



# SLOVENSKI STANDARD SIST EN ISO 11133:2014

01-oktober-2014

Nadomešča:

SIST ISO 9998:1998

SIST-TS CEN ISO/TS 11133-1:2009

SIST-TS CEN ISO/TS 11133-2:2004

SIST-TS CEN ISO/TS 11133-2:2004/A1:2011

---

**Mikrobiologija živil, krme in vode - Priprava, izdelava, skladiščenje in preskušanje lastnosti gojišč (ISO 11133:2014)**

Microbiology of food, animal feed and water - Preparation, production, storage and performance testing of culture media (ISO 11133:2014)

Mikrobiologie von Lebensmitteln, Futtermitteln und Wasser - Vorbereitung, Herstellung, Lagerung und Leistungsprüfung von Nährmedien (ISO 11133:2014)

Microbiologie des aliments, des aliments pour animaux et de l'eau - Préparation, production, stockage et essais de performance des milieux de culture (ISO 11133:2014)

**Ta slovenski standard je istoveten z: EN ISO 11133:2014**

---

**ICS:**

07.100.20	Mikrobiologija vode	Microbiology of water
07.100.30	Mikrobiologija živil	Food microbiology

**SIST EN ISO 11133:2014**

**en,fr,de**

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

[SIST EN ISO 11133:2014](#)

<https://standards.iteh.ai/catalog/standards/sist/db01afbe-169b-4e9a-9efa-559be38d06b8/sist-en-iso-11133-2014>

EUROPEAN STANDARD

EN ISO 11133

NORME EUROPÉENNE

EUROPÄISCHE NORM

May 2014

ICS 07.100.30

Supersedes CEN ISO/TS 11133-1:2009, CEN ISO/TS  
11133-2:2003

English Version

Microbiology of food, animal feed and water - Preparation,  
production, storage and performance testing of culture media  
(ISO 11133:2014, Corrected version 2014-11-01)

Microbiologie des aliments, des aliments pour animaux et  
de l'eau - Préparation, production, stockage et essais de  
performance des milieux de culture (ISO 11133:2014,  
Version corrigée 2014-11-01)

Mikrobiologie von Lebensmitteln, Futtermitteln und Wasser  
- Vorbereitung, Herstellung, Lagerung und  
Leistungsprüfung von Nährmedien (ISO 11133:2014,  
korrigierte Fassung 2014-11-01)

This European Standard was approved by CEN on 20 March 2014.

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. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

**Contents**

Page

Foreword.....3

**iTeh STANDARD PREVIEW  
(standards.iteh.ai)**

SIST EN ISO 11133:2014

<https://standards.iteh.ai/catalog/standards/sist/db01afbe-169b-4e9a-9efa-559be38d06b8/sist-en-iso-11133-2014>

## Foreword

This document (EN ISO 11133:2014) has been prepared by Technical Committee ISO/TC 34 "Food products" in collaboration with 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 2014, and conflicting national standards shall be withdrawn at the latest by November 2014.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes CEN ISO/TS 11133-2:2003, CEN ISO/TS 11133-1:2009.

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, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

### Endorsement notice

The text of ISO 11133:2014, Corrected version 2014-11-01 has been approved by CEN as EN ISO 11133:2014 without any modification.

[SIST EN ISO 11133:2014](https://standards.iteh.ai/catalog/standards/sist/db01afbe-169b-4e9a-9efa-559be38d06b8/sist-en-iso-11133-2014)

<https://standards.iteh.ai/catalog/standards/sist/db01afbe-169b-4e9a-9efa-559be38d06b8/sist-en-iso-11133-2014>

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

[SIST EN ISO 11133:2014](#)

<https://standards.iteh.ai/catalog/standards/sist/db01afbe-169b-4e9a-9efa-559be38d06b8/sist-en-iso-11133-2014>

INTERNATIONAL  
STANDARD

ISO  
11133

First edition  
2014-05-15

---

---

**Microbiology of food, animal feed and  
water — Preparation, production,  
storage and performance testing of  
culture media**

*Microbiologie des aliments, des aliments pour animaux et de l'eau —  
Préparation, production, stockage et essais de performance des  
milieux de culture*

iTeh STANDARD PREVIEW  
(standards.iteh.ai)

[SIST EN ISO 11133:2014](https://standards.iteh.ai/catalog/standards/sist/db01afbe-169b-4e9a-9efa-559be38d06b8/sist-en-iso-11133-2014)

<https://standards.iteh.ai/catalog/standards/sist/db01afbe-169b-4e9a-9efa-559be38d06b8/sist-en-iso-11133-2014>



