

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN ISO 15788-1:2001](#)

<https://standards.iteh.ai/catalog/standards/sist/3ab58135-c7a7-4054-80c9-b5257494d6f5/sist-en-iso-15788-1-2001>

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN ISO 15788-1

June 2001

ICS 67.200.10

English version

Animal and vegetable fats and oils - Determination of
stigmastadienes in vegetable oils - Part 1: Method using
capillary-column gas chromatography (Reference method) (ISO
15788-1:1999)

Corps gras d'origines animale et végétale - Dosage des
stigmastadiènes dans les huiles végétales - Partie 1:
Méthode par chromatographie en phase gazeuse sur
colonne capillaire (Méthode de référence) (ISO 15788-
1:1999)

Tierische und pflanzliche Fette und Öle - Bestimmung der
Stigmastadiene in Pflanzenölen - Teil 1: Verfahren mit
Kapillarsäulen-Gaschromatographie (Referenzverfahren)
(ISO 15788-1:1999)

This European Standard was approved by CEN on 13 May 2001.

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 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 Management Centre has the same status as the official versions.

<https://standards.iteh.ai/catalog/standards/sist/3ab58135-c7a7-4054-80c9-15788-1/15788-1:2001>

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.



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

Management Centre: rue de Stassart, 36 B-1050 Brussels

Foreword

The text of the International Standard from Technical Committee ISO/TC 34 "Agricultural food products" of the International Organization for Standardization (ISO) has been taken over as an European Standard by Technical Committee CEN/TC 307 "Oilseeds, vegetable and animal fats and oils and their by-products - Methods of sampling and analysis", the secretariat of which is held by AFNOR.

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 2001, and conflicting national standards shall be withdrawn at the latest by December 2001.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

iTeh STANDARD PREVIEW
(standards.iteh.ai)
Endorsement notice

The text of the International Standard ISO 15788-1:1999 has been approved by CEN as a European Standard without any modification.

<http://standards.iteh.ai/catalog/standards/sist/3ab58135-c7a7-4054-80c9-b5257494d6f5/sist-en-iso-15788-1-2001>

INTERNATIONAL
STANDARD

ISO
15788-1

First edition
1999-10-15

**Animal and vegetable fats and oils —
Determination of stigmastadienes in
vegetable oils —**

Part 1:

Method using capillary-column gas
chromatography (Reference method)

iTeh STANDARD YK REVIEW
(standards.iteh.ai)

*Corps gras d'origines animale et végétale — Dosage des stigmastadiènes
dans les huiles végétales —*

*Partie 1: Méthode par chromatographie en phase gazeuse sur colonne
capillaire (Méthode de référence)*

SIST EN ISO 15788-1:2001

<https://standards.iteh.ai/catalog/standards/sist/3a223135-37a7-4054-80e9-b5257494d6b5/sist-en-iso-15788-1-2001>



Reference number
ISO 15788-1:1999(E)

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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 15788-1 was prepared by Technical Committee ISO/TC 34, *Agricultural food products*, Subcommittee SC 11, *Animal and vegetable fats and oils*.

ISO 15788 consists of the following parts, under the general title *Animal and vegetable fats and oils — Determination of stigmastadienes in vegetable oils*:

— Part 1: Method using capillary-column gas chromatography

— Part 2: Method using high-performance liquid chromatography

Annex A of this part of ISO 15788 is for information only.

[SIST EN ISO 15788-1:2001](https://standards.iteh.ai/catalog/standards/sist/3ab58135-c7a7-4054-80c9-b5257494d6f5/sist-en-iso-15788-1-2001)

<https://standards.iteh.ai/catalog/standards/sist/3ab58135-c7a7-4054-80c9-b5257494d6f5/sist-en-iso-15788-1-2001>

© ISO 1999

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from the publisher.

