

Milk, milk products, infant formula and adult
nutritional products - Determination of minerals and trace
elements - Inductively coupled plasma atomic emission
spectrometry (ICP-AES) method (ISO 15151:2018)

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN ISO 15151:2020 sisaldab Euroopa standardi EN ISO 15151:2020 ingliskeelset teksti.	This Estonian standard EVS-EN ISO 15151:2020 consists of the English text of the European standard EN ISO 15151:2020.
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.
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Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

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English Version

Milk, milk products, infant formula and adult nutritionals -
Determination of minerals and trace elements -
Inductively coupled plasma atomic emission spectrometry
(ICP-AES) method (ISO 15151:2018)

Lait, produits laitiers, formules infantiles et produits nutritionnels pour adultes - Détermination de la teneur en minéraux et en oligo-éléments - Méthode par spectrométrie d'émission atomique avec plasma induit par haute fréquence (ICP-AES) (ISO 15151:2018)

Milch, Milcherzeugnisse, Säuglingsnahrung und Nahrungsergänzungsmittel für Erwachsene - Bestimmung von Mineralien und Spurenelementen - Verfahren mit induktiv gekoppelter Plasma-Atomemissionsspektrometrie (ICP-AES) (ISO 15151:2018)

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

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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 15151:2018 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 15151:2020 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of an identical text or by endorsement, at the latest by December 2020, and conflicting national standards shall be withdrawn at the latest by December 2020.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 15151:2018 has been approved by CEN as EN ISO 15151:2020 without any modification.

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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).

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This document was prepared by Technical Committee 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 document is equivalent to the AOAC Official Method 2011.14: *Minerals and Trace Elements in Infant Formula*.

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.

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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This document was prepared by the IDF Standing Committee on Analytical Methods for Composition and 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 document is equivalent to the AOAC Official Method 2011.14: *Minerals and Trace Elements in Infant Formula*. All work was carried out by the ISO/IDF Action Team on C17 of the Standing Committee on Analytical Methods for Composition under the aegis of its project leader, Mr H. Crujisen (NL).

Milk, milk products, infant formula and adult nutritionals — Determination of minerals and trace elements — Inductively coupled plasma atomic emission spectrometry (ICP-AES) method

1 Scope

This document specifies a method for the quantitative determination of calcium (Ca), copper (Cu), iron (Fe), magnesium (Mg), manganese (Mn), phosphorus (P), potassium (K), sodium (Na) and zinc (Zn) using inductively coupled plasma atomic emission spectrometry (ICP-AES). The method is applicable for milk, dried milk, butter, cheese, whey, dried whey, infant formula and adult nutritional formula in the ranges given in [Table 1](#).

Table 1 — Analytical ranges

	Ca	Cu	Fe	Mg	Mn	P	K	Na	Zn
Lower analytical range ^a , in mg/100 g	20	0,03	0,5	3	0,01	15	10	10	0,2
Upper analytical range ^a , in mg/100 g	1 280	1,2	20	110	1,0	800	2 000	850	18

^a concentrations apply to

- milk and “ready-to-feed” liquids as-is, using a typical sample size of 4 g per final analytical solution volume of 25 ml and
- reconstituted milk powder, infant formula powders and adult nutritional powders (25 g into 200 g of water), using a typical sample size of mass of the reconstituted slurry per final analytical solution volume of 25 ml.

Ranges for non-reconstituted dairy ingredients (butter, cheese, whey powders, whey protein concentrates) are adjusted proportionally upward from these values based upon the sample size used for the ingredient. For example, if 0,6 g of cheese is digested the ranges will be $4 \text{ g}/0,6 \text{ g} = 6,7 \times$ higher.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

ISO 648, *Laboratory glassware — Single-volume pipettes*

ISO 1042, *Laboratory glassware — One-mark volumetric flasks*

ISO 3696, *Water for analytical laboratory use — Specification and test methods*

3 Terms and definitions

No terms and definitions are listed in this document.

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/>