



**Economic and Social  
Council**

Distr.  
GENERAL

TRADE/WP.7/GE.2/2003/15/Add.1  
6 October 2003

Original: ENGLISH and FRENCH

ECONOMIC COMMISSION FOR EUROPE

COMMITTEE FOR TRADE, INDUSTRY AND  
ENTERPRISE DEVELOPMENT

Working Party on Agricultural Quality Standards

Specialized Section on Standardization of  
Dry and Dried Produce (Fruit)  
50<sup>th</sup> session, 24-27 June 2003, Geneva

REPORT OF THE FIFTIETH SESSION

Addendum 1

**REVISED UNECE STANDARD FOR ALMOND KERNELS**

**Note by the Secretariat:** The Specialized Section agreed the text at its 50<sup>th</sup> session and recommends to the Working Party to adopt it as the revised UNECE Standard for Almond Kernels.

GE.03-32327

**UNECE STANDARD**  
concerning the marketing and commercial quality control of

**ALMOND KERNELS**  
moving in international trade between and to  
UNECE member countries

**I. DEFINITION OF PRODUCE**

This standard applies to sweet almond kernels of varieties (cultivars) grown from *Prunus amygdalus* Batsch, syn. *Prunus dulcis* (Mill.) D.A. Webb, from which the shell (ligneous endocarp) has been removed. The standard does not apply to blanched almond kernels,<sup>1</sup> nor to bitter almonds kernels, almond halves, pieces, sticks, slices, dices etc. It does not apply either to salted, sugared, roasted and other processed almond kernels.

**II. PROVISIONS CONCERNING QUALITY**

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

**A. Minimum requirements**

- (i) In all classes subject to the special provisions for each class and the tolerances allowed, the almond kernels must be:
- sufficiently dry to ensure keeping quality;
  - sweet; bitter almonds are excluded;
  - intact; slight superficial damage or very slight scratches are not considered as a defect;
  - sound; produce affected by rotting or deterioration such as to make it unfit for consumption is excluded; free from gum and brown spot;
  - sufficiently developed; shrunken and shrivelled kernels are to be excluded;
  - normally developed (see specific provisions for twins or doubles);
  - clean, practically free of any visible foreign matter;
  - free from insects or mites whatever their stage of development;
  - free of damage caused by pests;
  - free from blemishes and discoloration rendering them unfit for consumption;
  - free from mould;
  - free from rancidity;

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1      *Kernels from which the skin or tegument has been removed.*

- free of abnormal external moisture;
- free of foreign smell and/or taste.

The condition of the almond 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

Almond kernels shall have a moisture content not greater than 6,5 per cent. <sup>2</sup>

## B. Classification

Almond kernels are classified in three classes defined below:

(i) *"Extra" Class*

Almond kernels in this class must be of superior quality. They must be characteristic of the variety and/or of the commercial type.

They must be free from defects with the exception of very slight superficial defects provided these do not affect the general appearance of the produce, the quality, keeping quality and presentation in the package.

(ii) *Class I*

Almond kernels in this class must be of good quality. They must be characteristic of the variety and/or of the commercial type.

The following slight defects may be allowed provided these do not affect the general appearance of the produce, the quality, keeping quality and presentation in the package.

- slight defects in shape and/or development
- slight defects on the colour of the skin
- superficial or slight scratches

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<sup>2</sup> The moisture content is determined by one of the methods given in Annex II of the Standard Layout – Determination of Moisture content for dry produce (nuts). The laboratory reference method shall be used in cases of dispute.

(iii) ***Class II***

This class includes almond kernels which do not qualify for inclusion in the higher classes but satisfy the minimum requirements specified above.<sup>3</sup>

The following defects may be allowed provided the almond kernels retain their essential characteristics as regards the quality, keeping quality and presentation.

- defects in shape and/or development
- defects on the colour of the skin
- small scratches and/or absence of small parts of the skin

**III. PROVISIONS CONCERNING SIZING**

Almonds kernels shall be either sized or screened. Sizing or screening is compulsory for Extra Class and Class I, and optional for Class II.

Sizing and screening are determined by the maximum diameter of the equatorial section of the almond kernel, by means of round-holed or elongated-holed screens. In addition to this system, other optional sizing and screening systems can be used, such as those based in the number of almond kernels per 100 g or per ounce (28,3495 g).

