



**UNITED STATES STANDARDS FOR  
GRADES of PISTACHIO NUTS**





## PISTACHIO NUTS IN THE SHELL

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### 51.2540 General

- (a) Compliance with the provisions of these standards shall not excuse failure to comply with provisions of applicable Federal or State laws.
- (b) These standards are applicable to pistachio nuts in the shell which may be in a natural, dyed, raw, roasted, or salted state; or in any combination thereof.

### 51.2541 Grades

U.S. Fancy, U.S. Extra No. 1, U.S. No. 1 and U.S. Select Grades. "U.S. Fancy," "U.S. Extra No. 1," "U.S. No. 1," and "U.S. Select" consist of pistachio nuts in the shell which meet the following requirements:

#### (a) Basic Requirements

Free from:

- (i) Foreign material
- (ii) Loose kernels
- (iii) Shell pieces
- (iv) Particles and dust
- (v) Blanks

#### (b) Shells

- (1) Free from:
  - (i) Non-split shells
  - (ii) Shells not split on suture
- (2) Free from damage by:
  - (i) Adhering hull material
  - (ii) Light stain
  - (iii) Dark stain
  - (iv) Other external (shell) defects

#### (c) Kernels

- (1) Well dried, or very well dried when specified in connection with the grade.
- (2) Free from damage by:
  - (i) Immature kernels
  - (ii) Kernel spotting
  - (iii) Other internal (kernel) defects
- (3) Free from serious damage by:
  - (i) Minor insect or vertebrate injury
  - (ii) Insect damage
  - (iii) Mold
  - (iv) Rancidity
  - (v) Decay
  - (vi) Other internal (kernel) defects

(d) The nuts are of a size not less than 30/64 inch in diameter as measured by a round hole screen.

(e) For Tolerances, see 51.2544.

## PISTACHIO NUTS IN THE SHELL

**51.2542 U.S. Artificially Opened**

“U.S. Artificially Opened” consists of artificially opened pistachio nuts in the shell which meet the following requirements:

**(a) Basic Requirements**

- (1) Free from:
  - (i) Foreign material
  - (ii) Loose kernels
  - (iii) Shell pieces
  - (iv) Particles and dust
  - (v) Blanks

**(b) Shells**

- (1) Free from:
  - (i) Non-split shells
  - (ii) Shells not split on suture
- (2) Free from damage by:
  - (i) Adhering hull material
  - (ii) Light stained
  - (iii) Dark stained
  - (iv) Other external (shell) defects

**(c) Kernels**

- (1) Well dried or very well dried when specified in connection with the grade
- (2) Free from damage by:
  - (i) Immature kernels
  - (ii) Kernel spotting
  - (iii) Other internal (kernel) defects
- (3) Free from serious damage by:
  - (i) Minor insect or vertebrate injury
  - (ii) Insect damage
  - (iii) Mold
  - (iv) Rancidity
  - (v) Decay
  - (vi) Other internal (kernel) defects

**(d) The nuts are of a size not less than 30/64 inch in diameter as measured by a round hole screen.**

**(e) For Tolerances, see 51.2544.**

**51.2543 U.S. Non-Split**

“U.S. Non-Split” consists of non-split pistachio nuts in the shell which meet the following requirements:

**(a) Basic Requirements**

- (1) Free from:
  - (i) Foreign material
  - (ii) Loose kernels
  - (iii) Shell pieces
  - (iv) Particles and dust
  - (v) Blanks

**(b) Shells**

- (1) Free from damage by:
  - (i) Adhering hull material
  - (ii) Dark stain

**(c) Kernels**

- (1) Well dried, or very well dried when specified in connection with the grade
- (2) Free from damage by:
  - (i) Immature kernels
  - (ii) Kernel spotting
  - (iii) Other internal (kernel) defects
- (3) Free from serious damage by:
  - (i) Minor insect or vertebrate injury
  - (ii) Insect damage
  - (iii) Mold
  - (iv) Rancidity
  - (v) Decay
  - (vi) Other internal (kernel) defects

