# SAMPLING METHODS

**OILS, FATS, TECHNICAL TALLOWS, GREASES AND ACID OILS**

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FOSFA INTERNATIONAL OFFICIAL METHOD
PACKAGING AND STORAGE OF OILS AND FATS SAMPLES

1 Scope

This FOSFA method for the labelling, packaging, transport and storage of samples is applicable to all samples drawn under the terms of FOSFA International contracts for analysis, arbitration or standards purposes.

2 Label design

2.1 Labels must comply with ISO 5555:2001/Amd 1:2014 Section 7.2.

2.2 Labels should be completed in legible handwriting, preferably in capital letters, or typed. Labels should be securely attached to the samples they represent.

3 Sample labelling, sealing and distribution

The label is to be affixed to the sample bottle and sealed to the bottle (jointly where appropriate) and to clearly indicate the appropriate FOSFA International contract number.

Sealing wax, if used, should not contain copper. If a sealing wax does contain copper or the composition is unknown, the sample container shall be placed in a tight-fitting plastic bag and labelled and sealed therein.

Samples shall be distributed in accordance with the relevant FOSFA International contract requirements.

4 Packaging of oils and fats samples for analysis

The samples shall be packed in accordance with ISO 5555:2001/Amd 1:2014. For contractual analysis a sample of 250 ml is sufficient. Where special analyses are needed, a sample of 500 ml or more will be required.

5 Storage of samples after analysis

Samples should be clearly marked and stored with an in-house reference number in cool, dry conditions, away from strong light. The sample area should be insect and rodent free and hygienic. In normal circumstances, it has been the experience that contractual samples should be stored for a minimum of three months and longer if circumstances so dictate.
# SAMPLING METHODS

## OLEAGINOUS SEEDS AND OLEAGINOUS SEED PRODUCTS

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FOSFA INTERNATIONAL OFFICIAL METHOD
OILSEEDS – SAMPLING

1 Scope
This FOSFA Method specifies methods of sampling oilseeds for the assessment of their quality and condition.

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 664, Oilseeds — Reduction of laboratory sample to test sample.

3 Terms and definitions
For the purposes of this FOSFA Method, the following definitions apply.

3.1 consignment
The quantity of oilseeds dispatched or received at one time and covered by a particular contract or shipping document. It may be composed of one or more lots or parts of a lot.

3.2 lot
A stated quantity of the consignment, which in itself is presumed to be of uniform characteristics, and which will allow the quality to be assessed.

3.3 increment
A small quantity of oilseeds taken at one time from a single position from a stationary lot, or taken throughout the moving lot.

A series of increments is taken from different parts of the stationary lot, or throughout the moving lot, so that when they are bulked, they are representative of the lot.

3.4 bulk sample
The quantity of oilseeds obtained by combining and blending the increments taken from a stationary lot or throughout a moving lot.

3.5 laboratory sample
3.5.1 Representative quantity of oilseeds obtained by division of the bulk sample and intended for analysis or other examination.

4 General
4.1 Samples shall be representative of the lots from which they are taken. For this purpose, each consignment shall be divided, actually or notionally, into lots as given in Table 1.

Increments from each lot shall be mixed to give a bulk sample of an appropriate quantity. Laboratory samples are obtained by the successive division and reduction of the bulk sample. A laboratory sample shall be produced for each lot.
4.2 Manual sampling equipment and mechanical samplers shall be clean, dry, free from foreign odours and made from material which will not contaminate the oilseeds.

Manual sampling shall be carried out and mechanical samplers shall operate in such manner as to protect samples. Sample containers shall be protected to prevent contamination of the samples.

4.3 All sampling operations shall be carried out over a sufficiently short period of time so as to avoid any alteration in the composition of the samples. If one of the sampling stages will require too long a period of time, the samples or intermediate samples shall be preserved in airtight containers.

