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Specialized Section on Standardization of
Dry and Dried Produce (Fruit)

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Item 4 (a) of the Provisional Agenda

CONSIDERATION OF UN/ECE RECOMMENDATIONS:
WALNUT KERNELS

Proposal transmitted by the United States

Introduction: The trial period for this recommendation was extended for one year (until November 1999) because no consensus was found on links between colour and grading, definition of styles, tolerances and the definition of terms and defects. A small working group, composed of France, Germany and the United States was created to draw up a harmonized proposal that reflects the interest of all growers. A delegation from France visited California during the 1998 harvest season for information and further discussions on a new colour chart.

UN/ECE RECOMMENDATION DF-02
concerning the marketing and commercial
quality control of

WALNUT KERNELS
moving in international trade
between and to UN/ECE member countries

I. DEFINITION OF PRODUCE

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

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 requirements¹

- (i) In all classes, subject to the special provisions for each class and the tolerances allowed, walnut kernels must be:
- 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;
 - free from living insects or mites whatever their stage of development;
 - free from visible damage by insects, mites or other parasites;
 - free of any rancidity or oily appearance;
 - free from mould;
 - free of abnormal external moisture;
 - free of foreign smell and/or taste.

¹ *The definitions of defects are listed in Annex I to this document.*

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

B. Classification

Walnut kernels are classified in the three classes as defined below according to their quality and colour and in the defect tolerance in Table I:

(i) *"Extra" Class*

Walnut kernels in this class must be of superior quality, ~~uniformly light-coloured with, at most, a trace of yellow, but no trace of amber:~~ show characteristics of the variety and/or commercial type.

~~They must be characteristic of the variety and/or commercial type.~~ 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. Kernel scuffing caused by machine processing is allowed.

(ii) *Class I*

Walnut kernels in this class must be of good quality, ~~of a dark straw, dark yellow, light brown, and/or lemon-yellow colour but not dark brown:~~ show characteristics of the variety and/or commercial type.

~~This class corresponds to kernels also called "Harlequin".~~

~~They must be characteristic of the variety and/or commercial type.~~ 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. Kernel scuffing caused by machine processing is allowed.

(iii) *Class II*

² *The moisture content is determined by the method given in Annex II to this document.*

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This class comprises kernels which do not qualify for inclusion in the higher classes, but satisfy the minimum requirements specified above. ~~They may be dark brown in colour, but not black.~~ Defects may be allowed provided that the walnut kernels retain their essential characteristics as regards general appearance, quality, keeping quality and presentation. Kernel scuffing caused by machine processing is allowed.

C. **Colour Classification** *

- (i) Extra Light
Generally associated with Extra Class
- (ii) Light
Generally associated with Extra Class and Class I
- (iii) Light Amber
Generally associated with Extra Class and Class I
- (iv) Amber
Generally associated with Class I and Class II
- (v) Black
Generally associated with Class II

*Refer to the Official UNECE Walnut Kernel Color Chart

D. **General Product Designations**

- (i) Extra Class:
 - Extra Class Extra Light
 - Extra Class Light
 - Extra Class Light Amber
 - Extra Class Combination*
- (ii) Class I:
 - Class I Light
 - Class I Light Amber
 - Class I Amber
 - Class I Combination*
- (iii) Class II
 - Mixed Color or Combination

* Combination--Mixture of kernel color designations, i.e. Extra Light & Light, Light Amber & Amber, or as designated by international trade practices.

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 with no more than 15 percent three-fourth half kernels
- (ii) chipped kernel: portions of kernels representing at least three-quarters of a half
- (iii) quarters: kernels separated lengthways into four more or less equal pieces lot consists of portions of kernels that will pass through a 16 mm sizing screen and will not pass more than 2 percent thru a 3 mm sizing screen
- (iv) large pieces: portions smaller than a "chipped kernel"³ but larger than a "broken piece" lot consists of portions of kernels that pass through a 14 mm sizing screen, but will not pass maor than 2 percent thru a 3 mm sizing screen
- (v) broken pieces: portions of kernels which can pass through a 6mm 8mm sizing screen, but will not pass more than 2 percent thru a 3 mm sizing screen

International Trade Practices may determine other kernel sizes.

IV. PROVISIONS CONCERNING TOLERANCES

Tolerances in respect of quality, colour and type shall be allowed in each package for produce for kernels not satisfying the requirements of the class indicated. Uniform application of tolerances is an important part of international trade facilitation. Control Services will determine tolerances by the following methods:

- on a lot basis using a composite sample representative of the lot.
- any container or group of containers obviously of a different quality shall be considered a separate lot and sampled separately

³ ~~A "chipped kernel" means a portion representing at least three-quarters of a "half".~~

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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 such as:	4	5	8
- Rotten kernels	0.5 ¹	0.5 ^{1.5}	± ^b 2
- Mouldy kernels ^c	0.5 ¹	0.5 ^{1.5}	± ^b 2
- Shell fragments or foreign matter	0.1	0.1	0.1
(2) Kernels darker in colour, but not black	7	7	7

^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.

^c Reservation of the United Kingdom in favour of a tolerance of not more than 0.05 per cent by weight.

B. Colour Tolerances

	Extra Light	Light	Light Amber	Amber
Darker than Extra Light	7			
Darker than Light	2	9		
Darker than Light Amber		2	12	
Darker than Amber			2	10

Black Kernel Tolerance

Extra Class: 0.5

Class I: 2.0

Class II: 10.0

B. Mineral Impurities

Not greater than 1g/kg acid insoluble ash.

