



**United States
Department of
Agriculture**

**Agricultural
Marketing
Service**

**Fruit and
Vegetable
Division**

**Fresh
Products
Branch**

United States Standards for Grades of Shelled Pecans

Effective July 15, 1969
(Reprinted - January 1997)

United States Standards for Grades of Shelled Pecans¹

Grades

- 51.1430 U.S. No. 1 Halves.
- 51.1431 U.S. No. 1 Halves and Pieces.
- 51.1432 U.S. No. 1 Pieces.
- 51.1433 U.S. Commercial Halves.
- 51.1434 U.S. Commercial Halves and Pieces.
- 51.1435 U.S. Commercial Pieces.

Color Classifications.

- 51.1436 Color classifications.

Size Classifications

- 51.1437 Size classifications for halves.
- 51.1438 Size classifications for pieces.

Tolerances for Defects

- 51.1439 Tolerances for defects.

Application of Standards

- 51.1440 Application of standards.

Definitions

- 51.1441 Half-kernel.
- 51.1442 Piece.
- 51.1443 Particles and dust.
- 51.1444 Well dried.
- 51.1445 Fairly well developed.
- 51.1446 Poorly developed.
- 51.1447 Fairly uniform in color.
- 51.1448 Fairly uniform in size.
- 51.1449 Damage.
- 51.1450 Serious damage.

Metric Conversion Table

- 51.1451 Metric conversion table.

U.S. Grades

§51.1430 U.S. No. 1 Halves.

"U.S. No. 1 Halves" consists of pecan half-kernels which meet the following requirements:

- (a) For quality:
 - (1) Well dried;
 - (2) Fairly well developed;

¹Packing of the product in conformity with the requirements of these standards shall not excuse failure to comply with the provisions of the Federal Food, Drug, and Cosmetic Act, or with applicable State laws and regulations.

- (3) Fairly uniform in color;
 - (4) Not darker than "amber" skin color;
 - (5) Free from damage or serious damage by any cause;
 - (6) Free from pieces of shell, center wall and foreign material; and,
 - (7) Comply with tolerances for defects (see §51.1439); and,
- (b) For size:
- (1) Halves are fairly uniform in size;
 - (2) Halves conform to size classification or count specified; and,
 - (3) Comply with tolerances for pieces, particles, and dust (see §51.1437).

§51.1431 U.S. No. 1 Halves and Pieces.

The requirements for this grade are the same as those for U.S. No. 1 Halves except:

- (a) For size:
- (1) At least 50 percent, by weight, are half-kernels;
 - (2) Both halves and pieces will not pass through a 5/16 inch round opening; and,
 - (3) Comply with tolerances for undersize. (See Table III.)

§51.1432 U.S. No. 1 Pieces.

The requirements for this grade are the same as those for U.S. No. 1 Halves except:

- (a) For quality:
- (1) No requirement for uniformity of color; and,
- (b) For size:
- (1) No requirement for percentage of half-kernels;
 - (2) Conform to any size classification or other size description specified; and,
 - (3) Comply with applicable tolerances for off-size. (See Table III.)

§51.1433 U.S. Commercial Halves.

The requirements for this grade are the same as those for U.S. No. 1 Halves except:

- (a) For quality:
- (1) No requirement for uniformity of color; and,
 - (2) Increased tolerances for defects (see §51.1439); and,
- (b) For size:
- (1) No requirement for uniformity of size.

§51.1434 U.S. Commercial Halves and Pieces.

The requirements for this grade are the same as those for U.S. No. 1 Halves and Pieces except:

- (a) For quality:
- (1) No requirement for uniformity of color; and,
 - (2) Increased tolerances for defects. (See §51.1439.)

§51.1435 U.S. Commercial Pieces.

The requirements for this grade are the same as those for U.S. No. 1 Pieces except for:

- (a) Increased tolerances for defects. (See §51.1439.)

Color Classifications

§51.1436 Color classifications.

- (a) The skin color of pecan kernels may be described in terms of the color classifications provided in this section. When the color of kernels in a lot generally conforms to the "light" or "light amber" classification, that color classification may be used to describe the lot in

connection with the grade.

(1) "Light" means that the kernel is mostly golden color or lighter, with not more than 25 percent of the surface darker than golden, and none of the surface darker than light brown.

(2) "Light amber" means that the kernel has more than 25 percent of its surface light brown, but not more than 25 percent of the surface darker than light brown, and none of the surface darker than medium brown.

(3) "Amber" means that the kernel has more than 25 percent of the surface medium brown, but not more than 25 percent of the surface darker than medium brown, and none of the surface darker than dark brown (very dark-brown or blackish-brown discoloration).

(4) "Dark amber" means that the kernel has more than 25 percent of the surface dark brown, but not more than 25 percent of the surface darker than dark brown (very dark-brown or blackish-brown discoloration).

