

Animal and vegetable fats and oils — Sampling

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British Standard

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- AFRC Institute of Food Research
- Association of Public Analysts
- British Food Manufacturing Industries Research Association
- Department of Trade and Industry (Laboratory of the Government Chemist)
- FOSFA International
- Institute of Biology
- International Association of Seed Crushers
- International Federation of Inspection Agencies
- Margarine and Shortening Manufacturers' Association
- Ministry of Agriculture, Fisheries and Food
- Natural Resources Institute
- Royal Society of Chemistry
- Seed Crushers' and Oil Processors' Association
- Soap and Detergent Industry Association
- Society of Chemical Industry
- Tropical Growers' Association
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National foreword

This British Standard has been prepared under the direction of the Agriculture and Food Standards Policy Committee. It is identical with ISO 5555:1991 “*Animal and vegetable fats and oils — Sampling*” published by the International Organization for Standardization (ISO), in the preparation of which the United Kingdom played an active part. This British Standard supersedes BS 627:1982 which is withdrawn and from which it differs in that requirements for sampling in various circumstances are more explicit and the examples of sampling apparatus have been changed.

In 1995 the European Committee for Standardization (CEN) accepted ISO 5555:1991 as European Standard EN ISO 5555:1995. As a consequence of implementing the European Standard this British Standard is renumbered as BS EN ISO 5555:1995 and any reference to BS 627 should be read as a reference to BS EN ISO 5555.

Cross-references

International Standard	Corresponding British Standard
ISO 707:1985	BS 809:1985 <i>Methods for sampling of milk and milk products</i> (Identical)

The Technical Committee has reviewed the provisions of ISO 2859-2 and ISO 3951, to which reference is made in the text for information only, and decided that they are acceptable for use in conjunction with this standard. A related British Standard to ISO 2859-2 is BS 6001 “*Sampling procedures for inspection by attributes*”, Part 2:1984 “*Specification for sampling plans indexed by limiting quality (LQ) for isolated lot inspection*”. A related British Standard to ISO 3951 is BS 6002:1979 “*Specification for sampling procedures and charts for inspection by variables for percent defective*”.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, the EN ISO title page, pages 2 to 22, an inside back cover and a back cover. This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

English version

Animal and vegetable fats and oils — Sampling

(ISO 5555:1991)

Corps gras d'origines animale et végétale —
Echantillonnage
(ISO 5555:1991)

Tierische und pflanzliche Fette und Öle —
Probenahme
(ISO 5555:1991)

This European Standard was approved by CEN on 1995-01-05. 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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

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CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

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Foreword

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

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 October 1995, and conflicting national standards shall be withdrawn at the latest by October 1995.

In accordance with the CEN/CENELEC Internal Regulations, the following countries are bound to implement this European Standard: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom.

1 Scope

This International Standard describes methods of sampling crude or processed animal and vegetable fats and oils, referred to as fats hereafter whatever the origin and whether liquid or solid. It also describes the apparatus used for this process.

NOTE 1 Methods of sampling milk and milk products, including milk fats, are specified in ISO 707.

2 Definitions

For the purposes of this International Standard, the following definitions apply.

2.1 consignment

the quantity of fat delivered at one time and covered by a particular contract or shipping document. It may be composed of one or more lots or parts of lots

2.2 lot

an identified quantity of fat, presumed to be of uniform characteristics

2.3 increment

a quantity of fat taken at one time from one place in a lot

2.4 bulk sample

the quantity of fat obtained by combining the various increments from a lot in amounts proportional to the quantities they represent

NOTE 2 The bulk sample should be representative of the lot and take account of any contractual requirements.

2.5 laboratory sample

the quantity of fat, obtained from the bulk sample after suitable homogenization and reduction in size, which is representative of the lot and intended for laboratory examination

2.6 conventional mass per volume sample; “litre weight in air” sample

the quantity of fat taken for the mass of fat to be calculated from the volume

3 General

The object of sampling and of preparing samples is to obtain from a consignment (which may be in lots) a manageable quantity of the fat, the properties of which correspond as closely as possible to the properties of the consignment sampled.

The methods of taking samples described below are intended for the guidance of experts and can be used for

- a) consignments in bulk, e.g. in land tanks, ships' tanks, tank wagons and tank cars; and
- b) consignments consisting of a number of packages, e.g. barrels, drums, cases, tins, bags and bottles.

