
**Animal and vegetable fats and oils —
Determination of trace elements by
inductively coupled plasma optical
emission spectroscopy (ICP-OES)**

*Corps gras d'origines animale et végétale — Détermination des
éléments traces dans les corps gras par spectrométrie d'émission
optique à plasma induit par haute fréquence (ICP-OES)*

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ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

Contents

Page

Foreword	iv
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Principle	1
5 Reagents	2
6 Apparatus	2
7 Sampling	2
8 Preparation of test sample	3
9 Procedure	3
9.1 General.....	3
9.2 Preparation of standards.....	4
9.2.1 Blank.....	4
9.2.2 Standards.....	4
9.3 Standardization.....	4
9.4 Preparation of samples.....	5
10 Calculation	5
11 Precision	5
11.1 Interlaboratory test.....	5
11.2 Repeatability.....	5
11.3 Reproducibility.....	5
12 Test report	5
Annex A (informative) Results of interlaboratory studies	7
Annex B (informative) Additional data	11
Bibliography	13

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).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: [Foreword - Supplementary information](#)

The committee responsible for this document is ISO/TC 34, *Food products*, Subcommittee SC 11, *Animal and vegetable fats and oils*.

This first edition cancels and replaces ISO/TS 21033:2011, which has been technically revised. It also incorporates the Amendment ISO/TS 21033:2011/Amd 1:2012. The scope has been revised to state that the document is not applicable to milk and milk fat products.

Animal and vegetable fats and oils — Determination of trace elements by inductively coupled plasma optical emission spectroscopy (ICP-OES)

1 Scope

This International Standard specifies an inductively coupled plasma optical emission spectroscopic method (ICP-OES) for the determination of the trace element content in oils. Depending on the dilution solvent used, most types of vegetable oils can be analysed (crude, degummed, refined, bleached, deodorized and hardened oils) and nearly all types of lecithins and phosphatides. Milk and milk products (or fat coming from milk and milk products) are excluded from the scope of this International Standard.

This method is only suitable when the elements are present in a solubilized form. Fine particles, such as bleaching earth, metal particles and rust, can result in poor recovery of the trace elements present as nebulization and atomization problems affect the ICP-OES analysis.

NOTE The only suitable non-ashing direct method for samples containing fine particles is graphite furnace atomic absorption spectrometry.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 661, *Animal and vegetable fats and oils — Preparation of test sample*

ISO 6353-2, *Reagents for chemical analysis — Part 2: Specifications — First series*

ISO 6353-3, *Reagents for chemical analysis — Part 3: Specifications — Second series*

3 Terms and definitions

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

3.1

trace element

element present in very low concentrations

Note 1 to entry: Trace element content is expressed as a mass fraction in milligrams per kilogram.

4 Principle

Solvent-diluted vegetable oils are analysed for trace elements by direct aspiration. Liquid samples are nebulized and carried into the excitation source by a flowing gas. Atoms are quantified by measuring the specific emission lines produced by atoms decaying from high energy levels.