

Animal and vegetable fats and oils — Determination of polycyclic aromatic hydrocarbons — Exclusion of olive pomace oil from the scope

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National foreword

This British Standard is the UK implementation of EN ISO 15753:2006+A1:2011. It is identical to ISO 15753:2006, incorporating amendment 1:2011. It supersedes BS EN ISO 15753:2006, which is withdrawn.

The start and finish of text introduced or altered by amendment is indicated in the text by tags. Tags indicating changes to ISO text carry the number of the ISO amendment. For example, text altered by ISO amendment 1 is indicated by **A1** **A1**.

The UK participation in its preparation was entrusted to Technical Committee AW/307, Oil seeds, animal and vegetable fats and oils and their by-products.

A list of organizations represented on AW/307 can be obtained on request to its secretary.

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Corps gras d'origines animale et végétale - Détermination des hydrocarbures aromatiques polycycliques (ISO 15753:2006)

Tierische und pflanzliche Fette und Öle - Bestimmung von polycyclischen aromatischen Kohlenwasserstoffen (ISO 15753:2006)

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Foreword

This document (EN ISO 15753:2006) has been prepared by Technical Committee ISO/TC 34 "Agricultural food products" in collaboration with 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of an identical text or by endorsement, at the latest by March 2007, and conflicting national standards shall be withdrawn at the latest by March 2007.

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The text of ISO 15753:2006 has been approved by CEN as EN ISO 15753:2006 without any modifications.

Foreword to amendment A1

This document (EN ISO 15753:2006/A1:2011) has been prepared by Technical Committee ISO/TC 34 "Food products" in collaboration with 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 Amendment to the European Standard EN ISO 15753:2006 shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by February 2012, and conflicting national standards shall be withdrawn at the latest by February 2012.

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Endorsement notice

The text of ISO 15753:2006/Amd 1:2011 has been approved by CEN as a EN ISO 15753:2006/A1:2011 without any modification.

INTERNATIONAL STANDARD

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Animal and vegetable fats and oils — Determination of polycyclic aromatic hydrocarbons

*Corps gras d'origines animale et végétale — Détermination des
hydrocarbures aromatiques polycycliques*



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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.

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ISO 15753 was prepared by Technical Committee ISO/TC 34, *Food products*, Subcommittee SC 11, *Animal and vegetable fats and oils*.

Animal and vegetable fats and oils — Determination of polycyclic aromatic hydrocarbons

1 Scope

This International Standard describes two methods for the determination of 15 polycyclic aromatic hydrocarbons (PAHs) in animal and vegetable fats and oils:

- a general method, and
- a method specific for coconut oil and vegetable oils with short-chain fatty acids.

These methods are not quantitative for the very volatile compounds such as naphthalene, acenaphthene and fluorene. Due to interferences provided by the matrix itself, palm oil and olive pomace oil cannot be analysed using this method.

NOTE The results for olive pomace oil in Annex B show that this method is not applicable to this type of oil. The precision data determined are very poor.

The quantification limit is 0,2 µg/kg for almost all compounds analysed, except for fluoranthene and benzo(*g,h,i*)perylene where the quantification limit is 0,3 µg/kg, and indeno(1,2,3-*c,d*)pyrene where the quantification limit is 1 µg/kg.

2 Normative references

The following referenced documents are indispensable for the application 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 661, *Animal and vegetable fats and oils — Preparation of test sample*

3 Terms and definitions

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

3.1

polycyclic aromatic hydrocarbon

PAH

compound that contains two or more condensed (fused) aromatic hydrocarbon rings and the content of which can be determined according to the method specified in this International Standard

NOTE 1 The content is given in micrograms per kilogram.

NOTE 2 In general PAHs are divided into light PAHs with two to four aromatic rings, and heavy PAHs with five or more aromatic rings.

EXAMPLES

Light PAHs include:

naphthalene (CAS RN [91-20-3]), acenaphthene (CAS RN [83-32-9]), acenaphthylene (CAS RN [208-96-8]), fluorene (CAS RN [86-73-7]), anthracene (CAS RN [120-12-7]), phenanthrene (CAS RN [85-01-8]), fluoranthene (CAS RN [206-44-0]), chrysene (CAS RN [218-01-9]), benz(*a*)anthracene (CAS RN [56-55-3]), pyrene (CAS RN [129-00-0]).

Heavy PAHs include:

benzo(a)pyrene (CAS RN [50-32-8]), benzo(b)fluoranthene (CAS RN [205-99-2]), benzo(k)fluoranthene (CAS RN [207-08-9]), benzo(g,h,i)perylene (CAS RN [191-24-2]), dibenz(a,h)anthracene (CAS RN [53-70-3]), indeno(1,2,3-c,d)pyrene (CAS RN [193-39-5]).

4 Principle

The polycyclic aromatic hydrocarbons are extracted with an acetonitrile/acetone mixture followed by purification on C18 reversed-phase and then Florisil bonded-phase cartridges. Determination of the content of the individual polycyclic aromatic hydrocarbons after separation is achieved by means of high-pressure liquid chromatography (HPLC) and by measuring the fluorescence at various excitation and emission wavelengths.

5 Reagents and materials

WARNING — Attention is drawn to the regulations governing the handling of dangerous matter. Technical, organizational and personal safety measures must be followed.

Use only reagents of recognized analytical grade unless otherwise stated.

Check the quality of solvents before use by concentrating the solvent about 1 000 times by evaporation and analysing the concentrate by HPLC (300 ml to 300 µl). The chromatogram shall be free from peaks in the elution area of PAHs.

- 5.1 Methanol**, 'ultra resi-analysed' grade¹⁾.
- 5.2 Hexane**, HPLC grade¹⁾.
- 5.3 Acetonitrile**, HPLC grade¹⁾.
- 5.4 Acetone**, HPLC grade¹⁾.
- 5.5 Dichloromethane**, HPLC grade¹⁾.
- 5.6 Toluene**, HPLC grade¹⁾.
- 5.7 Water**, HPLC grade¹⁾.
- 5.8 Tetrahydrofuran**, HPLC grade¹⁾.
- 5.9 Solvent mixture 1**: acetonitrile/acetone (volume fraction 60 % / 40 %).

Quantity used per sample: 41 ml for general method, 36 ml for method specific for coconut oil.

- 5.10 Solvent mixture 2**: acetonitrile/acetone (volume fraction 80 % / 20 %).

Quantity used per sample: 2 × 11 ml for method specific for coconut oil.

- 5.11 Solvent mixture 3**: hexane/dichloromethane (volume fraction 75 % / 25 %).

Quantity used per sample: 7 ml for general method, 2 × 7 ml for method specific for coconut oil.

1) These can be obtained from, for example, Baker.

This information is given for the convenience of users of this International Standard and does not constitute an endorsement by ISO of these products. Equivalent products may be used if they can be shown to lead to the same results.