(b) U.S. Department of Agriculture kernel color standards, PEC- MC-1, consisting of plastic models of pecan kernels, illustrate the color intensities implied by the terms "golden," "light brown," "medium brown," and "dark brown" referred to in paragraph (a) of this section. These color standards may be examined in the Fruit and Vegetable Division, AMS, U.S. Department of Agriculture, South Building, Washington, D.C. 20250; in any field office of the Fresh Fruit and Vegetable Inspection Service; or upon request of any authorized inspector of such Service. Duplicates of the color standards may be purchased from NASCO, Fort Atkinson, Wis. 53538.

Size Classifications

§51.1437 Size classifications for halves.

The size of pecan halves in a lot may be specified in accordance with one of the size classifications shown in Table I:

TABLE I

Size classifications for halves	Number of halves per pound
Mammoth	250 or less
Junior mammoth	251 - 300
Jumbo	301 - 350
Extra large	351 - 450
Large	451 - 550
Medium	551 - 650
Small (topper)	651 - 750
Midget	751 - or more

(a) The number of halves per pound shall be based upon the weight of half-kernels after all pieces, particles and dust, shell, center wall, and foreign material have been removed.

(b) In lieu of the size classifications in Table I, the size of pecan halves in a lot may be specified in

terms of the number of halves or a range of numbers of halves per pound. For example, "400" or "600 - 700".

(c) Tolerance for count per pound: In order to allow for variations incident to proper sizing, a tolerance shall be permitted as follows:

(1) When an exact number of halves per pound is specified, the actual count per pound may vary not more than 5 percent from the specified number; and,

(2) When any size classification shown in Table I or a range in count per pound is specified, no tolerance shall be allowed for counts outside of the specified range.

(d) **Tolerances for pieces, particles, and dust.** In order to allow for variations incident to proper sizing and handling, not more than 15 percent, by weight, of any lot may consist of pieces, particles, and dust: **Provided**, That not more than one-third of this amount, or 5 percent, shall be allowed for portions less than one-half of a complete half-kernel, including not more than 1 percent for particles and dust.

§51.1438 Size classifications for pieces.

The size of pecan pieces in a lot may be specified in accordance with one of the size classifications shown in Table II.

TABLE II

Size classifications	Maximum diameter (will pass through round opening of following diameter	Minimum diameter (will not pass through round opening of following diameter
		Inch
Mammoth pieces	No limitation	8/16
Extra large pieces	9/16 inch	7/16
Halves and pieces	No limitation	5/16
Large pieces	8/16 inch	5/16
Medium pieces	6/16 inch	3/16
Small pieces	4/16 inch	2/16
Midget pieces	3/16 inch	1/16
Granules	2/16 inch	1/16

(a) In lieu of the size classifications in Table II, the size of pieces in a lot may be specified in terms of minimum diameter, or as a range described in terms of minimum and maximum diameters expressed in sixteenths or sixty-fourths of an inch.

(b) Tolerances for size of pieces: In order to allow for variations incident to proper sizing, tolerances are provided for pieces in a lot which fail to meet the requirements of any size specified. The tolerances, by weight, are shown in Table III.

TABLE III

Size classification	Total tolerance for offsize pieces	Tolerance (included in total tolerance) for pieces smaller than	
		2/16 inch	1/16 inch
	Percent	Percent	Percent
Mammoth pieces	15	1	----
Extra large pieces	15	1	----
Halves and pieces	15	1	----
Large pieces	15	1	----
Medium pieces	15	2	----
Small pieces	15	2	----
Midget pieces	15	----	2
Granules	15	----	5
Other specified size	15	1	----

Tolerances for Defects

§51.1439 Tolerances for defects.

In order to allow for variations incident to proper grading and handling in each of the foregoing grades, the following tolerances, by weight, are provided as specified:

(a) U.S. No. 1 Halves, U.S. No. 1 Halves and Pieces, and U.S. No. 1 Pieces grades:

- (1) 0.05 percent for shell, center wall, and foreign material;
- (2) 3 percent for portions of kernels which are "dark amber" or darker color, or darker than any specified lighter color classification but which are not otherwise defective; and,
- (3) 3 percent for portions of kernels which fail to meet the remaining requirements of the grade, including therein not more than 0.50 percent for defects causing serious damage: **Provided**, That any unused portion of this tolerance may be applied to increase the tolerance for kernels which are "dark amber" or darker color, or darker than any specified lighter color classification.

(b) U.S. Commercial Halves, U.S. Commercial Halves and Pieces, and U.S. Commercial Pieces grades:

- (1) 0.15 percent for shell, center wall, and foreign material;
- (2) 25 percent for portions of kernels which are "dark amber" or darker color, or darker than any specified lighter color classification, but which are not otherwise defective; and,
- (3) 8 percent for portions of kernels which fail to meet the remaining requirements of the grade, including therein not more than 1 percent for defects causing serious damage.