**(d) The nuts are of a size not less than 30/64 inch in diameter as measured by a round hole screen.**

**(e) For Tolerances, see 51.2544.**

## PISTACHIO NUTS IN THE SHELL



### 51.2544 Tolerances

(a) In order to allow for variations incident to proper grading and handling, the tolerances in Tables I, II, and III of this section are provided.

| <b>Table I - Tolerances</b>                       | <b>U.S. FANCY</b> | <b>U.S. EXTRA NO.1</b> | <b>U.S. NO.1</b> | <b>U.S. SELECT</b> | <b>U.S. ARTIFICIALLY OPENED</b> | <b>U.S. NON-SPLIT</b> |
|---|-------------------|------------------------|------------------|--------------------|---------------------------------|-----------------------|
| <b>Factor</b>                                     |                   |                        |                  |                    |                                 |                       |
| External (shell) Defects (tolerances by weight)   | Percent           | Percent                | Percent          | Percent            | Percent                         | Percent               |
| (a) Non-Split and Not Split on suture             | 2                 | 3                      | 6                | 10                 | 10                              | N/A                   |
| (1) Non-Split included in (a)                     | 1                 | 2                      | 3                | 4                  | 4                               | N/A                   |
| (b) Adhering Hull Material                        | 1                 | 1                      | 1                | 2                  | 2                               | 2                     |
| (c) Light Stained                                 | 7                 | 12                     | 25               | N/A                | N/A                             | N/A                   |
| (1) Dark Stained, included in (c)                 | 2                 | 3                      | 3                | 3                  | 3                               | 3                     |
| (d) Damage by Other Means                         | 1                 | 1                      | 2                | 3                  | 10                              | N/A                   |
| (e) Total External Defects                        | 9                 | 16                     | N/A              | N/A                | N/A                             | N/A                   |
| (f) Undersized (Less than 30/64 inch in diameter) | 5                 | 5                      | 5                | 5                  | 4                               | 5                     |

| <b>Table II - Tolerances</b>  | <b>U.S. FANCY</b> | <b>U.S. EXTRA NO.1</b> | <b>U.S. NO.1</b> | <b>U.S. SELECT</b> | <b>U.S. ARTIFICIALLY OPENED</b> | <b>U.S. NON-SPLIT</b> |
|---|-------------------|------------------------|------------------|--------------------|---------------------------------|-----------------------|
| <b>Factor</b>   |                   |                        |                  |                    |                                 |                       |
| Internal (kernel) Defects (tolerances by weight)                            | Percent           | Percent                | Percent          | Percent            | Percent                         | Percent               |
| (a) Damage  | 3                 | 6                      | 6                | 6                  | 6                               | 6                     |
| (b) Serious Damage (Minor Insect or Vertebrate Injury, Mold, Rancid, Decay) | 3                 | 4                      | 4                | 4                  | 4                               | 4                     |
| (1) Insect Damage, included in (b)  | 1                 | 2                      | 2                | 2                  | 2                               | 2                     |
| (c) Total Internal Defects  | 4                 | 8                      | 9                | 9                  | 9                               | 9                     |

| <b>Table III - Tolerances</b>   | <b>U.S. FANCY</b> | <b>U.S. EXTRA NO.1</b> | <b>U.S. NO.1</b> | <b>U.S. SELECT</b> | <b>U.S. ARTIFICIALLY OPENED</b> | <b>U.S. NON-SPLIT</b> |
|---|-------------------|------------------------|------------------|--------------------|---------------------------------|-----------------------|
| <b>Factor</b>   |                   |                        |                  |                    |                                 |                       |
| Other Defects (tolerances by weight)                                      | Percent           | Percent                | Percent          | Percent            | Percent                         | Percent               |
| (a) Shell Pieces and Blanks   | 2                 | 2                      | 2                | 2                  | 2                               | 2                     |
| (1) Blanks, included in (a)   | 1                 | 1                      | 1                | 1                  | 1                               | 1                     |
| (b) Foreign Material (no glass, metal or live insects shall be permitted) | .25               | .25                    | .25              | .25                | .25                             | .25                   |
| (c) Particles and Dust  | .25               | .25                    | .25              | .25                | .25                             | .25                   |
| (d) Loose Kernels   | 4                 | 5                      | 6                | 6                  | 6                               | 6                     |

