UNECE STANDARD DDP-02

concerning the marketing and

commercial quality control of

WALNUT KERNELS

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NOTE

Working Party on Agricultural Quality Standards

The commercial quality standards developed by the United Nations Economic Commission for Europe (UNECE) Working Party on Agricultural Quality Standards help facilitate international trade, encourage high-quality production, improve profitability and protect consumer interests. UNECE standards are used by Governments, producers, traders, importers and exporters, and other international organizations. They cover a wide range of agricultural products, including fresh fruit and vegetables, dry and dried produce, seed potatoes, meat, cut flowers, eggs and egg products.

Any member of the United Nations can participate, on an equal footing, in the activities of the Working Party. For more information on agricultural standards, please visit our website <www.unece.org/trade/agr>.

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I. DEFINITION OF PRODUCE

This standard applies to walnut kernels from varieties (cultivars) grown from *Juglans regia L.*

II. PROVISIONS CONCERNING QUALITY

The purpose of the standard is to define the quality requirements for walnut kernels at the export control stage, after preparation and packaging.

A. Minimum requirements [1]

(i) In all classes, subject to the special provisions for each class and the tolerances allowed, walnut kernels must be:

- sufficiently dry to ensure keeping quality;
- sound; produce affected by rotting or deterioration such as to make it unfit for consumption is excluded;
- firm;
- sufficiently developed; shrivelled kernels are to be excluded;
- clean, practically free from any visible foreign matter and from shell;
- free from insects or mites whatever their stage of development;
- free from damage caused by pests ;
- free of any rancidity or oily appearance;
- free from mould;
- free of abnormal external moisture;
- free of foreign smell and/or taste.

The condition of the walnut kernels must be such as to enable them:

- to withstand transport and handling, and
- to arrive in satisfactory condition at the place of destination.

(ii) Moisture content

The walnut kernels shall have a moisture content of not greater than 5 per cent.[2]

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[1] *The definitions of defects are listed in the annex to this document.*

[2] *The method to be used should be one of the methods tested collaboratively and shown to give satisfactory results in inter-laboratory trials for the determination of the moisture content for dry fruit (inshell nuts and kernels) which are given in the standard layout and are reproduced in the annex to this document. The laboratory reference method shall be used in cases of dispute.*

B. Classification

Walnut kernels are classified in the three classes as defined below according to their quality and colour.[3]

(i) ***"Extra" Class*** [4]

Walnut kernels in this class must be of superior quality, uniformly light-coloured with practically no dark straw and/or lemon-yellow colour and with no dark brown.

They must be characteristic of the variety and/or commercial type[5]. They must be practically free from defects with the exception of very slight superficial defects provided that these do not affect the general appearance of the produce, the quality, the keeping quality or its presentation in the package.
Scuffing is allowed on:

- quarters and all pieces,
- halves, provided it covers no more than 10% of the surface area of the skin.

(ii) ***Class I*** [4]

Walnut kernels in this class must be of good quality, of a colour not darker than light brown and/or lemon-yellow.

They must be characteristic of the variety and/or commercial type.[5] Slight defects may be allowed provided that these do not affect the general appearance of the produce, the quality, the keeping quality or its presentation in the package. Scuffing is allowed on:

- quarters and all pieces,
- halves, provided it covers no more than 20% of the surface area of the skin.

(iii) ***Class II*** [4]

This class includes kernels which do not qualify for inclusion in the higher classes, but satisfy the minimum requirements specified above. Walnut kernels in this class must be of a colour not darker than dark brown. Darker kernels may be marketed in this class, provided the colour is indicated on the

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[3] *The official colour chart illustrating the colours allowed will be available after the 49th session of the Specialized Section (21-24 May 2002) from the UNECE Secretariat, Agricultural Standards Unit, Office 432, Palais des Nations, 1211 Geneva, Switzerland.*

[4] *The kernels may be designated by a commercial name, provided that the class is also expressed in the marking.*

[5] *Commercial type: Walnut kernels in each package are of the similar general type and appearance and/or belong to a mix of varieties officially defined by the producing country.*

package. Defects may be allowed, provided that the walnut kernels retain their essential characteristics as regards general appearance, quality, keeping quality and presentation.

