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

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

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Reference numbers
ISO 20647:2015(E)
IDF 234:2015(E)

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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).

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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.

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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).

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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.