## PISTACHIO NUTS IN THE SHELL

### 51.2545 Application of Tolerances

The tolerances for the grades apply to the entire lot and shall be based on a composite sample drawn from containers throughout the lot. Any container or group of containers which have nuts obviously different in quality or size from those in the majority of the containers shall be considered a separate lot and shall be sampled separately.

### 51.2546 Size Designation

Nuts may be considered as meeting a size designation specified in Table IV or a range in number of nuts per ounce, provided, the weight of 10 percent, by count, of the largest nuts in a sample does not exceed 1.50 times the weight of 10 percent, by count, of the smallest and the average number of nuts per ounce is not more than one-half nut above or below the extremes of the range specified.

| Table IV - Nut Size<br>Size Designations | Average Number of<br>Nuts Per Ounce <sup>1</sup> |
|--|--|
| Colossal                                 | Less than 18                                     |
| Extra Large                              | 18 to 20   |
| Large                                    | 21 to 25   |
| Medium                                   | 26 to 30   |
| Small                                    | More than 30                                     |

<sup>1</sup> Before Roasting

### 51.2547 Definitions

- (a) *Well dried* means the kernel is firm and crisp.
- (b) *Very well dried* means the kernel is firm and crisp and the average moisture content of the lot does not exceed 7 percent or is specified. (See 51.2548.)
- (c) *Loose kernels* means edible kernels or kernel portions which are out of the shell and which cannot be considered particles and dust.
- (d) *External (shell) defects* means any blemish affecting the hard covering around the kernel. Such defects include, but are not limited to, non-split shells, shells not split on suture, adhering hull material, light stained, or dark stained.
  - (1) *Damage by External (shell) defects* means any specific defect described in paragraphs (d) (1) (i) through (v) of this section, or an equally objectionable variation of any one of these defects, any other defect, or any combination of defects, which materially detracts from the appearance or the edible or marketing quality of the individual shell or of the lot. (For Tolerances, see 51.2544, Table I.)
    - (i) *Non-split shells* means shells are not opened or are partially opened and will not allow an 18/1000 (.018) inch thick by 1/4 (.25) inch wide gauge to slip into the opening.
    - (ii) *Not split on suture* means shells are split other than on the suture and will allow an 18/1000 (.018) inch thick by 1/4 (.25) inch wide gauge to slip into the opening.
    - (iii) *Adhering hull material* means an aggregate amount covers more than one-eighth of the total shell surface, or when readily noticeable on dyed shells.
    - (iv) *Light stained on raw or roasted nuts* means an aggregate amount of yellow to light brown or light gray discoloration is noticeably contrasting with the predominate color of the shell and affects more than one-fourth of the total shell surface or, on dyed nuts, when readily noticeable.
    - (v) *Dark stained on raw or roasted nuts* means an aggregate amount of dark brown, dark gray or black discoloration affects more than one-eighth of the total shell surface, or, on dyed nuts, when readily noticeable, provided that speckled appearing stain located within the area of one-fourth of the shell nearest the stem end shall be disregarded.



## PISTACHIO NUTS IN THE SHELL

### 51.2547 Definitions (continued)

(e) **Internal (kernel) defects** means any blemish affecting the kernel. Such defects include, but are not limited to, evidence of insects, immature kernels, rancid kernels, mold, or decay.

