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Addendum 14

Inshell Walnuts

Note by the secretariat: This document contains the revised UNECE Standard for Inshell Walnuts (DF-01) which was adopted at the fifty-eighth session of the Working Party.

UNECE STANDARD DF-01
concerning the marketing and commercial
quality control of

INSHELL WALNUTS
moving in international trade
between and to UN/ECE member countries

I. DEFINITION OF PRODUCE

This standard applies to inshell walnuts free from outer husks, from varieties (cultivars) grown from *Juglans regia* L, to be supplied to the consumer, walnuts for making oil or to be cracked for extraction of the kernels being excluded.

The expression 'fresh walnuts' or 'early walnuts' means walnuts which have been marketed soon after harvesting and cannot be preserved for a long time, from which the husk has been removed and which have not been treated in any way that tends to change their natural moisture content.

The expression 'dry walnuts' means walnuts which can be preserved for a long time under normal conditions of storage.¹

II. PROVISIONS CONCERNING QUALITY

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

A. Minimum requirements²

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

(a) Characteristics of the shell

- intact:
 - slight superficial damage is not considered as a defect;
 - partially open walnuts are considered to be intact provided that the kernel is physically protected;
 - sound:
 - free from defects likely to affect the natural keeping quality of the fruit;
 - free from attack by pests;

¹ *In the case of transport by closed container, special attention should be paid to air circulation in the container and to the moisture content of the produce.*

² *The definition of defects is given in Annex II to this document.*

- clean; practically free of any visible foreign matter;
- dry; free from abnormal external moisture;
- free from husks.

The shells of dry walnuts must show no trace of hulling.

(b) Characteristics of the kernels

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

(c) The inshell walnuts must be gathered when sufficiently mature.

Walnuts must not be empty.

In the case of *fresh walnuts*, it must be possible to peel off the skin of the kernel easily and the internal central partition must show signs of turning brown.

In the case of *dry walnuts*, the internal central partition must be dry.

The shells may be washed and bleached provided that the treatment applied does not affect the quality of the kernels and is permitted by the regulations of the importing country.

The condition of the inshell walnuts should be such as to enable them:

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

(ii) Moisture content

Dry walnuts shall have a moisture content not greater than 12% for the whole nut and 8% for the kernel.^{3 4}

³ *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 annex I to this document. The laboratory reference method shall be used in cases of dispute.*

⁴ *Reservation from Romania, requesting 10% and 6% respectively.*

The natural moisture content of whole fresh walnuts shall be equal to or greater than 20%.

B. Classification

Inshell walnuts are classified in three classes defined below:

(i) AExtra® class

Inshell walnuts in this class must be of superior quality. They must have the characteristics of the variety or of the mixture of certain varieties officially defined by the producing country and specified in the marking.

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.

This class may not include inshell walnuts whose variety cannot be guaranteed, nor a mixture which is not defined.

Furthermore, only walnuts of the most recent harvest can be included in this class.

(ii) Class I

Inshell walnuts in this class must be of good quality. They must embody the characteristics of the variety, of a commercial type or of a mixture of certain varieties officially defined by the producing country and specified in the marking.

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.

This class may not include inshell walnuts whose variety cannot be guaranteed, nor a mixture which is not defined.

(iii) Class II

This class comprises inshell walnuts which do not qualify for inclusion in the higher classes, but satisfy the minimum requirements specified above.

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

III. PROVISIONS CONCERNING SIZING

Size is defined either by an interval determined by the minimum diameter and the maximum diameter (sizing) or by an indication of the minimum diameter followed by **A**and above^a or **A**and +^a (screening).

Class	Sizing ^a	Screening ^a
Extra and I	32 to 34 mm	34 mm and above
	30 to 32 mm	32 mm and above
	28 to 30 mm	30 mm and above
	27 to 30 mm for oblong varieties ^c	28 mm and above ^b
II	24 to 28 mm	27 mm and above for oblong varieties ^{b c}
	24 to 27 mm for oblong varieties ^c	24 mm and above

^a *In addition to this sizing and screening table, provided that the size is also expressed in the marking, any size name may be used optionally.*

^b *Products classified in Class I may exceptionally be marketed with a screening of 26mm and above.*

^c *The varieties of oblong walnuts have a shell whose height is at least 1.25 times the maximum diameter of the equatorial section.*

IV. PROVISIONS CONCERNING TOLERANCES

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

A. Quality tolerances

In the calculation of tolerances, whatever the class, two half-empty walnuts or four quarter-empty walnuts are counted as one empty walnut.