- (i) Sizing is expressed by an interval defined by a minimum and maximum size in millimetres, which must not exceed 2 mm of difference. When a range in count is specified, the almond kernels shall be fairly uniform in size, and the average count shall be within the range specified.<sup>4</sup>
- (ii) Screening is expressed by a reference to a minimum size, in millimetres, followed by the words “and plus” or other equivalent wording, or by a reference to a maximum number of kernels per 100 g or per ounce, followed by the words “and less” or other equivalent wording.

Alternatively, screening could be expressed by a reference to a maximum size, in millimetres, followed by the words “and less” or other equivalent wording, or by a reference to a minimum number of kernels per 100 g or per ounce, followed by the words “and plus” or other equivalent wording. For produce presented to the final consumer under the specification «screened», this alternative reference is not allowed.

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<sup>3</sup> *In Class II the reference to a variety or commercial type is optional.*

<sup>4</sup> *Fairly uniform in size means that, in a representative sample, the weight of 10 per cent, by count, of the largest whole kernels shall not exceed 1,7 times the weight of the 10 per cent, by count, of the smallest whole kernels.*

#### 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

Defects allowed <sup>5</sup>	Tolerances allowed (per cent of defective almond kernels by weight)		
	Extra	Class I	Class II
a) Total tolerance for kernels not satisfying the minimum requirements, of which no more than:	5	10	15
- Rancid, rotten, mouldy and damaged by insects or other pests <sup>a</sup> of which mouldy:	1	2	3
	0,5	0,5	1
- Gummy, brown spot, blemishes and discoloration	2	3	6
- Bitter almonds	1	3	4
- Shrunken or shrivelled and not sufficiently developed kernels	1	2	4
- Split, broken and halves	1	3	5
- Pieces	1	1	3
- Inshell almonds, shell or skin fragments, dust and foreign matter	0.15	0.25	0.25
b) Other defects (not included in the total tolerances):			
- Chipped and scratched	5	10	15
- Doubles or twins <sup>b</sup>	5	15	20 <sup>c</sup>

<sup>a</sup> Living pests are inadmissible in any class.

<sup>b</sup> When the marking indicates "without doubles" or "without twins", these tolerances shall be reduced to 1 per cent for Extra Class and 3 per cent for Class I and Class II.

<sup>c</sup> In Class II, when the marking indicates "with doubles" or "with twins", no limit of doubles or twins is applied.

<sup>5</sup>

Standard definitions of the defects are listed in the Annex of this document.

For Extra Class and Class I, there may be a maximum of 10 per cent, by weight, of kernels belonging to different varieties or commercial types, from the same local production area. For Class II, where the variety or commercial type are indicated in the marking, a maximum tolerance of 20 per cent is allowed. <sup>6</sup>

**B. Mineral impurities**

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

**C. Size tolerances**

For all classes, when sizing or screening by diameter in millimetres, a maximum of 15 per cent, by weight, of almond kernels not according to the size or screen indicated on the marking is allowed.

When sizing or screening by the number of almond kernels per 100 g or per ounce, no tolerance for counts above or below the specified range or screen shall be allowed.

**V. PROVISIONS CONCERNING PRESENTATION**

**A. Uniformity**

The contents of each package must be uniform and contain only sweet almond kernels of the same origin, crop year, quality and size (if sized). For “Extra” Class and Class I the almond kernels must be of the same variety and/or commercial type <sup>6</sup>and, for “Extra” Class, similar in shape and appearance.

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

**B. Packaging**

Almond 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, 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.

Packages must be free of all foreign matter.

**C. Presentation**

Almond kernels must be presented in bags or solid containers. All consumer packages within each package must be of the same weight.

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<sup>6</sup> *In Class I and Class II, lots using the terms “assorted”, “mixed” or similar terms, are not subject to this requirement.*

## VI. PROVISIONS CONCERNING MARKING

Each package <sup>7</sup> 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 <sup>8</sup>

### B. Nature of produce

- "Almond kernels" or "Almonds"
- Variety or commercial type (optional in Class II)
- Additional specifications ("assorted", "mixed", "without doubles" or "without twins", "with doubles" or "with twins", etc. when appropriate)

### C. Origin of produce

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

### D. Commercial specifications

- Class;
- Size or screen (optional for Class II); expressed in millimetres (or by the count per 100 g or per ounce) either by :
  - the minimum and the maximum diameters, or
  - the minimum diameter followed by the words "and plus" or other equivalent wording, or
  - the maximum diameter, followed by the words "and less" or other equivalent wording.
- Net weight, or (optional or at the request of the importing country) number of consumer packages followed by the net unit weight in the case of transport packages containing such units

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<sup>7</sup> Consumer packages for direct sale to the consumer shall not be subject to these marking provisions but shall conform to national requirements of the importing country. However the markings referred to shall in any event be shown on the transport packaging containing such package units.

