Foodstuffs - Determination of trace elements - Determination of arsenic, cadmium, mercury and lead in foodstuffs by inductively coupled plasma mass spectrometry (ICP-MS) after pressure digestion

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NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 15763:2010 sisaldab Euroopa standardi EN 15763:2009 ingliskeelset teksti.	This Estonian standard EVS-EN 15763:2010 consists of the English text of the European standard EN 15763:2009.
Standard on kinnitatud Eesti Standardikeskuse 28.02.2010 käskkirjaga ja jõustub sellekohase teate avaldamisel EVS Teatajas.	This standard is ratified with the order of Estonian Centre for Standardisation dated 28.02.2010 and is endorsed with the notification published in the official bulletin of the Estonian national standardisation organisation.
Euroopa standardimisorganisatsioonide poolt rahvuslikele liikmetele Euroopa standardi teksti kättesaadavaks tegemise kuupäev on 16.12.2009.	Date of Availability of the European standard text 16.12.2009.
Standard on kättesaadav Eesti standardiorganisatsioonist.	The standard is available from Estonian standardisation organisation.

ICS 67.250

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 15763

December 2009

ICS 67.050

English Version

Foodstuffs - Determination of trace elements - Determination of arsenic, cadmium, mercury and lead in foodstuffs by inductively coupled plasma mass spectrometry (ICP-MS) after pressure digestion

Produits alimentaires - Dosage des éléments traces - Dosage de l'arsenic, du cadmium, du mercure et du plomb par spectrométrie d'émission avec plasma induit par haute fréquence et spectromètre de masse (ICP-MS) après digestion sous pression

Lebensmittel - Bestimmung von Elementspuren - Bestimmung von Arsen, Cadmium, Quecksilber und Blei in Lebensmitteln mit induktiv gekoppelter Plasma-Massenspektrometrie (ICP-MS) nach Druckaufschluss

This European Standard was approved by CEN on 7 November 2009.

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This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN Management Centre has the same status as the official versions.

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COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Foreword

This document (EN 15763:2009) 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 June 2010, and conflicting national standards shall be withdrawn at the latest by June 2010.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

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1 Scope

This European Standard specifies a method for the determination of arsenic, cadmium, mercury and lead in foodstuffs by inductively coupled plasma mass spectrometry (ICP-MS).

The collaborative study included foodstuffs such as carrots, fish homogenate, Mushrooms (CRM), graham flour, a simulated diet E (CRM), scampi, mussel and a Tort-2 CRM having an arsenic mass fraction ranging from 0,06 mg/kg to 21,5 mg/kg dry matter (d. m.), cadmium ranging from 0,03 mg/kg to 28,3 mg/kg d. m., mercury ranging from 0,04 mg/kg to 0,56 mg/kg d. m. and lead from 0,01 mg/kg to 2,4 mg/kg d. m.

2 Normative references

The following referenced documents are indispensable for the application 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 13805*, Foodstuffs — Determination of trace elements — Pressure digestion*

3 Principle

The test solution, obtained by pressure digestion, is nebulised and the aerosol transferred to a high frequency inductively coupled argon plasma. The high temperature of the plasma is used to dry the aerosol and to atomise and ionise the elements. The ions are extracted from the plasma by a set of sampler and skimmer cones and transferred to a mass spectrometer where the ions are separated by their mass/charge ratio and determined by a pulse-count and/or analogue detector.

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

4 Reagents

4.1 General

The concentration of the trace elements in the reagents and water used shall be low enough not to affect the results of the determination. Using a multielemental method of high sensitivity like ICP-MS, the control of the blank levels of water and acid is very important. Generally ultrapure water and acid of high purity, e.g. cleaned by sub boil distillation, are recommended. Special facilities should be used in order to avoid contamination during the steps of preparation and measurements (e.g. use of laminar flow benches or comparable clean room facilities).

4.2 Nitric acid

Mass fraction not less than $w(HNO_3)$ = 65 %, with a density of approximately 1,4 g/ml.