(1) *Damage by Internal (kernel) defects* means any specific defect described in paragraphs (e) (1) (i) through (ii) of this section, or an equally objectionable variation of any one of these defects, any other defect, or any combination of defects, which materially detracts from the appearance or the edible or marketing quality of the individual kernel or of the lot.

(For Tolerances, see 51.2544, Table II.)

(i) *Immature kernels* are excessively thin or when a kernel fills less than three-fourths, but not less than one-half the shell cavity.

(ii) *Kernel spotting* refers to dark brown or dark gray spots aggregating more than one-eighth of the surface of the kernel.

(2) *Serious damage by Internal (kernel) defects* means any specific defect described in paragraphs (e) (2) (i) through (v) of this section, or an equally objectionable variation of any one of these defects, any other defect, or any combination of defects, which seriously detracts from the appearance or the edible or the marketing quality of the individual kernel or of the lot. (For Tolerances, see 51.2544, Table II.)

(i) *Minor insect or vertebrate injury* means the kernel shows conspicuous evidence of feeding.

(ii) *Insect damage* means an insect, insect fragment, web or frass attached to the kernel. No live insects shall be permitted.

(iii) *Mold* which is readily visible on the shell or kernel.

(iv) *Rancidity* means the kernel is distinctly rancid to taste. Staleness of flavor shall not be classed as rancidity.

(v) *Decay* means one-sixteenth or more of the kernel surface is decomposed.

(f) **Other defects** means defects which cannot be considered internal defects or external defects. Such defects include, but are not limited to, shell pieces, blanks, foreign material or particles and dust. The following shall be considered other defects.

(For Tolerances, see 51.2544, Table III.)

(1) *Shell pieces* means open inshell nuts not containing a kernel, half shells or pieces of shell which are loose in the sample.

(2) *Blank* means a non-split shell not containing a kernel or containing a kernel that fills less than one-half the shell cavity.

(3) *Foreign material* means leaves, sticks, loose hulls or hull pieces, dirt, rocks, insects or insect fragments not attached to nuts, or any substance other than pistachio shells or kernels. Glass, metal or live insects shall not be permitted.

(4) *Particles and dust* means pieces of nut kernels which will pass through a 5/64 inch round hole screen.

(5) *Undersize* means pistachio nuts in the shell which fall through a 30/64 inch round hole screen.

### 51.2548 Average Moisture Content Determination

(a) **Determining average moisture content of the lot is not a requirement of the grades, except when nuts are specified as "very well dried."** It may be carried out upon request in connection with grade analysis or as a separate determination.

(b) **Nuts shall be obtained from a randomly drawn composite sample. Official certification shall be based on the air-oven method or other officially approved methods or devices. Results obtained by methods or devices not officially approved may be reported and shall include a description of the method or device and the owner of any equipment used.**

### 51.2549 Metric Conversion Table

Use the following table for metric conversion:

| Inches  | Millimeters |
|---------|-------------|
| 5/64    | 1.98        |
| 18/1000 | 0.46        |
| 1/4     | 6.35        |
| 30/64   | 11.88       |
| Ounces  | Grams       |
| 1       | 28.35       |
| 2       | 56.7        |

## SHELLED PISTACHIO NUTS



### 51.2555 General

- (a) **Compliance with the provisions of these standards shall not excuse failure to comply with provisions of applicable Federal or State laws.**
- (b) **These standards are applicable to raw, roasted, salted or salted/roasted pistachio kernels.**

### 51.2556 Grades

- (a) **“U.S. Fancy,” “U.S. Extra No. 1,” and “U.S. No. 1” consist of pistachio kernels which meet the following requirements:**
- (1) Well dried, or very well dried when specified in connection with the grade.
  - (2) Free from:
    - Foreign material, including inshell nuts, shells or shell fragments
  - (3) Free from damage by:
    - (i) Immature kernels
    - (ii) Kernel spotting
    - (iii) Other defects
  - (4) Free from serious damage by:
    - (i) Mold
    - (ii) Minor insect or vertebrate injury
    - (iii) Insect damage
    - (iv) Rancidity
    - (v) Decay
    - (vi) Other defects
  - (5) Unless otherwise specified, kernels shall meet the size classification of Jumbo Whole Kernels (See 51.2559).