Table 1 — Size of lots and number and size of samples for oilseeds consignments

<table>
<thead>
<tr>
<th>Nominal consignment size</th>
<th>t</th>
<th>0 - 5,000</th>
<th>&gt;5,000 - 10,000</th>
<th>&gt;10,000 - 25,000</th>
<th>&gt; 25,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lot size</td>
<td>t</td>
<td>500¹</td>
<td>1,000</td>
<td>2,500</td>
<td>5,000</td>
</tr>
<tr>
<td>No of increments per lot</td>
<td>#</td>
<td>Min 20</td>
<td>Min 30</td>
<td>Min 40</td>
<td>Min 50</td>
</tr>
<tr>
<td>Wt of increments</td>
<td>kg</td>
<td>Min 0.4</td>
<td>Min 0.4</td>
<td>Min 0.4</td>
<td>Min 0.4</td>
</tr>
<tr>
<td>Wt of laboratory sample (depending on seed size)²</td>
<td>kg</td>
<td>1 - 5</td>
<td>1 - 5</td>
<td>1 - 5</td>
<td>1 - 5</td>
</tr>
<tr>
<td>No of laboratory samples produced per consignment</td>
<td>#</td>
<td>1 - 10</td>
<td>6 - 10</td>
<td>5 - 10</td>
<td>6 - ~15</td>
</tr>
</tbody>
</table>

¹ When the consignment size is lower than 500 t the lot size should be agreed between the parties.

² The size of the laboratory sample varies according to seed sizes. Table 2 is given as an example of different laboratory sample sizes.

NOTE Where pre-set mechanical samplers are in use, the size of increment in the primary sampler will usually be as large as that recommended and the rate of cut greater than that recommended. In the secondary system, where known, the quantity of the delivered sample relative to the rate of flow should be stated in order that the final sample may be aggregated to meet the quantity recommended.

5 Apparatus

The apparatus required for sampling and division falls under the following headings.

5.1 Apparatus for sampling from bags, sack-type spears or triers, cylindrical samplers, conical samplers and hand-scoops.

5.2 Apparatus for sampling from stationary lots in bulk and for manual sampling from moving lots, shovels, hand-scoops (e.g. Ellis cup), cylindrical samplers, conical samplers and other apparatus for taking small periodical increments from a flow of seeds (e.g. Pelican sampler).

5.3 Mechanical equipment for sampling moving lots, comprising primary samplers and secondary systems.

NOTE There are many types of systems such as rotary hammer samplers, slotted vessel samplers, diverter samplers and bucket elevator samplers. These are ideally based on principles such that the sample is taken from across the whole of the flow of the product with the exception of the bucket elevator sampler which for practical reasons and in the interests of safety takes samples in the direction of the flow.

5.4 Apparatus for mixing and dividing, shovels and quartering irons, dividing instruments for dividing and reducing individual samples manually drawn or delivered from secondary systems of mechanical samplers.
6 Time and place of sampling and limitation of the size of lots

6.1 General

Whether the consignment is in bulk or in bags, sampling is normally carried out during, and at the place of, loading into or discharge from the ship, barge, wagon or lorry or at the time of entry into or exit from the silo or warehouse, as agreed between the parties concerned.

For sampling purposes, consignments of oilseeds are separated into the following descriptions.

6.1.1 Stationary consignments in bags or in bulk in stockpiles, ships or barge holds, vehicles.

6.1.2 Consignments in motion sampled by manual means.

6.1.3 Consignments in motion sampled by mechanical means.

6.2 Bulk transfer

It is generally advisable to use the following procedures in the case of the bulk transfer of oilseeds.

6.2.1 Transfer from ship, barge or stockpile to lorries and wagons

The increments should be taken either from the flow of product (preferred method) during loading or discharge (particularly for tanker-wagons where internal sampling is not possible), or in the lorry or wagon, as soon as possible after loading, by sampling at least five different positions according to the size of the lorry or wagon (see 7.2.2.3), for the purpose of providing one bulk sample representing each lot.

6.2.2 Transfer from stockpile or ship to barges

The increments should be selected during loading, by sampling from each hold throughout the duration of loading, for the purpose of providing one bulk sample representing each lot.

6.2.3 Transfer to and from stockpiles and/or ships

6.2.3.1 When samples are taken manually, these should be taken across the falling stream taking account of the size of the increment and rate of flow of product.

6.2.3.2 When primary samples are taken by mechanical samplers, these would normally be taken directly from the conveyor belt or across the falling stream taking account of the size of the primary sample and rate of flow of product.