Reference number  
ISO 11133:2014(E)

© ISO 2014

## iTeh STANDARD PREVIEW (standards.iteh.ai)

SIST EN ISO 11133:2014

<https://standards.iteh.ai/catalog/standards/sist/db01afbe-169b-4e9a-9efa-559be38d06b8/sist-en-iso-11133-2014>



### **COPYRIGHT PROTECTED DOCUMENT**

© ISO 2014

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office  
Case postale 56 • CH-1211 Geneva 20  
Tel. + 41 22 749 01 11  
Fax + 41 22 749 09 47  
E-mail [copyright@iso.org](mailto:copyright@iso.org)  
Web [www.iso.org](http://www.iso.org)

Published in Switzerland



# Contents

Page

<b>Foreword</b> .....	<b>v</b>
<b>Introduction</b> .....	<b>vi</b>
<b>1 Scope</b> .....	<b>1</b>
<b>2 Normative references</b> .....	<b>1</b>
<b>3 Terms and definitions</b> .....	<b>2</b>
3.1 General terms and definitions.....	2
3.2 Terminology of performance testing.....	2
3.3 Terminology of culture media.....	3
3.4 Terminology for test microorganisms.....	6
<b>4 Quality assurance management</b> .....	<b>7</b>
4.1 Documentation.....	7
4.2 Storage.....	8
4.3 Laboratory preparation of media.....	8
4.4 Storage and shelf-life of prepared media.....	11
4.5 Preparation for use.....	12
4.6 Incubation of solid media in Petri dishes.....	14
4.7 Disposal of media.....	14
<b>5 Test organisms for performance testing</b> .....	<b>14</b>
5.1 General.....	14
5.2 Selection of test organisms.....	14
5.3 Preservation and maintenance of test organisms.....	15
5.4 Microorganisms for performance testing.....	16
<b>6 Quality control and performance testing of culture media</b> .....	<b>19</b>
6.1 General requirements.....	19
6.2 Physical and chemical quality control.....	19
6.3 Microbiological quality control.....	19
6.4 General requirements for microbiological performance testing.....	20
6.5 Performance evaluation and interpretation of results.....	21
6.6 Confirmation media and reagents.....	22
<b>7 Methods for performance testing of solid culture media</b> .....	<b>22</b>
7.1 General.....	22
7.2 Methods for quantitative tests.....	22
7.3 Testing of culture media used for membrane filtration.....	24
7.4 Methods for qualitative tests.....	24
<b>8 Methods for performance testing of liquid culture media</b> .....	<b>25</b>
8.1 General.....	25
8.2 Quantitative tube method for performance testing of liquid enrichment media (dilution to extinction method).....	25
8.3 Qualitative tube method for performance testing of selective liquid media.....	26
8.4 Qualitative single tube method (turbidity) for performance testing of liquid media.....	27
<b>9 Methods for performance testing of diluents and transport media</b> .....	<b>28</b>
9.1 General.....	28
9.2 Method for testing diluents.....	28
9.3 Method for testing transport media.....	29
<b>10 Documentation of test results</b> .....	<b>30</b>
10.1 Information provided by the manufacturer.....	30
10.2 Traceability.....	30
<b>Annex A (informative) Designation of the components of culture media in International Standards on microbiological analysis of food, animal feed and water</b> .....	<b>31</b>

## ISO 11133:2014(E)

<b>Annex B</b> (normative) <b>Preparation of reference stock and working culture</b> .....	<b>33</b>
<b>Annex C</b> (normative) <b>Flow charts of methods for performance testing</b> .....	<b>38</b>
<b>Annex D</b> (informative) <b>Example of card for recording test results of culture media</b> .....	<b>42</b>
<b>Annex E</b> (normative) <b>Test microorganisms and performance criteria for culture media commonly used in food microbiology</b> .....	<b>44</b>
<b>Annex F</b> (normative) <b>Test microorganisms and performance criteria for culture media commonly used in water microbiology</b> .....	<b>62</b>
<b>Annex G</b> (normative) <b>Use of control charts to monitor quantitative testing of solid culture media</b> .....	<b>73</b>
<b>Annex H</b> (informative) <b>Quality assurance of culture media — Troubleshooting</b> .....	<b>80</b>
<b>Annex I</b> (informative) <b>Quantitative testing of liquid media</b> .....	<b>82</b>
<b>Annex J</b> (normative) <b>Definition of microbiological performance tests for standardized culture media</b> .....	<b>86</b>
<b>Bibliography</b> .....	<b>90</b>

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

SIST EN ISO 11133:2014

<https://standards.iteh.ai/catalog/standards/sist/db01afbe-169b-4e9a-9efa-559be38d06b8/sist-en-iso-11133-2014>

## 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. [www.iso.org/directives](http://www.iso.org/directives)

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received. [www.iso.org/patents](http://www.iso.org/patents)

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 34, *Food products*, Subcommittee SC 9, *Food products*, in collaboration with Technical Committee ISO/TC 147 *Water quality*, Subcommittee SC 4, *Microbiological methods*.