International Organization for Standardization
Case postale 56 • CH-1211 Genève 20 • Switzerland
Internet iso@iso.ch

Printed in Switzerland

Introduction

Significant amounts of hydrocarbons are formed in vegetable oils as a consequence of thermal treatments during the refining processes [1]. Among these hydrocarbons, 3,5-stigmastadiene, a steroidal compound, is the most abundant in all refined vegetable oils since it is derived from β -sitosterol by dehydration [2]. The 3,5-stigmastadiene is produced together with minor amounts of the 2,4-isomer and both substances give a single well-defined gas-chromatographic peak when the hydrocarbon fraction is analysed on a low polar column [3]. Therefore, the sum of both isomers can be easily quantified by gas-chromatographic analysis of the steroidal hydrocarbon fraction [2], [4].

For instance, for virgin olive oils, the usual oil production processes (pressure or centrifuging) do not produce measurable amounts of stigmastadienes (less than 0,01 mg/kg). In crude olive residue oil, small concentrations of stigmastadienes are found (ranging between 0,2 mg/kg and 3 mg/kg) due to the high temperatures applied during the drying of the raw olive residue.

In the refining processes, stigmastadienes are formed in all the steps involving high temperatures, such as bleaching and deodorizing, but more amounts are formed in the first step using acid bleaching earth than in the second [2]. Depending on the conditions applied during the refining process, commercial refined vegetable oils show stigmastadiene concentrations ranging between 1 mg/kg and 120 mg/kg and, therefore, the assessment of stigmastadienes allows not only the identification of thermally treated oils but also the detection of minor amounts of refined vegetable oils in virgin oils.

A method for the determination of stigmastadienes and the results of a collaborative study carried out under the auspices of the International Olive Oil Council were presented to the International Union of Pure and Applied Chemistry (IUPAC) Commission on Oils, Fats and Derivatives. The stigmastadiene content has been adopted as an identity criterion for virgin olive oils and the resulting analytical method has been adopted as an international standard method.

[SIST EN ISO 15788-1:2001](https://standards.iteh.ai/catalog/standards/sist/3ab58135-c7a7-4054-80c9-b5257494d6f5/sist-en-iso-15788-1-2001)

<https://standards.iteh.ai/catalog/standards/sist/3ab58135-c7a7-4054-80c9-b5257494d6f5/sist-en-iso-15788-1-2001>

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN ISO 15788-1:2001](#)

<https://standards.iteh.ai/catalog/standards/sist/3ab58135-c7a7-4054-80c9-b5257494d6f5/sist-en-iso-15788-1-2001>

Animal and vegetable fats and oils — Determination of stigmastadienes in vegetable oils —

Part 1:

Method using capillary-column gas chromatography (Reference method)

1 Scope

This part of ISO 15788 specifies a method for the determination of stigmastadienes in virgin vegetable oils containing low concentrations of these hydrocarbons, particularly in virgin olive oil.

This method is applicable to all vegetable oils although measurements are reliable only where the content of these hydrocarbons lies between 0,01 mg/kg and 4,0 mg/kg. The method is suited to detecting the presence of refined vegetable oils (olive, olive pomace, sunflower, palm, etc.) in virgin olive oils, since refined oils contain stigmastadienes and cold-extracted oils do not.

(standards.iteh.ai)

2 Principle

SIST EN ISO 15788-1:2001

<https://standards.iteh.ai/catalog/standards/sist/3ab58135-c7a7-4054-80c9-05257494067/sist-en-iso-15788-1-2001>

Unsaponifiable matter is isolated. The steroidal hydrocarbon fraction is separated by column chromatography on silica gel and analysed by capillary gas chromatography.

3 Reagents

Use only reagents of recognized analytical grade, unless otherwise specified, and distilled or demineralized water or water of equivalent purity.

3.1 Hexane, or mixture of alkanes of boiling point from 65 °C to 70 °C, distilled with a rectifying column.

The hexane shall be redistilled to remove impurities.

3.2 Ethanol, 96 % (volume fraction).

3.3 Anhydrous sodium sulfate.

3.4 Alcoholic potassium hydroxide solution, of concentration 50 g per 500 ml.

Add 10 ml of water to 50 g potassium hydroxide, stir, and then dilute the mixture with ethanol to 500 ml.

Alcoholic potassium hydroxide solution turns brown on standing. It should be prepared freshly each day and kept in well-stoppered dark glass bottles.