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Defects allowed ^a	Tolerances allowed (percentage by number of defective fruit)		
	Extra	Class I	Class II
(a) Total tolerances for defects of the shell	7	10	15
(b) Total tolerances for defects of the edible part ^b	8	10	15
of which rancid, rotten or damaged by insects ^c	3	6	8
of which mouldy walnuts	3	4	6

^a The definitions of defects are listed in Annex II to this document.

^b For fresh walnuts, the tolerances for defects of the kernel are as follows: **Extra**: 8%; **Class I**: 12%; **Class II**: 15%.

^c Living insects or animal pests are not permitted in any class.

B. Mineral impurities

Ashes insoluble in acid must not exceed 1 g/kg.

C. Size tolerances

For all classes, a maximum of 10% of inshell walnuts not conforming to the size indicated in the marking is tolerated within the limits such that:

- the nuts correspond to the sizes immediately below or above when the size is designated by an interval determined by the minimum diameter and the maximum diameter (sizing);
- the nuts correspond to the size immediately below when the size is designated by an indication of the minimum diameter followed by **A** and above or **A** and + (screening).

V. PROVISIONS CONCERNING PRESENTATION

A. Uniformity

The contents of each package must be uniform and contain only inshell walnuts of the same origin, crop year and quality. In a single package stated to contain a given variety, a defined mixture of varieties or commercial type, a maximum of 10% of inshell walnuts may belong to other varieties or commercial types.

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

B. Packaging

Inshell walnuts must be packed in such a way as to protect the produce properly.

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, particularly of paper and stamps bearing trade specifications, is allowed provided that the printing or labelling has been done with a non-toxic ink or glue.

Packages must be free of all foreign matter.

C. Presentation

The weight of the packages constituting a batch must be identical. ⁵

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 ⁶

B. Nature of produce

- **AFresh walnuts@** or **AEarly walnuts@** (in the case of fresh walnuts);
AWalnuts@ or **ADry walnuts@** (in the case of dry walnuts).
- Name of the variety or of the mixture defined for the **AExtra@** class; name of the variety, defined mixture or commercial type for class I.

⁵ *The regulations of certain importing countries require compliance with a specific range of net weights for closed packages.*

⁶ *The national legislation of a number of European countries requires the explicit declaration of the name and address.*

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C. Origin of produce

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

D. Commercial specifications

- Class;
- Size, which may be given either:
 - by the minimum and maximum diameters, or
 - by the minimum diameter followed by the words **Aand above@** or **Aand +@**;
- Crop year (mandatory for **AExtra@** class and class I, optional for class II);
- Net weight;
- Date of packaging mandatory for fresh walnuts and optional for dry walnuts;
- Best before followed by the date (optional); for fresh walnuts the indication **ATo be consumed quickly, store preferably in a cool place@**, or the indication **APreservation very limited, store preferably in a cool place.**

E. Official control mark (optional)

This standard was first published as UNECE Standard for Unshelled Walnuts in 1970
Revised 1983
Partially Revised 1991 (Standard Layout)
Revised and adopted as UNECE Standard for Inshell Walnuts 1999
Editorial revision and inclusion of new Annex I 2002

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 $103 \pm 2^\circ \text{C}$ 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 105°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 $103 \pm 2^\circ \text{C}$, 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.⁷

8. Precision

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.

⁷ 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.

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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 INSHELL WALNUTS

A. Defects of the shell:

Any defect affecting the appearance including:

- staining or discolouration: abnormal colour which covers 20% of the surface of the shell of an individual nut and which is of a brown, reddish brown, grey or other colour in pronounced contrast with the colour of the rest of the shell or the majority of shells in the lot;
- adhering dirt, when affecting more than 5 % of the shell surface;
- adhering husk, when affecting more than 10% of the shell surface;
- husking damages: pronounced marks on the shell caused by the operation of mechanically removing the husk.

B. Defects of the edible part (kernel):

Any defects affecting the appearance of the kernel, including blemishes or areas of discolouration: discolouration which affects more than one quarter of the kernel and which is in pronounced contrast with the colour of the rest of the kernel.

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

Ripening defects
for fresh nuts: Kernel which is not sufficiently firm, of which for fresh walnuts: the skin cannot easily be peeled off and/or of which the internal central partition does not show signs of turning brown.

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

Empty nuts: Condition of the walnut in which the kernel has not developed.

C. Defects of the shell and kernel

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 or 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.

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