### 51.2557 Tolerances

**In order to allow for variations incident to proper grading and handling, the tolerances, by weight, are provided below.**

| Table 1 - Tolerances  | U.S. FANCY | U.S. EXTRA NO.1 | U.S. NO.1 |
|---|------------|-----------------|-----------|
| Factor (tolerances by weight)   | Percent    | Percent         | Percent   |
| (a) Damage  | 2.0        | 2.5             | 3.0       |
| (b) Serious Damage (Minor Insect or Vertebrate Injury, Mold, Rancid, Decay) | 1.5        | 2.0             | 2.5       |
| (1) Insect Damage, included in (b)  | .3         | .4              | .5        |
| (c) Foreign Material  | .03        | .05             | .1        |

### 51.2558 Application of Tolerances

The tolerances for the grades apply to the entire lot and shall be based on a composite sample representative of the lot. Any container or group of containers that have kernels obviously different in quality or size from those in the majority of containers shall be considered a separate lot and shall be sampled separately.

### 51.2559 Size Classifications

- (a) **The size of pistachio kernels may be specified in connection with the grade in accordance with one of the following size classifications.**
- (1) **Jumbo Whole Kernels:** 80 percent or more, by weight, shall be whole kernels and not more than 5 percent of the total sample shall pass through a 24/64 inch round hole screen, with not more than 1 percent passing through a 16/64 inch round hole screen.
  - (2) **Large Whole Kernels:** 80 percent or more, by weight, shall be whole kernels and not more than 2 percent of the total sample shall pass through a 16/64 inch round hole screen.
  - (3) **Large Split Kernels:** 75 percent or more, by weight, shall be half kernels split lengthwise and not more than 5 percent of the total sample shall pass through a 16/64 inch round hole screen.
  - (4) **Whole and Broken Kernels:** means a mixture of any combination of whole kernels or pieces. The percentage of whole kernels and/or pieces may be specified. Not more than 5 percent of the total sample shall pass through a 5/64 inch round hole screen.



## SHELLED PISTACHIO NUTS

### 51.2560 Definitions

- (a) *Well dried* means the kernel is firm and crisp.
- (b) *Very well dried* means the kernel is firm and crisp, and the average moisture content of the lot does not exceed 7 percent or is specified (See 51.2561).
- (c) *Foreign material* means leaves, sticks, inshell nuts, shells or pieces of shells, dirt, or rocks, or any other substance other than pistachio kernels. No allowable tolerances for metal or glass.
- (d) *Whole kernel* means 3/4 of a kernel or more.
- (e) *Splits* means more than 3/4 of a half kernel split lengthwise.
- (f) *Damage* means any specific defect described in paragraph (f) (1) through (2) of this section, or an equally objectionable variation of any one of these defects, any other defect, or any combination of defects that materially detracts from the appearance or the edible or marketing quality of the individual kernel or of the lot. (For Tolerances, see 51.2557, Table I.)
  - (1) *Immature kernels* are excessively thin kernels and can have black, brown or gray surface with a dark interior color and the immaturity has adversely affected the flavor of the kernel.
  - (2) *Kernel spotting* refers to dark brown or dark gray spots aggregating more than one-eighth of the surface of the kernel.
- (g) *Serious damage* means any specific defect described in paragraph (g) (1) through (5) of this section, or an equally objectionable variation of any one of these defects, any other defect, or any combination of defects, which seriously detracts from the appearance or the edible or marketing quality of the individual kernel or of the lot. (For Tolerances, see 51.2557, Table I.)
  - (1) *Mold* which is readily visible on the kernel
  - (2) *Minor insect or vertebrate injury* means the kernel shows conspicuous evidence of feeding
  - (3) *Insect damage* means an insect, insect fragment, web or frass attached to the kernel. No live insects shall be permitted.
  - (4) *Rancidity* means the kernel is distinctly rancid to taste. Staleness of flavor shall not be classed as rancidity.
  - (5) *Decay* means one-sixteenth or more of the kernel surface is decomposed.