This class also includes mixtures of kernels of different colours and designated in the marking by the words 'mixed colours'.

Scuffing is not considered as a defect.

III. PROVISIONS CONCERNING SIZING (STYLES)

Walnut kernels are classified by style as follows:

(i)	halves:	kernels separated into two more or less equal and intact parts;
(ii)		quarters: kernels separated lengthways into four more or less equal pieces;
(iii)		large pieces: portions smaller than a "chipped kernel"[6] but larger than a "broken piece";
(iv)		broken pieces: portions of kernels which can pass through a 8mm sizing screen but not through a 3mm sizing screen;
(v)	large pieces and halves:	a mixture of kernels corresponding to the styles large pieces (iii) and halves (i) and of which the proportion of halves may be specified in the marking.

The different styles are represented in the Annex relating to colour, shape and size.

In addition to the designation of the style in the marking, an indication of the number of pieces per kg may be given optionally.

IV. PROVISIONS CONCERNING TOLERANCES

Tolerances in respect of quality, colour and type shall be allowed in each package for produce not satisfying the requirements of the class indicated.

[6] *A "chipped kernel" means a portion representing at least three-quarters of a "half".*

A. Quality and colour tolerances

Defects allowed [a]	Tolerances allowed (per cent by weight of kernels)		
	Extra	**Class I**	**Class II**
(1) Kernels not satisfying the minimum requirements, which include not more than:	4	6	8
- Rotten kernels	0.5	1 [b]	2 [b]
- Mouldy kernels	0.5	1 [b]	2 [b]
- Shell fragments or foreign matter	0.1	0.1	0.1
(2) Kernels darker in colour,	8	9	10
(3) Scuffing (halves only)	10	10	-

[a] *The definitions of defects are listed in Annex II to this document.*
[b] *Reservation of Poland in favour of a tolerance not exceeding 0.5 per cent.*

B. Mineral impurities

Not greater than 1g/kg acid insoluble ash.

C. Size tolerances (styles)

For all styles, a minimum percentage of kernels corresponding to the style indicated in the marking is required and a maximum percentage by weight of kernels different from the style indicated is tolerated:

Style	Minimum percentage and tolerances allowed (per cent by weight of kernels)					
	Halves	Chipped kernels	Quarters	Large pieces	Broken pieces	Fragments
Halves	85[a]	15[b]	5[c]		1[c]	1[c]
Quarters			85[a]	15[b]	5[c]	1[c]
Large pieces				85[a]	15[b]	1[c]
Broken pieces				10[b]	90[a]	1[d]
Large pieces and halves	20 [b]			65[a]	15[b]	1[c]

[a] *Minimum percentage*
[b] *Tolerances allowed*
[c] *Included in 15% tolerance*
[d] *Included in 10% tolerance*

V. PROVISIONS CONCERNING PRESENTATION

A. Uniformity

The contents of each package may be uniform and contain only kernels of the same origin, crop year, quality, style and when applicable of the same variety and commercial style.

Uniformity of colour is compulsory for Extra Class and Class I.

However, with regard to shape, "halves" which pass through a 15 mm mesh and "chipped kernels" may be included without limitation in consignments of "large pieces".

The visible part of the contents of the package must be representative of the entire contents.

B. Packaging

Walnut kernels must be packed in such a way as to protect the produce properly.

If wooden packaging is used, the produce must be separated from the bottom, sides and lid by paper or suitable protective material.

The materials used inside the package must be new, clean and of a quality such as to avoid causing any external or internal damage to the produce. The use of materials and particularly of paper or stamps bearing trade specifications is allowed provided that the printing or labelling has been done with non-toxic ink or glue.

Kernels may be packed in airtight sealed containers, in a vacuum or in an inert gas.

C. Presentation

Kernels must be presented:

In small unit packages of uniform weight intended for sale directly to the consumer.[7]

Packaged in bulk.