<sup>8</sup> The national legislation of a number of European countries requires the explicit declaration of the name and address. In the case where a code mark is used, the reference "packer and/or dispatcher" (or equivalent abbreviations) has to be indicated in close connection with the code mark.

- Crop year (optional); mandatory according to the legislation of the importing country.
- "Best before" followed by the date (optional)

**E. Official control mark (optional)**

First published 1986 (as UNECE Standard for Decorticated Almonds)

Reprinted 1991

Revised 2003



## ANNEX

### DEFINITIONS OF TERMS AND DEFECTS FOR ALMOND KERNELS

Commercial type:	mix of almond varieties defined by the producing country that have similar characteristics and/or appearance, or similar end uses; the terms “assorted”, “mixed” or similar are not considered as commercial types.
Assorted or Mixed almonds:	lot of almond kernels which consists of a mixture of two or more dissimilar varieties or commercial types.
Bitter almond:	almond kernel with a characteristic bitter taste produced by amygdalin, a natural compound of bitter almond varieties.
Double or Twin:	almond kernel of characteristic shape, with one side flat or concave, as a consequence of the development of two kernels in the same shell.
Clean:	practically free from plainly visible adhering dirt or other foreign material.
Normally developed:	almond kernel with its characteristic varietal shape; double or twin kernels are not normally developed.
Sufficiently developed:	almond kernel of normal shape, without aborted or dried out portions; shrunken and shrivelled kernels are not sufficiently developed.
Shrunken or shrivelled:	almond kernel which is extremely flat and wrinkled, or almond kernel with desiccated, dried out or tough portions when the affected portion represents more than one quarter of the kernel.
Chipped kernel:	mechanically damaged almond kernel from which less than one quarter of the kernel is missing; it is not considered as a defect the loss, in aggregate, of less than the equivalent of a circle of 3 mm in diameter.
Scratched kernel:	superficially mechanically damaged almond kernel with absence of part of the skin, affecting or not the endosperm; it is not considered as a defect lacks of skin or scratched areas of less, in aggregate, than the equivalent of a circle of 3 mm in diameter.
Half:	longitudinally split almond kernel from which the two halves (cotyledons) are separated.
Split or broken kernel:	mechanically damaged almond kernel from which more than one quarter of the kernel is missing.
Piece:	small fragment of almond kernel which pass through a 10 mm round meshed sieve.
Mould:	mould filaments visible to the naked eye, either inside or outside of the almond kernel.

Rancidity:	oxidation of lipids or free fatty acid production giving a characteristic disagreeable flavour; an oily appearance of the flesh does not necessarily indicate a rancid condition.
Rotten:	significant decomposition or decay caused by the action of micro-organisms or other biological processes, normally accompanied by changes in texture and/or colour.
Insect or pest damage:	visible damage or contamination caused by insects, mites, rodents or other animal pests, including the presence of dead insects, insect debris or excreta.
Living pests:	presence of living pests (insects, mites or others) at any stage of development (adult, nymph, larva, egg, etc.).
Gummy:	resinous appearing substance, affecting or not the endosperm, covering in aggregate an area more than the equivalent of a circle of 6 mm in diameter
Brown spot:	slightly depressed brown spots on the almond kernel, affecting or not the endosperm, either single or multiple, caused by the sting of insects as the box elder bug ( <i>Leptocoris trivittatus</i> Say), covering in aggregate an area more than the equivalent of a circle of 3 mm in diameter.
Blemish and discoloration	apparent and spread stains, other than gum and brown spot, or severe dark or black discoloration contrasting with the natural colour of the kernel skin, affecting in aggregate more than one quarter of the surface of the almond kernel; it is not considered as a defect the normal colour variations between the kernels of one lot.
Abnormal external moisture:	presence of water, moisture or condensation directly on the surface of the product.
Foreign smell and/or taste:	any odour or taste that is not characteristic of the product.
Foreign matter:	any visible and/or apparent matter or material, including dust, not usually associated with the product, except mineral impurities.

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