

Foodstuffs - Determination of calcium, copper, iron, magnesium, manganese, phosphorus, potassium, sodium, sulfur and zinc by ICP-OES

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

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English Version

**Foodstuffs - Determination of calcium, copper, iron,
magnesium, manganese, phosphorus, potassium, sodium,
sulfur and zinc by ICP-OES**

Produits alimentaires - Dosage du calcium, du cuivre,
du fer, du magnésium, du manganèse, du phosphore,
du potassium, du sodium, du soufre et du zinc par ICP-
OES

Lebensmittel - Bestimmung von Calcium, Kupfer, Eisen,
Magnesium, Mangan, Phosphor, Kalium, Natrium,
Schwefel und Zink mit ICP OES

This European Standard was approved by CEN on 20 February 2017.

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European foreword

This document (EN 16943:2017) 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of an identical text or by endorsement, at the latest by November 2017, and conflicting national standards shall be withdrawn at the latest by November 2017.

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1 Scope

This European Standard describes a method for the determination of calcium, copper, iron, magnesium, manganese, phosphorus, potassium, sodium, sulfur and zinc in different foodstuffs using optical emission spectrometry with inductively coupled plasma (ICP-OES) after pressure digestion.

This method has been validated in an interlaboratory study according to ISO 5725 [1] on infant formula soya based, cheese, chicken meat, wheat flour, apple juice, lobster and milk (see elements ranges Table 1 and validation data in Annex B).

HorRat values greater than 2 have been observed for certain analyte/matrix combinations during the validation study.

Table 1 — Validated element ranges

Element	Range mg/kg
Calcium	70 to 7178
Copper	0,60 to 16,40
Iron	0,88 to 77
Magnesium	45 to 1 174
Manganese	0,44 to 5,12
Phosphorus	72 to 9 708
Potassium	605 to 14 312
Sodium	11 to 2 220
Sulfur	26 to 8 542
Zinc	0,16 to 43,5

At European or International level, vertical standards for the determination of specific minerals can exist, e.g. for milk and milk products or for animal and vegetable fats and oils [2].

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.

EN 13804, *Foodstuffs - Determination of elements and their chemical species - General considerations and specific requirements*

EN 13805, *Foodstuffs - Determination of trace elements - Pressure digestion*

3 Principle

After digestion of the sample with the pressure digestion process described in EN 13805, calcium, copper, iron, magnesium, manganese, phosphorus, potassium, sodium, sulfur and zinc are determined quantitatively with the ICP-OES [2]. The digestion solution is nebulized, the aerosol is directed into an inductively coupled argon plasma, where the elements are atomized and excited for radiation. The emission radiation is resolved spectrally and its intensity determined at element-specific wavelengths with a detector system. Ionization interference can be minimized using an ionization buffer.