

INTERNATIONAL STANDARD

**ISO
6799**

Second edition
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Animal and vegetable fats and oils — Determination of composition of the sterol fraction — Method using gas chromatography

*Corps gras d'origines animale et végétale — Détermination de la
composition de la fraction stérolique — Méthode par chromatographie
en phase gazeuse*



Reference number
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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.

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 6799 was prepared by Technical Committee ISO/TC 34, *Agricultural food products*, Sub-Committee SC 11, *Animal and vegetable fats and oils*.

This second edition cancels and replaces the first edition (ISO 6799:1983), of which it constitutes a technical revision.

Annex A of this International Standard is for information only.

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Introduction

Sterols are characteristic constituents of fats whether these are liquid or solid at ambient temperature. Animal fats always contain cholesterol, whereas vegetable fats contain a mixture of sterols, for example stigmasterol and β -sitosterol, called phytosterols. Meanwhile, some vegetable fats, e.g. colza, maize and palm, contain a small percentage of cholesterol in the total sterols.

The results of the method specified in this International Standard can be used for checking the purity of a fat, for checking conformity of a fat with a sales description or advertised composition, or for checking a fat for nutritional purposes.

For detecting the presence of animal fats in vegetable fats, the small quantities of cholesterol, which may be present in vegetable fats, need to be taken into account. In this case, it is necessary to carry out other methods of analysis in addition to the identification of sterols, for example the determination of the composition of fatty acids by gas chromatography (see ISO 5508 and ISO 5509). In practice, branched fatty acids and fatty acids with an odd number of carbon atoms are only present in appreciable quantities in animal fats.

Animal and vegetable fats and oils — Determination of composition of the sterol fraction — Method using gas chromatography

1 Scope

This International Standard specifies a gas chromatographic method using packed or capillary columns for the determination of the composition of the sterol fraction of animal and vegetable fats and oils.

Des-sterols are determined but substituted sterols (i.e. methyl and dimethyl) may interfere and care is needed in interpreting the results.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 661:1989, *Animal and vegetable fats and oils — Preparation of test sample*.

ISO 3596-1:1988, *Animal and vegetable fats and oils — Determination of unsaponifiable matter — Part 1: Method using diethyl ether extraction (Reference method)*.

ISO 3596-2:1988, *Animal and vegetable fats and oils — Determination of unsaponifiable matter — Part 2: Rapid method using hexane extraction*.

ISO 3696:1987, *Water for analytical laboratory use — Specification and test methods*.

ISO 5508:1990, *Animal and vegetable fats and oils — Analysis by gas chromatography of methyl esters of fatty acids*.

3 Principle

Saponification of a test portion, extraction of the unsaponifiable matter and separation of sterols in the unsaponifiable matter by thin-layer chromatography. Analysis of the separated sterols, or of prepared derivatives, by gas chromatography using packed or capillary columns.

4 Reagents

Hazardous compounds are marked with an asterisk.

Use only reagents of recognized analytical grade, unless otherwise stated, and water complying with grade 3 of ISO 3696.

4.1 Reagents for the preparation of unsaponifiable matter

See ISO 3596-1 or ISO 3596-2.

4.2 Reagents for the separation of sterols

4.2.1 Ethanol, 95 % (V/V).

4.2.2 Light petroleum, distilling in the range 30 °C to 60 °C.

4.2.3 Acetone

4.2.4 Developing solvent, such as chloroform* or hexane/ethyl acetate [80 + 20 (V/V)] mixture or toluene*/acetone [95 + 5 (V/V)] mixture.

4.2.5 Ethyl acetate or diethyl ether, free from peroxides and residues.

4.2.6 Silica powder with binder, thin-layer chro-