This first edition of ISO 11133 replaces the second edition of ISO/TS 11133-1 (ISO/TS 11133-1:2009) and the first edition of ISO/TS 11133-2:2003, which have been technically revised. It also incorporates the Amendment ISO/TS 11133-2:2003/Amd.1:2011. In particular, it also includes requirements for microbiology media for water testing. It supersedes ISO 9998:1991.

**ISO 11133:2014(E)****Introduction**

In laboratories carrying out microbiological examinations, the main objectives are to maintain, resuscitate, grow, detect and/or enumerate a wide variety of microorganisms. Culture media are used in all traditional microbiological culture techniques and also for many alternative techniques. Many formulae of culture media are commercially available and many more, designed for specific growth purposes, are described in the literature.

Many tests and procedures depend upon culture media being capable of providing consistent and reproducible results. The requirements for media may be specific to both the sample and the organisms to be detected. Culture media meeting established performance criteria are therefore a pre-requisite for any reliable microbiological work. Sufficient testing should be carried out to demonstrate

- a) the acceptability of each batch of medium,
- b) that the medium is “fit for purpose”, and
- c) that the medium can produce consistent results.

These three criteria are an essential part of internal quality control procedures and, with appropriate documentation, will permit effective monitoring of culture media and contribute to the production of both accurate and reliable data. For reliable microbiological analysis it is essential to use culture media of proven quality. For all media described in standard methods it is essential to define the minimum acceptance criteria required to ensure their reliability. It is recommended that in the determination of the performance characteristics of a culture medium, tests are carried out that conform with this International Standard.

The establishment of widely accepted minimum performance criteria for media should lead to products with more consistent quality and thus reduce the extent of testing necessary in the user's laboratory.

In addition the acceptance criteria measured by the methods defined in this International Standard can be used by all microbiological laboratories to evaluate the productive, selective and/or elective properties of a culture medium.

In the microbiological analysis of food, animal feed and water, the requirements of this International Standard have precedence in the assessment of culture media quality.

# Microbiology of food, animal feed and water — Preparation, production, storage and performance testing of culture media

## 1 Scope

This International Standard defines terms related to quality assurance of culture media and specifies the requirements for the preparation of culture media intended for the microbiological analysis of food, animal feed, and samples from the food or feed production environment as well as all kinds of water intended for consumption or used in food production.

These requirements are applicable to all categories of culture media prepared for use in laboratories performing microbiological analyses.

This International Standard also sets criteria and describes methods for the performance testing of culture media. This International Standard applies to producers such as:

- commercial bodies producing and/or distributing ready-to-use or semi-finished reconstituted or dehydrated media;
- non-commercial bodies supplying media to third parties;
- microbiological laboratories preparing culture media for their own use.

## 2 Normative references

SIST EN ISO 11133:2014

[https://standards.iteh.ai/catalog/standards/sist/db01afbe-169b-4e9a-9efa-](https://standards.iteh.ai/catalog/standards/sist/db01afbe-169b-4e9a-9efa-559be38d06b8/sist-en-iso-11133-2014)

[559be38d06b8/sist-en-iso-11133-2014](https://standards.iteh.ai/catalog/standards/sist/db01afbe-169b-4e9a-9efa-559be38d06b8/sist-en-iso-11133-2014)

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.

ISO 6887-1, *Microbiology of food and animal feed — Preparation of test samples, initial suspension and decimal dilutions for microbiological examination — Part 1: General rules for the preparation of the initial suspension and decimal dilutions*

ISO 6887-2, *Microbiology of food and animal feed — Preparation of test samples, initial suspension and decimal dilutions for microbiological examination — Part 2: Specific rules for the preparation of meat and meat products*

ISO 6887-3, *Microbiology of food and animal feed — Preparation of test samples, initial suspension and decimal dilutions for microbiological examination — Part 3: Specific rules for the preparation of fish and fishery products*

ISO 6887-4, *Microbiology of food and animal feed — Preparation of test samples, initial suspension and decimal dilutions for microbiological examination — Part 4: Specific rules for the preparation of miscellaneous products*

