

ISO

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

ISO RECOMMENDATION R 658

OLEAGINOUS SEEDS

DETERMINATION OF IMPURITIES

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BRIEF HISTORY

The ISO Recommendation R 658, *Oleaginous seeds – Determination of impurities*, was drawn up by Technical Committee ISO/TC 34, *Agricultural food products*, the Secretariat of which is held by the Magyar Szabványügyi Hivatal (MSZH).

Work on this question by the Technical Committee began in 1960 and led, in 1963, to the adoption of a Draft ISO Recommendation.

In March 1966, this Draft ISO Recommendation (No. 899) was circulated to all the ISO Member Bodies for enquiry. It was approved, subject to a few modifications of an editorial nature, by the following Member Bodies :

Australia	Hungary	Poland
Belgium	India	Romania
Bulgaria	Iran	South Africa,
Chile	Ireland	Rep. of
Colombia	Israel	Turkey
Czechoslovakia	Italy	U.A.R.
Finland	Netherlands	United Kingdom
France	New Zealand	U.S.S.R.
Germany	Norway	Yugoslavia

No Member Body opposed the approval of the Draft.

The Draft ISO Recommendation was then submitted by correspondence to the ISO Council which decided, in February 1968, to accept it as an ISO RECOMMENDATION.

OLEAGINOUS SEEDS

DETERMINATION OF IMPURITIES

1. SCOPE

This ISO Recommendation describes a method for the determination of impurities in oleaginous seeds used as primary industrial materials, and defines the various categories of impurities as usually understood.

2. DEFINITIONS

- 2.1 By *impurities* are meant all foreign matter, organic and inorganic, other than seeds of the basic species.
- 2.2 By *finer* are meant the particles passing the sieves shown in Table 1 (see clause 5.2.1), according to the species being analysed.

In the case of groundnut, meal from the seeds contained in the fines is not regarded as an impurity.

- 2.3 By *non-oleaginous impurities* are meant non-oleaginous foreign bodies (bits of wood, pieces of metal, stones, seeds of non-oleaginous plants), fragments of stalks, leaves and all other non-oleaginous parts belonging to the oleaginous seed analysed (for example bits of shell, loose or adhering to palm kernels), retained by the sieves with holes of the diameters given shown in Table 1. In the case of seeds sold in their shell, for example sunflower seeds (*Helianthus annuus* Linnaeus) pumpkin seed (*Cucurbita pepo* Linnaeus), the loose shells are regarded as impurities only if their proportion is larger than that of the corresponding kernels present in the same sample.
- 2.4 By *oleaginous impurities* are meant foreign oleaginous seeds.

3. PRINCIPLE

Separation of the impurities by sieving and sorting, into three categories :

- fines,
- non-oleaginous impurities,
- oleaginous impurities.

Determination of the mass of each category.

4. APPARATUS

- 4.1 *Sieves* (see Table 1).
- 4.2 *Tweezers* or other suitable instruments.
- 4.3 *Analytical balance*.

5. PROCEDURE

5.1 Test portion

The test portion is the analysis sample obtained by reduction of the contract sample according to ISO Recommendation R 664, *Oleaginous seeds – Reduction of contract samples to samples for analysis*.

Weigh the test portion with a precision of at least 0.1 %.

5.2 Determination

The determination of impurities should be carried out sufficiently quickly to avoid any appreciable change in the moisture content of the seed.

5.2.1 Separation of fines

Separate the fines quantitatively by sieving the test portion, using a sieve with circular holes of the diameter shown in Table 1. Collect the fines and weigh them to the nearest 0.01 g.

TABLE 1. – Diameter of holes of sieves

Dimensions in millimetres	
Nature of product	Aperture diameter
Copra	2.0
Small seeds (<i>Papaver somniferum</i> , Linnaeus, <i>Brassica sp.</i> , <i>Sinapis sp.</i> , <i>Nicotiana sp.</i>)	0.5
All other oleaginous seeds	1.0

- 5.2.1.1 In the case of groundnut, collect the total fines thus obtained, which include non-oleaginous fines and fines from the seed, weigh these to the nearest 0.01 g and determine their oil content. Determine also the oil content of the pure seeds, in order to calculate the content of non-oleaginous fines.