4 Apparatus

4.1 General

For a particular purpose, the choice of sampling instruments and their suitability depend on the skill of the sampler in following the recommended procedures.

In all circumstances, it shall be borne in mind whether the sample is intended for preliminary inspection, for analysis, or for the determination of conventional mass per volume (“litre weight in air”).

4.2 Materials

Sampling instruments, ancillary apparatus and sample containers (including caps) shall be made of materials which are chemically inert to the fat being sampled and they shall not catalyse chemical reactions.

For sampling instruments, stainless steel is the most suitable material. Aluminium may be used only when the acidity is low but not for the storage of samples.

Plastics, copper and copper alloys shall not be used nor any toxic material.

WARNING — If glass apparatus is used for a particular reason, great care shall be taken to avoid breakages.

4.3 Examples of types of sampling instruments

4.3.1 General

Many forms and types of sampling instruments exist, and the instruments described in this International Standard are only examples of those commonly used.

The instruments are all simple, robust and easily cleaned. They can be used for all the sampling operations described in this International Standard with all types of fats commonly found in commerce.

Certain basic requirements are common to all sampling instruments; e.g. they shall be capable of taking a representative sample from a required level or area and of preserving the integrity of the sample until it can be transferred to a sample container. Ease of cleaning, practical size and ability to withstand rough usage are other essential characteristics.

Alternative designs of instruments to those described in this International Standard may be used, e.g. to meet the needs of individual users.

The instruments can be of various sizes according to the quantity of sample required and the accessibility of the fat.

The types of apparatus mentioned in 4.3.2, 4.4.1, 4.4.2 and 4.4.5 are described in Annex B.

4.3.2 Sampling instruments

4.3.2.1 *Simple weighted sample can*, see B.1 and Figure B.1.

4.3.2.2 *Weighted cage for sample bottle*, see B.2 and Figure B.2.

4.3.2.3 *Valve sampling cylinder (sinker sampler)*, see B.3 and Figure B.3.

4.3.2.4 *Bottom samplers*, see B.4 and Figure B.4.

4.3.2.5 *Sampling tubes*, see B.5 and Figure B.5.

4.3.2.6 *Sampling scoops*, see B.6 and Figure B.6.

4.4 Ancillary apparatus

4.4.1 *Water-finding rule*, see B.7 and Figure B.7.

4.4.2 *Ullage rule*, see B.8 and Figure B.8.

4.4.3 *Labels*, adhesive or tie-on and *sealing apparatus*, see also clause 7.

4.4.4 *Thermometers*

4.4.5 *Measuring tape and weight*, see B.9.

4.5 Sample containers

4.5.1 *Sample containers*, made of the materials specified in 4.2.

NOTE 3 Glass containers are recommended.

5 Sampling technique

5.1 All sampling operations shall be performed by an operator with clean hands or wearing gloves (clean plastics or cotton gloves may be used).

5.2 The apparatus and sample containers shall be clean and dry prior to initial use. During the sampling of similar fats, the same sampling apparatus may be used provided that it is adequately flushed with the fat to be sampled to ensure that none of the previous sample remains.

5.3 Sampling shall be carried out in such a manner as to protect the samples, the fat being sampled, the sampling instruments and the sample containers from adventitious contamination with rain, dust, etc.

5.4 All extraneous material shall be removed from the outside of the sampling instruments before the instruments are emptied.

5.5 If heating is necessary to facilitate sampling, it is important that fats are not overheated. It is recommended, in accordance with usual practice, that the temperature of a bulk of fat in a storage tank should not be raised by more than 5 °C per day.

The area of heating coils should be large in relation to the volume of fat and their temperature kept as low as possible to avoid local overheating. Steam, at a maximum pressure of 150 kPa (1,5 bar) gauge reading (128 °C) or hot water (only if the heating coils are self-draining) should be used. Care is required to prevent contamination of the fat by steam or water.

The temperature of the fat during sampling should be within the range indicated in Annex A.

5.6 After samples have been taken as specified in 6.1 to 6.8, as appropriate, laboratory samples shall be prepared as specified in 6.9.

