SLOVENSKI STANDARD
oSIST prEN 18338:2026

01-maj-2026

Pristnost živil - Priprava vzorcev za analizo izotopskih razmerij sadnih in zelenjavnih sokov ter sorodnih proizvodov

Food authenticity - Sample preparation for isotope ratio analysis of fruit and vegetable juices and related products

Lebensmittelauthentizität - Probenvorbereitung für die Isotopenverhältnisanalyse von Frucht- und Gemüsesäften und verwandten Produkten

Authenticité des aliments - Préparation des échantillons pour l'analyse des rapports isotopiques des jus de fruits et de légumes et des produits dérivés

Ta slovenski standard je istoveten z: **prEN 18338**

ICS:

67.050	Splošne preskusne in analizne metode za živilske proizvode	General methods of tests and analysis for food products

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

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prEN 18338

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ICS 67.050

English Version

Food authenticity - Sample preparation for isotope ratio analysis of fruit and vegetable juices and related products

Authenticité des aliments - Préparation des échantillons pour l'analyse des rapports isotopiques des jus de fruits et de légumes et des produits dérivés

Lebensmittelauthentizität - Probenvorbereitung für die Isotopenverhältnisanalyse von Frucht- und Gemüsesäften und verwandten Produkten

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 460.

If this draft becomes a European Standard, 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.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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

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European foreword

This document (prEN 18338:2026) has been prepared by Technical Committee CEN/TC 460 “Food Authenticity”, the secretariat of which is held by DIN.

This document is currently submitted to the CEN Enquiry.

This document is intended to serve as a framework in which the analysts can define their own analytical work within the parameters of this document.

Introduction

A significant difference exists between the isotopic content of sugars, and other subsequent molecules in biosynthesis, from plants following the different photosynthetic C3 (Calvin cycle), C4 (Hatch-Slack) or CAM (Crassulean acid metabolism) cycles. Differences also exist due to climatological conditions during cultivation of fruits and vegetables. Isotopic contents of the sugar, pulp, as well as ethanol obtained by fermentation, are correlated within the same juice. Stable isotope ratios of these metabolites and their correlation have the potential to reveal information on authenticity and adulterations such as exogenous sugar addition, organic acids addition, etc. [1].

The relevant standards that could be used after sample preparation to quantify the isotopic ratios of the following nuclei: $^{13}C/^{12}C$, $^{15}N/^{14}N$ and $^{2}H/^{1}H$ are:

a) EN 18054:2025 “Determination of C and/or N isotope ratios in food by Elemental Analyzer – Isotope Ratio Mass Spectrometry (EA- IRMS)” [2]

b) AOAC Official Method 995.17 Beet Sugar in Fruit Juices. Site Specific Natural Isotope Fractionation-Nuclear Magnetic Resonance (SNIF-NMR) Method [3]

Following this protocol will result in isotope delta values or ppm (parts per million) with associated measurement uncertainties.

Although other instrumental techniques can be applied to determine $\delta^{13}C$ or $\delta^{15}N$, these other techniques are not covered by this document.

For the determination of the $^{13}C/^{12}C$ and, $(D/H)_I$ isotope ratio in grape juice, the International Organization of Vine and Wine (OIV) methods are available as reference methods [4].

1 Scope

This document describes a method for sample preparation for the determination of C, N and H isotope ratio values in different fractions (sugar and pulp) of fruit and vegetable juices and their derivatives (concentrates, nectars, beverages etc.) by Elemental Analyser-Isotope Ratio Mass Spectrometry (EA-IRMS) or Isotope Ratio Measurement-Deuterium Nuclear Magnetic Resonance Spectroscopy (*irm*-^{2}H-NMR).

It also covers ethanol produced by the fermentation of fruit and vegetable juices, and their derivatives.

Sample measurement is not included within this document.

This document does not concern the analytical methods after sample preparation, namely methods using IRMS (Isotope Ratio Mass Spectrometry) technique and isotope ratio measurement-deuterium nuclear magnetic resonance spectroscopy (*irm*-^{2}H-NMR), also known as SNIF-NMR (Site-specific Natural Isotopic Fractionation by Nuclear Magnetic Resonance), used to quantify the isotopic ratios of the following nuclei: $^{13}C/^{12}C$, $^{15}N/^{14}N$ and $^{2}H/^{1}H$.

The interpretation of the obtained isotope delta values is not covered by this document.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp/

— IEC Electropedia: available at https://www.electropedia.org/

3.1
isotope delta
δ
stable isotope ratio of a sample expressed relative to a reference

Note 1 to entry: For carbon, this expression is given in Formula (1):

$$\delta_{\text{ref}}\left(^{13}\text{C} / {}^{12}\text{C}\right) = \frac{R_{\text{sample}}\left(^{13}\text{C} / {}^{12}\text{C}\right)}{R_{\text{reference}}\left(^{13}\text{C} / {}^{12}\text{C}\right)} \quad (1)$$

Note 2 to entry: The term $\delta_{\text{ref}}(^{13}C/^{12}C)$ is often changed from the IUPAC format to $\delta^{13}C_{\text{ref}}$; this document uses the IUPAC format for familiarity.

Note 3 to entry: To ensure international comparability of isotope delta values, a common reference is used; this reference is an international measurement standard assigned by convention with isotope delta value exactly equal to zero.

Note 4 to entry: Carbon isotope delta values for natural isotopic abundance in food materials are small and expressed in permille (‰) rather than in their native form.