

Infant formula and adult nutritionals - Determination of total iodine - Inductively coupled plasma mass spectrometry (ICP-MS) (ISO 20647:2015)

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN ISO 20647:2020 sisaldab Euroopa standardi EN ISO 20647:2020 ingliskeelset teksti.	This Estonian standard EVS-EN ISO 20647:2020 consists of the English text of the European standard EN ISO 20647:2020.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 03.06.2020.	Date of Availability of the European standard is 03.06.2020.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

ICS 67.050

Standardite reprodutseerimise ja levitamise õigus kuulub Eesti Standardikeskusele

Andmete paljundamine, taastekitamine, kopeerimine, salvestamine elektroonsesse süsteemi või edastamine ükskõik millises vormis või millisel teel ilma Eesti Standardikeskuse kirjaliku loata on keelatud.

Kui Teil on küsimusi standardite autorikaitse kohta, võtke palun ühendust Eesti Standardikeskusega:
Koduleht www.evs.ee; telefon 605 5050; e-post info@evs.ee

The right to reproduce and distribute standards belongs to the Estonian Centre for Standardisation

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, without a written permission from the Estonian Centre for Standardisation.

If you have any questions about copyright, please contact Estonian Centre for Standardisation:

Homepage www.evs.ee; phone +372 605 5050; e-mail info@evs.ee

EUROPEAN STANDARD

EN ISO 20647

NORME EUROPÉENNE

EUROPÄISCHE NORM

June 2020

ICS 67.050

English Version

Infant formula and adult nutritionals -Determination of
total iodine - Inductively coupled plasma mass
spectrometry (ICP-MS) (ISO 20647:2015)

Formules infantiles et produits nutritionnels pour
adultes - Détermination de la teneur en iode total -
Spectrométrie de masse avec plasma à couplage
inductif (ICP-SM) (ISO 20647:2015)

Säuglingsanfangsnahrung und
Nahrungsergänzungsmittel für Erwachsene -
Bestimmung des Gesamtiods - Massenspektrometrie
mit induktiv gekoppeltem Plasma (ICP-MS) (ISO
20647:2015)

This European Standard was approved by CEN on 10 May 2020.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

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-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

European foreword

The text of ISO 20647:2015 has been prepared by Technical Committee ISO/TC 34 "Food products" of the International Organization for Standardization (ISO) and has been taken over as EN ISO 20647:2020 by Technical Committee CEN/TC 302 "Milk and milk products - Methods of sampling and analysis" the secretariat of which is held by NEN.

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 December 2020, and conflicting national standards shall be withdrawn at the latest by December 2020.

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

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Endorsement notice

The text of ISO 20647:2015 has been approved by CEN as EN ISO 20647:2020 without any modification.

Contents

	Page
Forewords	iv
1 Scope	1
2 Principle	1
3 Reagents and materials	1
4 Apparatus	5
5 Procedure	6
5.1 Reconstitution	6
5.2 Sample preparation	6
5.3 Addition of reagents	7
5.4 Oven digestion	7
5.5 Open vessel microwave digestion	7
5.6 Sample filtering	8
5.7 Sample dilution	8
5.8 Determination	8
5.9 Conditioning	9
5.10 Calibration	9
5.11 Sample analysis	9
5.12 Data acceptability	10
6 Calculation	10
7 Precision	11
7.1 Interlaboratory tests	11
7.2 Repeatability	11
7.3 Reproducibility	11
Annex A (informative) Precision data	12
Bibliography	13

Forewords

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 ISO/IEC Directives, Part 2 (see 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).

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

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 Trade (TBT) see the following URL: [Foreword - Supplementary information](#)

The committee responsible for this document is ISO/TC 34, *Food products*, Subcommittee SC 5, *Milk and milk products* and the International Dairy Federation (IDF), in collaboration with AOAC INTERNATIONAL. It is being published jointly by ISO and IDF and separately by AOAC INTERNATIONAL. The method described in this International Standard is equivalent to the AOAC Official Method 2012.15: *Total iodine in infant formula and adult/pediatric nutritional formula – inductively coupled plasma-mass spectrometry*.

IDF (the International Dairy Federation) is a non-profit private sector organization representing the interests of various stakeholders in dairying at the global level. IDF members are organized in National Committees, which are national associations composed of representatives of dairy-related national interest groups including dairy farmers, dairy processing industry, dairy suppliers, academics and governments/food control authorities.

ISO and IDF collaborate closely on all matters of standardization relating to methods of analysis and sampling for milk and milk products. Since 2001, ISO and IDF jointly publish their International Standards using the logos and reference numbers of both organizations.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. IDF 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).

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

ISO 20647 | IDF 234 was prepared by the IDF Standing Committee on Analytical Methods for Composition and the ISO Technical Committee ISO/TC 34, *Food products*, Subcommittee SC 5, *Milk and milk products*, in collaboration with AOAC INTERNATIONAL. It is being published jointly by ISO and IDF, and separately by AOAC INTERNATIONAL. The method described in this International Standard is equivalent to the AOAC Official Method 2012.15: *Total iodine in infant formula and adult/pediatric nutritional formula – inductively coupled plasma-mass spectrometry*.

All work was carried out by the ISO-IDF Project Group C37 of the Standing Committee on *Analytical Methods for Composition* under the aegis of its project leader, Mr Erik Konings (CH).

Infant formula and adult nutritionals — Determination of total iodine — Inductively coupled plasma mass spectrometry (ICP-MS)

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

1 Scope

This International Standard specifies a method for the quantitative determination of total iodine in infant formula and adult nutritional formula.^[1] The method is applicable to the measurement of total iodine in infant formula and adult nutritional formula from 0,5 µg/100g to 1 500 µg/100g reconstituted final product and for ready-to-feed products from 2,5 µg/100 g to 1 000 µg/100 g using ICP-MS.

Using various infant formula and adult nutritional products, the method was subjected to an interlaboratory study. Levels obtained ranged from 3,47 µg/100 g to 124 µg/100 g. For all precision data related to the interlaboratory study, see [Table A.1](#) located in [Annex A](#).

2 Principle

Digestion occurs using a potassium hydroxide (KOH) solution in an oven or open-vessel microwave system. Iodine is stabilized with ammonium hydroxide and sodium thiosulfate after digestion. The solution is brought to volume followed by filtration. The filtrate is analysed directly or after dilution by inductively coupled plasma mass spectrometry (ICP-MS).

3 Reagents and materials

During the analysis, unless otherwise stated, use only reagents of recognized analytical grade and distilled or demineralized water or water of equivalent purity. Equivalent chemicals and reagents may be used.

3.1 KOH pellets, certified ACS grade, e.g. Fisher Scientific, Fairlawn, NJ¹⁾.

NOTE KOH may contribute background levels of iodine.

3.2 Ammonium hydroxide (NH₄OH), 28 % to 30 % (m/m), certified ACS PLUS, Fisher Scientific¹⁾.

3.3 Sodium thiosulfate (Na₂S₂O₃), purity ≥ 99,99 %, metal basis, Fisher Scientific¹⁾.

3.4 Surfactant, e.g. Triton[®]X-100, Sigma, St. Louis, MO¹⁾.

3.5 Concentrated nitric acid (HNO₃), Optima, high purity, Fisher Scientific¹⁾.

3.6 Perchloric acid (HClO₄), 70 % (m/m).

1) This is an example of a suitable product available commercially. This information is given for the convenience of users of this document and does not constitute an endorsement by either ISO or IDF of the product named. Equivalent products may be used if they can be shown to lead to the same results.