aflatoxin toxicity. There are frequent reports of detection of toxic aflatoxins in herbal medicines. Therefore, aflatoxins, in particular AFB<sub>1</sub> and the total amount of AFB<sub>1</sub>, AFB<sub>2</sub>, AFG<sub>1</sub> and AFG<sub>2</sub>, should be tested and limited as a quality and safety control measure for natural products. There are two main methods to detect aflatoxins in natural products: the liquid chromatography tandem mass spectrometry (LC-MS/MS) method and the liquid chromatography coupled with fluorescence detector (LC-FLD) method. LC-FLD is preferentially chosen due to its high sensitivity, high accuracy and reasonable operating cost (see [Annex A](#), [Table A.1](#)).



# Traditional Chinese medicine — Determination of aflatoxins in natural products by LC-FLD

## 1 Scope

This document specifies the methods for the determination of aflatoxins (AFB<sub>1</sub>, AFB<sub>2</sub>, AFG<sub>1</sub>, AFG<sub>2</sub>) in natural products using LC-FLD.

It is applicable to the analysis of aflatoxins in raw materials and manufactured products, including decoction pieces derived from plants and animals.

## 2 Normative references

There are no normative references in this document.

## 3 Terms and definition

For the purposes of this document, the following terms and definitions apply.

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

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

### 3.1

#### **aflatoxin**

mycotoxin produced mainly by *Aspergillus flavus* and *Aspergillus parasiticus*

Note 1 to entry: At least 13 different types of aflatoxin are produced in nature, and most of these are known to be highly toxic and carcinogenic.

Note 2 to entry: Aflatoxin B<sub>1</sub> and the sum of aflatoxins B<sub>1</sub>, B<sub>2</sub>, G<sub>1</sub> and G<sub>2</sub> shall be tested and limited.

## 4 Symbols and abbreviated terms

AFB <sub>1</sub>	aflatoxin B <sub>1</sub>
AFB <sub>2</sub>	aflatoxin B <sub>2</sub>
AFG <sub>1</sub>	aflatoxin G <sub>1</sub>
AFG <sub>2</sub>	aflatoxin G <sub>2</sub>
HPLC	high-performance liquid chromatography
LC-FLD	liquid chromatography coupled with fluorescence detector
LC-MS/MS	liquid chromatography tandem mass spectrometry