6.2.3.3 With knowledge of the detail and function of the primary sampler, that is, the volume of sample and frequency of cuts relative to the flow of the main product and thence with the density of the product, it is possible to determine the amount of primary sample drawn from a known mass of product moved.

Similarly with knowledge of the secondary system, it is possible to determine the mass of product moved represented by each delivered sample.

Apart from the manual sampling quoted in 6.2.3.1 above, where samples are taken by mechanical samplers it may be assumed that the product of the increment taken by the primary sampler and the frequency of the cut and the subsequent mixing and reduction in the secondary system provides the number of delivered samples which make a bulk sample representing the nominal lot size for the particular consignment.

In addition to the general comments above, attention is drawn to the NOTE below Table 1.
7 Method of taking samples

7.1 General

Sampling shall be carried out by or in the attendance of sampling superintendents appointed by the parties concerned.

As the composition of a lot is seldom, if ever, homogeneous, even in the case of undamaged lots, it is necessary to take a sufficient number of increments either manually or by mechanical sampling to provide a representative bulk sample. Parts of lots which are damaged by sea water or otherwise damaged in transit or out of condition, as well as loose material and sweepings which have been recovered shall be sampled separately from the sound material. Each type of damaged material shall be assessed by mass, sampled and separated from the sound material.

7.2 Taking increments

According to circumstances, the increments shall be taken from products in bulk or in bags by means of the sampling apparatus mentioned in 5.1 and 5.2, used in accordance with 7.2.1 and 7.2.2.

7.2.1 Products in bags

Unless otherwise specified in the contract or unless the practice at a port requires otherwise, increments shall be taken from 2 % of the bags forming the lot, with a minimum of five bags.

If the bags are open, the increments may be taken using cylindrical samplers, conical samplers or other appropriate instruments, preferably after the bags have been emptied.

If the bags (for example jute or polypropylene bags) are closed, the increments may be taken using sack-type spears or triers.

7.2.2 Products in bulk

7.2.2.1 When sampling takes place while the product is in motion, which is the preferred method, where sampling is manual or in mechanical samplers from a falling stream, increments shall be taken across the whole section of the flow, perpendicular to the direction of flow and at time intervals depending on the rate of flow.

In all cases where manual samplers or slotted primary samplers in mechanical equipment are used, these should have a slot opening at least three times the size of the largest seed but this is generally larger.

Where primary samples are taken directly from the conveyor belt, for example by hammer type samplers, account is taken of the size of the primary sample and the rate of flow of product.

The distance between plates of hammer type samplers should be at least three times the size of the largest seed but almost invariably this is much larger.

NOTE 1 For practical purposes and in the interests of safety it may only be possible to take increments from the stream in the direction of the flow. This would be effected manually by using the Ellis Cup sampler and mechanically by the bucket elevator sampler.

NOTE 2 Copra is considered an oilseed within this method but in view of the size, shape and irregularity of copra pieces and the importance of the size and shape of the primary cutters in mechanical samplers and particularly the effect of the entry edges, it is recommended that advice be obtained from the operator of the mechanical sampler that it is capable of handling and producing representative samples of copra.

1 This term is used to designate material which has leaked from its original container, but is not unduly contaminated.
7.2.2.2 When bulk material is sampled in holds during discharge, the increments shall be taken from as many places as possible, excluding the run, and at intervals determined by the rate of discharge.

7.2.2.3 When sampling takes place from laden wagons or lorries, the increments shall be taken at three levels at least (owing to the fact that layering may occur, particularly in vehicles in motion) with a cylindrical sampler or conical sampler, depending on the product, and at the following points.

If the type of wagon or lorry does not allow samples to be taken in this manner, the method of sampling shall be as described for products in motion, which, generally, shall be preferred.

7.2.2.4 Where samples are taken from product in motion, the procedures indicated in 7.2.2.1 above shall apply.

7.3 Bulk samples

The bulk sample for each lot shall be formed by combining the increments taken as described in 7.2.

7.4 Laboratory samples

The bulk sample for each lot shall be mixed and divided using the apparatus described in 5.4 to obtain the laboratory sample. It is usual that several equivalent laboratory samples are required from each lot for the purposes of analysis, retention or arbitration. This number of sets of laboratory samples is generally specified in the relevant trading contract or otherwise agreed between buyer and seller.