5.2.2 *Separation of oleaginous and non-oleaginous impurities*

5.2.2.1 GENERAL CASE (copra, seeds of medium size)

In the material retained by the sieve shown in Table 1, separate by means of tweezers (or any other suitable instrument) the non-oleaginous impurities (2.3) on the one hand, if necessary detaching bits of shell adhering to the seeds (e.g. palm kernels), and the oleaginous impurities (2.4) on the other hand.

Weigh separately, to the nearest 0.01 g, each category of impurities.

If specified in the contract, note the nature of the oleaginous impurities in order that this may be recorded in the test report.

5.2.2.2 SMALL SEEDS

Transfer the residue from the sieve shown in Table 1 to a second sieve so as to retain impurities larger than the seeds (or separate these impurities by means of tweezers or any other suitable instrument).

Sort this fraction into non-oleaginous impurities (2.3) and oleaginous impurities (2.4).

Weigh separately, to the nearest 0.01 g, the fines and the two fractions of impurities (non-oleaginous and oleaginous) larger than the seeds, and also the partially sorted seeds.

Using an aliquot portion of the latter fraction of seeds (at least 10 g, weighed to the nearest 0.01 g), separate by sorting, on the one hand the non-oleaginous impurities of about the same size as the pure seeds, and on the other hand the small foreign oleaginous seeds. Weigh these two fractions of impurities to the nearest 0.001 g.

5.2.3 If required, the foreign oleaginous seeds may be grouped and weighed according to species, in order to show in the test report the percentage of each species.

5.2.4 Carry out two determinations on the same prepared sample.

6. EXPRESSION OF RESULTS

6.1 Method of calculation and formulae

6.1.1 Show the content of each category of impurities as a percentage by mass of the seed as received. The sum of these represents the percentage of total impurities.

6.1.2 When the determination of impurities has been carried out on the whole test portion (see clause 5.2.2.1) the percentages by mass are calculated as follows :

$$\text{Fines, per cent} \quad P = M_1 \times \frac{100}{M_0}$$

$$\text{Non-oleaginous impurities, per cent} \quad I_n = M_2 \times \frac{100}{M_0}$$

$$\text{Oleaginous impurities, per cent} \quad I_o = M_3 \times \frac{100}{M_0}$$

$$\text{Total impurities, per cent} \quad I_t = P + I_n + I_o$$

where

M_1, M_2, M_3 are the masses, in grammes, of each category of impurities,

M_0 is the mass, in grammes, of the test portion.

6.1.3 When only a part of the impurities is separated from the whole test portion and the other parts from an aliquot portion of the remainder (see clause 5.2.2.2), the percentages by mass are calculated as follows :

$$\text{Fines, per cent} \quad P = M_1 \times \frac{100}{M_0}$$

$$\text{Non-oleaginous impurities, per cent} \quad I_n = (M_{2a} + M_{2b} \times \frac{M_a}{M_b}) \times \frac{100}{M_0}$$

$$\text{Oleaginous impurities, per cent} \quad I_o = (M_{3a} + M_{3b} \times \frac{M_a}{M_b}) \times \frac{100}{M_0}$$

$$\text{Total impurities, per cent} \quad I_t = P + I_n + I_o$$

where

M_1 is the mass, in grammes, of the fines,

M_{2a} is the mass, in grammes, of the fraction of non-oleaginous impurities larger than seeds of the basic species and separated from the whole test portion,

M_{3a} is the mass, in grammes, of the fraction of oleaginous impurities larger than seeds of the basic species and separated from the whole test portion,

M_{2b} is the mass, in grammes, of the fraction of non-oleaginous impurities of approximately the same size as seeds of the basic species and separated from the aliquot portion of the residue obtained by eliminating, from the test portion, fines and impurities larger than seeds of the basic species,