ISO 6887-5, *Microbiology of food and animal feeding stuffs — Preparation of test samples, initial suspension and decimal dilutions for microbiological examination — Part 5: Specific rules for the preparation of milk and milk products*

ISO 6887-6, *Microbiology of food and animal feed — Preparation of test samples, initial suspension and decimal dilutions for microbiological examination — Part 6: Specific rules for the preparation of samples taken at the primary production stage*

ISO 7704, *Water quality — Evaluation of membrane filters used for microbiological analyses*

**ISO 11133:2014(E)**

ISO 7218, *Microbiology of food and animal feeding stuffs — General requirements and guidance for microbiological examinations*

ISO 8199, *Water quality — General guidance on the enumeration of micro-organisms by culture*

**3 Terms and definitions**

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

NOTE 1 This clause gives the general definitions relating to quality assurance of culture media and provides terminology relating to performance testing, culture media and test microorganisms.

NOTE 2 Tables E.2 and F.2 give explanations of media name abbreviated terms.

**3.1 General terms and definitions****3.1.1****quality control**

part of quality management focused on fulfilling quality requirements

Note 1 to entry: See Reference [1].

**3.1.2****batch of culture medium****lot of culture medium**

homogeneous and fully traceable unit of a medium referring to a defined amount of bulk, semi-finished product or end product, which is consistent in type and quality and which has been produced within one defined production period, having been assigned the same batch (or lot) number

**3.1.3****chromogenic substrate****fluorogenic substrate**

substrate containing a chromophore/fluorophore group and a substrate utilizable by bacteria or fungi

Note 1 to entry: After splitting the chromogenic/fluorogenic substrate, the chromophore/fluorophore is released and a coloured/fluorescent end product becomes visible/can be detected using an ultraviolet (UV) lamp.

**3.2 Terminology of performance testing****3.2.1****performance of culture medium**

response of a culture medium to challenge by test organisms under defined conditions

**3.2.2****target microorganism**

microorganism or group of microorganisms to be detected or enumerated

**3.2.3****non-target microorganism**

microorganism that is suppressed by the medium and/or conditions of incubation or does not show expected characteristics of the target microorganism

**3.2.4****productivity of culture medium**

level of recovery of a target microorganism from the culture medium under defined conditions

**3.2.5****selectivity of culture medium**

degree of inhibition of a non-target microorganism on or in a selective culture medium under defined conditions

**3.2.6****selectivity of culture medium****specificity of culture medium**

demonstration, under defined conditions, that non-target microorganisms do not show the same visual characteristics as target microorganisms

**3.3 Terminology of culture media****3.3.1****culture medium**

formulation of substances, in liquid, semi-solid or solid form, which contain natural and/or synthetic constituents intended to support the multiplication, (with or without inhibition of certain microorganisms), identification or preservation of viability of microorganisms

Note 1 to entry: When used in connection with compound words, this term is often shortened to read “medium” (e.g. enrichment medium).

**3.3.2 Culture media classified by composition****3.3.2.1****chemically defined medium**

culture medium consisting only of chemically defined constituents of known molecular structure and degree of purity

**3.3.2.2****chemically undefined or partially undefined medium**

culture medium consisting entirely or partly of natural materials, processed or otherwise, the chemical composition of which is not completely defined

Note 1 to entry: Harmonized designations for various chemically undefined components used in culture media are specified in [Annex A](#).

**3.3.2.3****chromogenic culture medium****fluorogenic culture medium**

culture medium containing one or more chromogenic/fluorogenic substrates

Note 1 to entry: Chromogenic culture media facilitate the identification of bacteria or fungi by means of defined colour and morphological characteristics (culture medium typical growth). Fluorogenic media require visualization using a UV lamp. The biochemical reaction products, which are necessary for the efficiency of chromogenic/fluorogenic culture media, are normally the result of the enzymatic activity of certain organisms, which in turn depends greatly on the precise maintenance of specific conditions (e.g. temperature, pH value, concentrations of substrate).

**3.3.3 Culture media classified by physical consistency****3.3.3.1****liquid medium**

culture medium consisting of an aqueous solution of one or more constituents, such as peptone water and nutrient broth

Note 1 to entry: In some cases, solid particles are added to the liquid culture medium, such as cooked meat medium.

Note 2 to entry: Liquid media in tubes, flasks or bottles are commonly called “broths”.

**3.3.3.2****solid medium****semi-solid medium**

liquid medium containing solidifying substances (e.g. agar-agar, gelatin) in different concentrations

Note 1 to entry: Due to the worldwide use of media solidified with agar-agar, the shortened term “agar” is often used synonymously for solid media and therefore in connection with nouns, e.g. “Plate Count agar”.