[7] *The regulations of certain importing countries require compliance with a specific range of net weights for closed packages.*

VI. PROVISIONS CONCERNING MARKING

Each package must bear the following particulars in letters grouped on the same side, legibly and indelibly marked and visible from the outside:

A. Identification

Packer	)	Name and address or
and/or	)	officially issued or
Dispatcher	)	accepted code mark [8]

B. Nature of produce

- "Walnut kernels".
- Name of the variety or commercial type for AExtra@ class and class I where applicable (optional for class II).

C. Origin of produce

- Country of origin and, optionally, district where grown, or the national, regional or local place name.

D. Commercial specifications

- Class and optionally a commercial name; the words Amixed colours@ in class II where applicable;
- Style (Ahalves@, Aquarters@, Alarge pieces@, Abroken pieces@ or Alarge pieces and halves@) and optionally the number of pieces per kg;
- Crop year optional, mandatory according to the legislation of the importing country;
- Net weight;
- Best before followed by the date (optional).

E. Official control mark (optional)

This standard was first published in 1983
Revised and adopted as a UNECE Recommendation on Walnut Kernels
for a two year trial period 1996
Trial Period extended for one year 1998
Trial Period extended for one year 1999
Adopted as a revised UNECE Standard 2001
Inclusion of new Annex I 2002

[8] *The national legislation of a number of European countries requires the explicit declaration of the name and address.*

ANNEX I
DETERMINATION OF THE MOISTURE CONTENT FOR DRY PRODUCE (NUTS)

METHOD 1 - LABORATORY REFERENCE METHOD

1. Scope and application

This reference method serves to determine the moisture and volatile matter content for both inshell nuts and shelled nuts (kernels).

2. Reference

This method is based on the method prescribed by ISO: ISO 665-2000 Oilseeds - Determination of moisture and volatile matter content.

3. Definition

Moisture content and volatile matter content for dry produce (inshell nuts and shelled nuts): loss in mass measured under the operating conditions specified in ISO 665-2000 for oilseeds of medium size (see point 7.3 of ISO 665-2000). The moisture content is expressed as mass fraction, in percent, of the mass of the initial sample.

For whole nuts, when moisture content is expressed both on the whole nut and on the kernel, in cases of dispute between the two values, the moisture content value of the whole nut takes precedence.

4. Principle

Determination of the moisture and volatile matter content of a test portion by drying at 103 ± 2º C in an oven at atmospheric pressure, until practically constant mass is reached.

5. Apparatus (see ISO 665-2000 for more details)

5.1 Analytical balance sensitive to 1 mg or better.

5.2 Mechanical mill.

5.3 3 mm round-holes sieve.

5.4 Glass, porcelain or non-corrosive metal containers, provided with well-fitting lids, allowing the test portion to be spread to about 0.2 g/cm ^{2} (approximately 5 mm height).

5.5 Electric oven with thermostatic control capable of being regulated between 101 and 105º C in normal operation.

5.6 Desiccator containing an effective desiccant.

6. Procedure

Follow the operating conditions as specified in ISO 665-2000 for oilseeds of medium size (point 7 and 7.3 of

ISO 665-2000), but with the following specific modifications, concerning the preparation of the test sample.

Although ISO 665-2000 sets up one initial period of 3 hours in the oven set at 103 ± 2º C, for nuts it is recommended one initial period of 6 hours.

6.a Determination of the moisture and volatile matter content of kernels:

For shelled nuts, homogenize the laboratory sample and take a minimum of 100 g of kernels as a test sample.

For inshell nuts, take a minimum of 200 g and, using a nutcracker or hammer, remove the shells and fragments or particles of shell, using the rest as a test sample. The kernel skin (cuticle or spermoderm) is included in the test sample.

Grind and sieve the test sample until the size of the particles obtained is no greater than 3 mm. During the grinding operation, care should be taken to avoid the production of a paste (oily flour), the overheating of the sample and the consequent loss of moisture content (for example, if using a mechanical food chopper, by successive very short grinding and sieving operations).

Spread evenly over the base of the vessel about 10 g of the ground product as a test portion, replace the lid, and weigh the whole vessel. Carry out two determinations on the same test sample.

6.b Determination of moisture and volatile matter content on whole nuts (shell plus kernel):

Homogenize the laboratory sample and take a minimum of 200 g of nuts as a test sample. Remove all the foreign matter (dust, stickers, etc.) from the test sample.