For some seeds (e.g. groundnuts in shell) it is advisable to sieve the bulk sample before dividing it and then to add the fines to the laboratory samples in the correct proportion. This is to ensure that the samples contain the same percentage of fines.

8 Sizes of samples related to seed sizes

As indicated in Table 1, only sizes of laboratory samples per lot are quoted overall 1 – 5 kg without reference to seed size. In Table 2, bulk sample quantities are repeated alongside laboratory sample sizes related to seed size.

The sizes of samples given in Table 2 are usually suitable. Larger or smaller samples may be required in some cases, according to the tests to be carried out.
Table 2 — Size of samples of oilseeds (kg)

<table>
<thead>
<tr>
<th>Lot size</th>
<th>Minimum bulk sample size per lot</th>
<th>Laboratory sample size for all lot sizes</th>
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<tr>
<td></td>
<td>500</td>
<td>1,000</td>
</tr>
<tr>
<td>Copra</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>Medium/large</td>
<td>30</td>
<td>40</td>
</tr>
<tr>
<td>Small</td>
<td>8</td>
<td>12</td>
</tr>
</tbody>
</table>

9 Packing and labelling of samples

9.1 Packing of samples

Laboratory samples shall be packed in rigid airtight and moisture-tight containers fitted with airtight and moisture-tight closures. The containers shall be completely filled and the closures shall be sealed to avoid any change in the original moisture content of the sample.

9.2 Labelling of samples

9.2.1 If paper labels are used, their quality and size shall be suitable for the purpose. The eyelet hole in the label shall be reinforced.

9.2.2 Each label shall bear at least the following information.

1. ship or road vehicle;
2. from;
3. to;
4. date arrived;
5. quantity;
6. bulk/bags;
7. goods;
8. identification mark or lot number;
9. number and date of bill of lading or contract;
10. date of sampling;
11. place and point of sampling;
12. sampled by;
13. name of organisation responsible for terms of contract.

The information recorded on the label shall be permanent.

9.2.3 Labels for samples of damaged material shall also indicate the nature of the damage and the proportion or tonnage so affected.

10 Dispatch of samples

Laboratory samples shall be dispatched as soon as possible, and only in exceptional circumstances more than 48 h after sampling has been completed, non-business days excluded.

11 Sampling report

The sampling report shall make reference to this FOSFA Method and shall indicate, in addition to the information necessary for the identification of the sample, the condition of the oilseeds sampled, including signs of insect, mite or rodent infestation visible either in the silo or warehouse or during the operations carried out in the ship or other carrier.

NOTE Such infestation is not always readily apparent in the sample, except on close inspection or sieving.

The report shall also refer to any modifications to the technique described in this FOSFA Method, and all the circumstances that may have influenced sampling.
FOSFA INTERNATIONAL OFFICIAL METHOD
PACKAGING AND STORAGE OF OILSEEDS SAMPLES

1 Scope
This FOSFA method for the labelling, packaging, transport and storage of oilseeds samples is applicable to all samples drawn under the terms of FOSFA International contracts for analysis, arbitration or standards purposes.

2 Label design
2.1 Labels must comply with the FOSFA International Official Method Section 9.2.

2.2 Labels should be completed in legible handwriting, preferably in capital letters, or typed. Labels should be securely attached to the samples they represent.

NOTE 1 It is important that principals' instructions to superintendents make it quite clear whether the samples are being drawn for analysis and arbitration purposes.

3 Packaging
3.1 Samples of all oilseeds (other than palm kernels and other lauric seeds) sent to laboratories for analysis should be packed in water-tight plastic jars with screw caps of the same materials or in glass jars with plastic screw caps, of not less than 500 ml, which shall be filled to the top and sealed.

3.2 Palm kernels, illipe nuts, sheanuts, groundnuts – to be packed in a woven polypropylene bag closed and/or sealed then packed in a strong cotton or linen bag, which is then sealed – bags of plastic sheet must not be used.

4 Storage
4.1 Oilseed samples shall be stored at not more than 20°C. Palm kernel, illipe, sheanuts, copra (and other lauric seeds) should be cold stored at minus 15°C.

