

Molecular biomarker analysis - DNA barcoding of fish and fish products using defined mitochondrial cytochrome b and cytochrome c oxidase I gene segments (ISO 17174:2024)

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

<p>See Eesti standard EVS-EN ISO 17174:2024 sisaldab Euroopa standardi EN ISO 17174:2024 ingliskeelset teksti.</p> <p>Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.</p> <p>Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 18.09.2024.</p> <p>Standard on kättesaadav Eesti Standardimis- ja Akrediteerimiskeskusest.</p>	<p>This Estonian standard EVS-EN ISO 17174:2024 consists of the English text of the European standard EN ISO 17174:2024.</p> <p>This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation and Accreditation.</p> <p>Date of Availability of the European standard is 18.09.2024.</p> <p>The standard is available from the Estonian Centre for Standardisation and Accreditation.</p>
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EUROPEAN STANDARD

EN ISO 17174

NORME EUROPÉENNE

EUROPÄISCHE NORM

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Supersedes CEN/TS 17303:2019

English Version

Molecular biomarker analysis - DNA barcoding of fish and fish products using defined mitochondrial cytochrome b and cytochrome c oxidase I gene segments (ISO 17174:2024)

Analyse de biomarqueurs moléculaires - Codes-barres d'ADN de poissons et de produits à base de poisson à l'aide de segments de gènes mitochondriaux de cytochrome b et cytochrome c oxydase I (ISO 17174:2024)

Untersuchung auf molekulare Biomarker - DNA-Barcoding von Fisch und Fischprodukten anhand definierter mitochondrialer Cytochrom b- und Cytochrom c-Oxidase I-Genabschnitte (ISO 17174:2024)

This European Standard was approved by CEN on 7 September 2024.

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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

This document (EN ISO 17174:2024) has been prepared by Technical Committee ISO/TC 34 "Food products" in collaboration with Technical Committee CEN/TC 460 "Food Authenticity" 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 March 2025, and conflicting national standards shall be withdrawn at the latest by March 2025.

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.

This document supersedes CEN/TS 17303:2019.

This document has been prepared under a standardization request addressed to CEN by the European Commission. The Standing Committee of the EFTA States subsequently approves these requests for its Member States.

Any feedback and questions on this document should be directed to the users' national standards body/national committee. A complete listing of these bodies can be found on the CEN website.

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Endorsement notice

The text of ISO 17174:2024 has been approved by CEN as EN ISO 17174:2024 without any modification.

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Foreword

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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 document 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 34, *Food products*, Subcommittee SC 16, *Horizontal methods for molecular biomarker analysis*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 460, *Food authenticity*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

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Introduction

Food safety is a key aspect in terms of consumer protection. In the last three decades, globalization has taken place in the trade of food. Fish trade channels are becoming steadily longer and more complicated so that sophisticated traceability tools are needed to ensure food safety. Correct food labelling is a prerequisite to ensure safe fish products and fair trade as well as to minimize illegal, unreported and unregulated (IUU) fishing. In particular, the fact that fish is increasingly being processed in export countries makes the identification of species by morphological characteristics impossible. The development of reliable, harmonized and standardized protocols for the authentication of fish products is necessary to ensure consumer protection and the detection of potential food fraud.

Molecular biomarker analysis — DNA barcoding of fish and fish products using defined mitochondrial cytochrome b and cytochrome c oxidase I gene segments

1 Scope

This document specifies a method for the identification of single fish and fish fillets to the level of genus or species. It allows the identification of a large number of commercially important fish species using DNA barcoding.

This method was validated on raw fish. Laboratory experience indicates additional applicability to processed fish products (e.g. cold smoked, hot smoked, salted, frozen, cooked, fried and deep-fried samples).

The described method is usually unsuitable for the analysis of highly processed foods (e.g. tins of fish with highly degraded DNA where the fragment lengths are not sufficient for amplification of the targets). Furthermore, it does not apply to complex fish products containing mixtures of two or more fish species.

The identification of fish species is carried out by PCR amplification of either a segment of the mitochondrial cytochrome b gene (*cytb*) or the cytochrome c oxidase I gene (*cox1*, *syn COI*), or both, followed by sequencing of the PCR products and subsequent sequence comparison with entries in databases.

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 16577, *Molecular biomarker analysis — Vocabulary for molecular biomarker analytical methods in agriculture and food production*

ISO 20813, *Molecular biomarker analysis — Methods of analysis for the detection and identification of animal species in foods and food products (nucleic acid-based methods) — General requirements and definitions*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 16577 and the following 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

alignment

sequence alignment

arrangement of nucleic acid sequences or protein sequences according to regions of similarity

Note 1 to entry: Alignment is a process or result of matching up the nucleotide residues of two or more biological sequences to achieve maximal levels of *identity* (3.3).

[SOURCE: ISO 16577:2022, 3.7.18, modified — “alignment” was added as the preferred term; Note 1 to entry was added.]