Grind the whole nuts using either a Rass Mill, a Romer Mill or a Brabender apparatus or similar, without overheating the product.

Spread evenly over the base of the vessel about 15 g of the ground product as a test portion, replace the lid, and weigh the whole vessel. Carry out two determinations on the same test sample.

7. Expression of results and test report

Follow all the instructions as specified in ISO 665-2000 (point 9 and 11) for method of calculation and formulae, and for test report, without any modification. [9]

8. Precision

[9] *The main points specified are as follows:*

- *moisture and volatile matter content is expressed as mass fraction, in percent, of the mass of the initial sample.*
- *The result is the arithmetic mean of the two determinations; the difference between the two determinations should not exceed 0.2 % (mass fraction).*
- *The result has to be reported to one decimal place.*

For conditions of repeatability and reproducibility apply specifications of ISO 665-2000 (point 10.2 and 10.3) for soya beans.

METHOD 2: RAPID METHOD

1. Principle

Determination of the moisture content using a measuring apparatus based on the principle of loss of mass by heating. The apparatus should include a halogen or infra-red lamp and a built-in analytical balance, calibrated according to the laboratory method.

The use of apparatus based on the principle of electrical conductivity or resistance, as Moisture Meters, Moisture Testers and similar, is also allowed always at condition that the apparatus has to be calibrated according with the laboratory reference method for the tested product.

2. Apparatus

2.1 Mechanical mill or food chopper.

2.2 3 mm round-holes sieve (unless indicated otherwise by the instructions for use of the apparatus.

2.3 Halogen or infrared lamp with built-in analytical balance sensitive to 1 mg or better.

3. Procedure

3.1 Preparation of sample

Follow the same instructions as given for the laboratory reference method (points 6.a and 6.b), unless indicated otherwise by the instructions for use of the apparatus, particularly with regard to the diameter of the fragments.

3.2 Determination of moisture content

Carry out the determination on two test portions of approximately 5 to 10 g each, unless indicated otherwise by the instructions for use of the apparatus.

Spread the test portion over the base of the test receptacle, thoroughly cleaned in advance, and note the weight of the test portion to within 1 mg.

Follow the procedure indicated in the instructions for use of the apparatus for the product to be tested, in particular with regard to the adjusting of temperatures, the duration of the test and the recording of the weight readings.

4. Expression of results

4.1 Result

The result should be the arithmetic mean of the two determinations, provided that the conditions

of repeatability (4.2) are satisfied. Report the result to one decimal place.

4.2 Repeatability

The difference in absolute value between the respective results of the two determinations performed simultaneously or one immediately after the other by the same operator, under the same conditions on identical test material, must not exceed 0.2%.

5. Test report

The test report must state the method used and the results obtained. The report must contain all information necessary for the full identification of the sample.

ANNEX II

DEFINITION OF DEFECTS FOR WALNUT KERNELS

Any defect adversely affecting the appearance or edibility of the kernel including:

- staining or discolouration: abnormal colouration which covers more than one eighth of the surface of the kernel and which is of a colour in pronounced contrast with the colour of the rest of the kernel (dark blemishes or areas of discolouration);
- embedded dirt: kernels or portions of kernels with dirt or other foreign material embedded into the flesh of the kernel.
- crushing of more than 5% of the volume of the kernel;
- drying defect: the kernel is moist, soft or leathery.

Fragments: Kernel and skin fragments which can pass through a sizing screen of 3 mm diameter.

Shell: Outer shell and/or woody partition from between the halves of the kernel (internal central partition), and any fragments of either.

Shrivelled kernels: Kernel which is seriously shrunken, wrinkled and tough.

Mould: Mould filaments visible to the naked eye.

Decay: Significant decomposition caused by the action of micro-organisms.

Insect damage: Visible damage caused by insects or other animal parasites the presence of dead insects or insect debris.

Foreign matter: Any matter or material not usually associated with the product.

Mineral impurities: Acid insoluble ash.

Rancidity: Oxidation of lipids or free fatty acid production producing a disagreeable flavour.

Foreign smell or taste: Any odour or flavour that is not characteristic of the product.