4.2 Where the sample is not packed and stored in accordance with this recommendation, the oil content at re-test should be adjusted in relation to the variation in moisture between the original test and the re-test.
FOSFA INTERNATIONAL OFFICIAL METHOD

SAMPLING OF EDIBLE GROUNDNUTS FOR AFLATOXIN TESTING
(Not applicable for groundnuts imported into the European Union)

Please note this method is provisional.

1 Definitions

1.1 lot
An identifiable quantity of a food commodity delivered at one time and determined by an official to have common characteristics, such as origin, variety, type of packaging, packer, consignor or marking.

1.2 sublot
Designated part of a large lot in order to apply the sampling method on that designated part. Each sublot must be physically separate and identifiable.

1.3 incremental sample
A quantity of material taken from a single place in the lot or sublot.

1.4 aggregate sample
The combined total of all incremental samples taken from a lot or sublot.

1.5 laboratory sample
Sample intended for the laboratory (= subsample).

2 General provision

2.1 Material to be sampled
Each lot which is to be examined must be sampled separately. In accordance with the provisions in point 4, large lots should be subdivided into sublots and sampled separately.

2.2 Precautions to be taken

In the course of sampling and preparation of the laboratory samples precautions must be taken to avoid changes which adversely affect the aflatoxin content and the analytical determination or make the aggregate samples unrepresentative.

2.3 Incremental samples
As far as possible incremental samples should be taken at various places distributed throughout the lot or sublot, see Table 1. Departure from this procedure must be recorded in the record referred to in point 2.7.

2.4 Preparation of the aggregate sample and laboratory samples

The aggregate sample is made up by combining and sufficiently mixing the incremental samples.

2.5 Replicate samples
Replicate samples for enforcement, trade (defence) and referee purposes are to be taken from the homogenised laboratory samples.
Packaging and transmission of laboratory samples

Each laboratory sample must be placed in a clean inert container offering adequate protection from contamination and against damage in transit. All necessary precautions must be taken to avoid any change in composition of the laboratory sample which might arise during transportation or storage.

2.6 Sealing and labelling of laboratory sample

Each sample taken from official use shall be sealed at the place of sampling and identified. A record must be kept of each sampling, so that each lot can be identified unambiguously, with the date and place of sampling together with any additional information likely to assist the analyst.

3 Explanatory provisions

3.1 Sampling frequency

Without prejudice to the specific provisions as laid down in point 4, the following formula can be used as a guide for the sampling of lots traded in individual packings (sacks, bags, retail packings, etc).

\[
\text{Sampling frequency (SF)} = \frac{\text{Weight of the lot} \times \text{weight of the incremental sample}}{\text{Weight of the aggregate sample} \times \text{weight of individual packing}}
\]

Weight: in kg
Sampling frequency (SF): every \(n\)th sack or bag from which an incremental sample must be taken (decimal figures should be rounded to the nearest whole number).

3.2 Weight of the incremental sample

The weight of the incremental sample should be about 300 grams, unless otherwise defined in Table 1. For retail packings, the weight of the incremental sample depends on the weight of the retail packing.

4 Specific provisions

4.1 Lots should be subdivided into sublots not exceeding 25 tonnes in weight. The minimum number of incremental samples and aggregate sample size to be taken from each sublot are given in Table 1.

<table>
<thead>
<tr>
<th>Nuts and nut products</th>
<th>Minimum no. of incremental samples</th>
<th>Approximate incremental sample size (g)</th>
<th>Minimum aggregate sample size (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Groundnuts shelled raw/roasted</td>
<td>30</td>
<td>330</td>
<td>10</td>
</tr>
<tr>
<td>Groundnuts in shell</td>
<td>30</td>
<td>660</td>
<td>20*</td>
</tr>
<tr>
<td>Peanut butter</td>
<td>24</td>
<td>200</td>
<td>5</td>
</tr>
</tbody>
</table>

* weight of nuts in shell

The result shall be taken to be the mean of the analytical results of the three independent subsamples.

4.2 Acceptance of a sublot

a. accept if the mean of the independent subsamples conforms with the maximum limit;
b. reject if the mean of the independent subsamples exceeds the maximum limit.