Application of Standards

§51.1440 Application of standards.

The grade of a lot of shelled pecans shall be determined on the basis of a composite sample drawn at random from containers in various locations in the lot. However, any identifiable container or number of containers in which the pecans are obviously of a quality or size materially different from that in the majority of containers, shall be considered as a separate lot, and shall be sampled and graded separately.

Definitions

§51.1441 Half-kernel.

"Half-kernel" means one of the separated halves of an entire pecan kernel with not more than one-eighth of its original volume missing, exclusive of the portion which formerly connected the two halves of the kernel.

§51.1442 Piece.

"Piece" means a portion of a kernel which is less than seven-eighths of a half-kernel, but which will not pass through a round opening two-sixteenths inch in diameter.

§51.1443 Particles and dust.

"Particles and dust" means, for all size designations except "midget pieces" and "granules," fragments of kernels which will pass through a round opening two-sixteenths inch in diameter.

§51.1444 Well dried.

"Well dried" means that the portion of kernel is firm and crisp, not pliable or leathery.

§51.1445 Fairly well developed.

"Fairly well developed" means that the kernel has at least a moderate amount of meat in proportion to its width and length. (See Figure 1.)

§51.1446 Poorly developed.

"Poorly developed" means that the kernel has a small amount of meat in proportion to its width and length. (See Figure 1.)

§51.1447 Fairly uniform in color.

"Fairly uniform in color" means that 90 percent or more of the kernels in the lot have skin color within the range of one or two color classifications.

§51.1448 Fairly uniform in size.

"Fairly uniform in size" means that, in a representative sample of 100 halves, the 10 smallest halves weigh not less than one-half as much as the 10 largest halves.

§51.1449 Damage.

"Damage" means any specific defect described in this section; or an equally objectionable variation of any one of these defects, or any other defect, or any combination of defects, which materially detracts from the appearance or the edible or marketing quality of the individual portion of the kernel or of the lot as a whole. The following defects should be considered as damage:

- (a) Adhering material from inside the shell when attached to more than one-fourth of the surface on one side of the half-kernel or piece;
- (b) Dust or dirt adhering to the kernel when conspicuous;
- (c) Kernel which is not well dried;
- (d) Kernel which is "dark amber" or darker color;
- (e) Kernel having more than one dark kernel spot, or one dark kernel spot more than one-eighth

inch in greatest dimension;

(f) Shriveling when the surface of the kernel is very conspicuously wrinkled;

(g) Internal flesh discoloration of a medium shade of gray or brown extending more than one-fourth the length of the half-kernel or piece, or lesser areas of dark discoloration affecting the appearance to an equal or greater extent; and,

(h) Poorly developed kernel. (See Figure 1.)

§51.1450 Serious damage.

"Serious damage" means any specific defect described in this section; or an equally objectionable variation of any one of these defects, or any other defect, or any combination of defects, which seriously detracts from the appearance or the edible or marketing quality of the individual portion of kernel or of the lot as a whole. The following defects shall be considered as serious damage:

(a) Any plainly visible mold;

(b) Rancidity when the kernel is distinctly rancid to the taste. Staleness of flavor shall not be classed as rancidity;

(c) Decay affecting any portion of the kernel;

(d) Insects, web, or frass or any distinct evidence of insect feeding on the kernel;

(e) Internal discoloration which is dark gray, dark brown, or black and extends more than one-third the length of the half-kernel or piece;

(f) Adhering material from inside the shell when attached to more than one-half of the surface on one side of the half-kernel or piece;

(g) Dark kernel spots when more than three are on the kernel, or when any dark kernel spot or the aggregate of two or more spots affect an area of more than 10 percent of the surface of the half-kernel or piece;

(h) Dark skin discoloration, darker than "dark brown, when covering more than one-fourth of the surface of the half-kernel or piece; and,

(i) Undeveloped kernel. (See Figure 1.)

Metric Conversion Table

§51.1451 Metric conversion table.

Inches Millimeters (mm)

8/16	12.7
7/16	11.1
6/16	9.5
5/16	7.9
4/16	6.4
3/16	4.8
2/16	3.2
6/64	2.4
5/64	2.0
1/16	1.6

Figure 1

Cross Section Illustration



1. Well Developed

Lower limit. Kernels having less meat content than these are not considered well developed.



2. Fairly Well Developed

Lower limit for U.S. No. 1 grade. Kernels having less meat content than these are not considered fairly well developed and are classed as damaged.



3. Poorly Developed

Lower limit, damaged but not seriously damaged. Kernels having less meat content than these are considered undeveloped and are classed as seriously damaged.

Illustration PCN 1