### 51.2561 Average Moisture Content Determination

- (a) Determining average moisture content of the lot is not a requirement of the grades, except when kernels are specified as "very well dried." It may be carried out upon request in connection with grade analysis or as a separate determination.
- (b) Kernels shall be obtained from a randomly drawn composite sample. Official certification shall be based on the air-oven method or other officially approved methods or devices. Results obtained by methods or devices not officially approved may be reported and shall include a description of the method or device and the owner of any equipment used.

### 51.2562 Metric Conversion Table

Use the following table for metric conversion:

| Inches | Millimeters |
|--------|-------------|
| 5/64   | 1.98        |
| 16/64  | 6.35        |
| 24/64  | 9.53        |
| Ounces | Grams       |
| 1      | 28.35       |
| 2      | 56.7        |



## Comparing American Pistachios to Pistachios From Other Countries of Origin



**AMERICAN**



LARGE MEDIUM SMALL



FRONT SIDE



**TURKEY**



LARGE MEDIUM SMALL



FRONT SIDE



**IRAN**

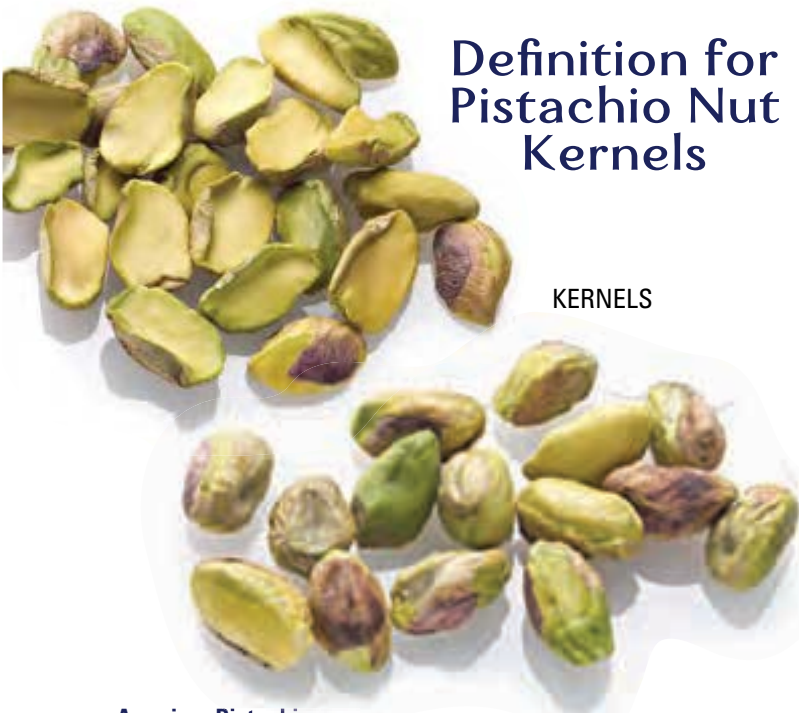


LARGE MEDIUM SMALL



FRONT SIDE

### Definition for Pistachio Nut Kernels



KERNELS

### Definitions for Defective Pistachio Nuts



THIRD FINGER DEFECT

## Definitions for Defective Pistachio Nuts



LIGHT STAIN



DARK STAIN



ADHERING HULL



NO SPLIT ON SUTURE



MOLD



MECHANICAL DAMAGE

## Definitions for Defective Pistachio Nuts



FOREIGN MATERIAL



EMPTIES



ARTIFICIALLY OPENED



CRINKLE SHELL



NON-SPLIT SHELL



BLEACHED