C. Tolerances of styles

For all styles: (percentage by weight)

In a consignment of "halves":

15 per cent may be "chipped kernels", "quarters", "large pieces", "broken pieces" and skin fragments. Under this tolerance, not more than 8 per cent may be "large pieces" and/or "quarters", and not more than \pm 5 per cent may be "broken pieces" and skin fragments.

In a consignment of "quarters":

8 per cent may be kernels smaller than a "quarter" but larger than a "broken piece" and 1 per cent may be "broken pieces" and skin fragments. with no more than 5 percent "broken pieces" and 1 percent skin fragments.

In a consignment of "chipped kernels":

8 per cent may be kernels smaller than a "chipped kernel" but larger than a "broken piece" with no more than 5 percent "broken pieces" and 1 percent skin fragments.

In a consignment of "large pieces":

2 per cent may be "broken pieces" and skin fragments, and at least 60 per cent must be "large pieces". at least 60 percent of the kernels in the lot must meet the requirements of "large pieces."

In a consignment of "broken pieces":

0.5 per cent may be skin fragments. 10 per cent of "broken pieces" may be less than 2 mm in diameter. up to 1 percent of the kernels in the lot may be skin fragments.

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 and style.

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

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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.

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 air-tight 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.~~

~~Packaged in bulk.~~

The different types of presentation for walnut kernels will be determined by international trade practices.

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 ⁴

⁴ *The national legislation of a number of European countries requires the explicit declaration of the name and address.*

B. Nature of produce

"Walnut kernels" if the contents are not visible from the outside.

C. Origin of produce

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

D. Commercial specifications

- Class ("~~Extra~~", "~~I~~" and "~~Harlequin~~" (optional); or "~~H~~") (Extra Class, Class I, Class II). A colour classification may also be added to the grade classification based on international trade practices (optional).
- Style ("halves", "chipped kernels", "quarters", "large pieces", or "broken pieces")
- Crop year (optional)
- Net weight
- Best by end date (optional).

E. Official control mark (optional)

This standard was first published in 1983

Revised and adopted as a UN/ECE Recommendation on Walnut Kernels for a two year trial period 1996

Trial Period extended for one year 1998

ANNEX I DETERMINATION OF THE MOISTURE CONTENT

METHOD I - LABORATORY REFERENCE METHOD

1. Principle

Determination of the moisture content of dried fruits by loss of mass after drying at a temperature of 103°C ($\pm 2^\circ\text{C}$) in a temperature-controlled oven at ambient pressure for 6 hours.

2. Apparatus

- 2.1 Ceramic mortar with appropriate pestle or food chopper.
- 2.2 Analytical balance assensitive to 1 mg.
- 2.3 Cylindrical, flat-bottomed glass or metal containers, 12cm in diameter and 5cm in depth, provided with well-fitting lids.
- 2.4 Electrically heated temperature-controlled oven with good natural ventilation, regulated so that the temperature is maintained at 103°C ($\pm 2^\circ\text{C}$).
- 2.5 Dessicator containing an effective dessicant (e.g. calcium chloride) and provided with a metal plate which allows the containers to cool rapidly.

3. Preparation of the sample

Shell the sample if required and crush the kernels in the mortar, or chop them finely, to obtain fragments of 2-4mm across.

4. Test portion and determination

- 4.1 Dry the containers and their lids in the oven for at least 2 hours and transfer to the dessicator. Allow the containers and lids to cool to room temperature.
- 4.2 Carry out the determination on 4 test portions of approximately 50g each.
- 4.3 Weigh the empty container and lid to the nearest 0.001g (M_0).

- 4.4 Weigh approximately 50g of the test material into the container to the nearest 0.001g. Spread the material all over the base of the container, seal the container quickly with the lid and weigh the whole (M_1). Perform these operations as quickly as possible.
- 4.5 Place the open containers, with their lids beside them, in the oven. Close the oven and allow to dry for 6 hours. Open the oven, quickly cover the containers with their individual lids, and place them in the dessicator to cool. After cooling to ambient temperature, weigh the covered dish to the nearest 0.01g (M_2).
- 4.6 The moisture content of the sample, as percentage by mass is given by the expression:

$$\text{Moisture content} = \frac{M_1 - M_2}{M_1 - M_0} \times 100$$

- 4.7 Report the average value obtained from the four determinations.

METHOD II - RAPID METHOD

1. Principle

Determination of the moisture content using a measuring instrument based on the principle of electrical conductivity. The measuring instrument must be calibrated against the laboratory method.

2. Apparatus

- 2.1 Ceramic mortar with appropriate pestle or food chopper.
- 2.2 Measuring instrument based on the principle of electrical conductivity.

3. Determination

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- 3.1 Fill the glass with the substance to be examined (previously ground in the mortar) and tighten the press until a constant pressure is obtained.
- 3.2 Read the values of the scale.
- 3.3 After each determination, clean the glass thoroughly with a spatula, stiff bristled brush paper napkin, or compressed air pump.

ANNEX II

DEFINITION OF DEFECTS FOR WALNUT KERNELS

Defects of the kernel: Any defect adversely affecting the appearance or edibility of the kernel: ~~including blemishes, areas of discoloration, torn skin, embedded dirt, cracks, crushing.~~

~~Discolouration:~~ Discolouration of the meat when more than one-eighth the volume of the portion of the kernel is severely discolored, or a greater volume is affected by lesser degrees of discoloration producing an equally objectionable appearance.

~~Embedded Dirt~~ Kernels or portions of kernels with dirt or other foreign material embedded into the flesh of the kernel.

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.~~ of the kernel.

Insect damage: Visible damage caused by insects or ~~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.~~

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.