6 Methods of sampling

6.1 General

6.1.1 Containers for transport and storage of fats

A distinction is made between the following types of containers from which samples are taken and which may affect the method of sampling to be used:

- a) vertical cylindrical land tanks (see 6.2);
- b) ships' tanks (see 6.3);
- c) tank wagons or cars (see 6.4);
- d) horizontal cylindrical tanks (see 6.4);
- e) weigh tanks (see 6.5);
- f) pipelines during transfer (see 6.6);
- g) packages, e.g. barrels, drums, cases, tins, bags and bottles (see 6.8).

The procedure is also given for sampling for the determination of conventional mass per volume ("litre weight in air") (see 6.7).

6.1.2 Water

Water may be present as free water at the bottom (i.e. separated water), as an emulsion layer or as water in suspension in the fat in any of the containers described in 6.1.1, but during usual operations the fat is unlikely to remain static for sufficient time in weigh tanks and pipelines for the water to settle to the bottom.

Measurement of water is mostly conducted in vertical storage tanks (see 6.2), but the same principles apply to the containers listed other than pipelines.

The presence of water may be detected with a bottom sampler (B.4) and free water may be measured with a water-finding rule (B.7) and water-finding paste or paper, or by electronic means.

Whichever method is used, accurate determination of water content is often difficult because of the indistinct separation of free water and the emulsion layer and water in suspension, in the lower layers of the fat.

It may also be useful to determine whether the water is fresh or sea water.

6.2 Sampling from vertical cylindrical land tanks

6.2.1 Preliminary operations

6.2.1.1 Sediment, emulsion and free water

Determine whether there is sediment or an emulsion layer or free water at the bottom of the tank by means of a bottom sampler and/or water detectors as described in 6.1.2.

The careful application of heat followed by standing assists the water in suspension to settle out (see 5.5).

It is desirable, so far as possible, to run off free water before sampling, subject to contractual requirements and agreement of contract parties, and to measure the amount removed.

6.2.1.2 Homogenizing

Before sampling begins, it is essential that the whole of the product is as homogeneous and as nearly liquid as possible.

Check the fat in the tank for uniformity by examining increments taken from various levels using a simple weighted sample can (B.1), a weighted cage for sample bottle (B.2) or a valve sampling cylinder (B.3) and from the bottom using a bottom sampler (B.4).

If layers of different composition are present, homogeneity can, in most cases, be obtained by heating as described in 5.5.

If heating is not permissible because of the nature of the fat, or if it is not necessary, or if heating has to be avoided for any other reason, the fat can be made homogeneous by blowing nitrogen through it.

NOTE 4 If a fat is known to be inhomogeneous and nitrogen is not available, the parties may agree to blowing dry air through the product, although this process is to be deprecated especially in the case of marine oils, because it may cause deterioration of the fat by oxidation. Details of such operations should be included in the sampling report sent to the laboratory.

6.2.2 Procedure

6.2.2.1 General

Sample each tank separately.

6.2.2.2 Inhomogeneous fats

If the contents of the tank are not and cannot be made homogeneous, a simple weighted sample can (B.1), a weighted cage for sample bottle (B.2) or a valve sampling cylinder (B.3) is generally used for sampling, plus a bottom sampler (B.4).

Take increments at depths of every 300 mm, from top to bottom, until the layer of different composition is reached. In this layer, take more increments (for example at depths of every 100 mm). Also take a bottom sample.

Mix appropriate increments to give

- a sample of the clear oil;
- a sample of the separated layer.

Prepare a bulk sample by mixing samples a) and b) in proportion to the respective sizes of the two layers, taking care to ensure that the proportions are as exact as possible.

Prepare the number of bulk samples given in Table 1, preparing at least one bulk sample for each tank.

Table 1 — Number of bulk samples to be taken from each ship's tank or land tank

Mass of tank contents tonne	Number of bulk samples for each tank
≤ 500	1
> 500 ≤ 1 000	2
> 1 000	1 for every 500 t or part thereof

6.2.2.3 Homogeneous fats

If the contents of the tank are homogeneous, use one of the same sampling instruments as in 6.2.2.2, but in this case take at least three increments, "top", "middle" and "bottom".

NOTE 5 The "top" increment should be taken at a level of one-tenth of the total depth from the surface, the "middle" increment should be taken at a level of one-half of the total depth and the "bottom" increment should be taken at a level of nine-tenths of the total depth.

Prepare a bulk sample by mixing in the proportions one part from each of the top and bottom increments and three parts from the middle.

Prepare the number of bulk samples given in Table 1, preparing at least one bulk sample for each tank.