



**United States
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Branch

United States Standards for Grades of Canned White Potatoes

Effective August 3, 1998

This is the fourth third issue of the United States Standards for Grades of Canned White Potatoes published in the **FEDERAL REGISTER** of July 2, 1998 (63 FR 36201) to become effective August 3, 1998 and amended April 2003. This issue supersedes the third issue, which has been in effect since August 24, 1987.

Voluntary U.S. grade standards are issued under the authority of the Agricultural Marketing Act of 1946, which provides for the development of official U.S. grades to designate different levels of quality. These grade standards are available for use by producers, suppliers, buyers, and consumers. As in the case of other standards for grades of processed fruits and vegetables, these standards are designed to facilitate orderly marketing by providing a convenient basis for buying and selling, for establishing quality control programs, and for determining loan values.

The standards also serve as a basis for the inspection and grading of commodities by the Federal inspection service, the only activity authorized to approve the designation of U.S. grades as referenced in the standards, as provided under the Agricultural Marketing Act of 1946. This service, available as on-line (in-plant) or lot inspection and grading of all processed fruit and vegetable products, is offered to interested parties, upon application, on a fee-for-service basis. The verification of some specific recommendations, requirements, or tolerances contained in the standards can be accomplished only by the use of on-line inspection procedures. In all instances, a grade can be assigned based on final product factors or characteristics.

In addition to the U.S. grade standards, grading manuals or instructions for inspection of several processed fruits and vegetables are available upon request for a nominal fee. These manuals or instructions contain detailed interpretations of the grade standards and provide step-by-step procedures for grading the product.

Grade standards are issued by the Department after careful consideration of all data and views submitted, and the Department welcomes suggestions which might aid in improving the standards in future revisions. Comments may be submitted to, and copies of standards and grading manuals obtained from:

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UNITED STATES STANDARDS FOR GRADES OF CANNED WHITE
POTATOES

EFFECTIVE AUGUST 3, 1998

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Authority: Agricultural Marketing Act of 1946, Secs. 203, 205, 60 Stat. 1087, as amended, 1090, as amended (7 U.S.C. 1621-1627).

Note: Compliance with the provisions 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.

§52.1811 Product description.

Canned white potatoes is the product as defined in the Standards of Identity for Certain Other Canned Vegetables (21 CFR 155.200) issued under the Federal Food, Drug, and Cosmetic Act.

§52.1812 Styles.

- (a) **Whole** consists of peeled white potatoes that retain the approximate original conformation of the whole potato.
- (b) **Slices or sliced** consist of peeled whole white potatoes cut into slices of substantially uniform size.
- (c) **Dice or diced** consist of peeled whole white potatoes cut into slices of substantially uniform thickness.
- (d) **Shoestring, french style, or julienne** consists of peeled whole white potatoes cut into rectangular units having length measurements which are three (3) or more times the width measurements.
- (e) **Pieces** consist of peeled whole white potatoes of random size and/or shape, or potatoes that have been cut into approximate quarters or wedge-shaped units.
- (f) Any combination of two (2) or more of the foregoing styles constitutes a style and shall be considered as a mixture of the individual styles that comprise the combination.

§52.1813 Definitions of terms.

As used in these U.S. standards, unless otherwise required by the context, the following terms shall be construed, respectively, to mean:

- (a) **Blemished** means units affected by brown or black internal or external discoloration, discolored or unpeeled eyes, hollow heart, scab, or units blemished by other means to such an extent that the appearance or eating quality of the unit is materially affected.
- (b) **Seriously blemished** means units affected by brown or black internal or external discoloration, pathological or insect injury or units blemished by other means to such an extent that the appearance or eating quality of the unit is seriously affected.

(c) **Color**

- (1) **Good color** means that the units, exclusive of blemished areas, are practically free from oxidation or light greenish coloration, and have a bright, practically uniform, light color, typical of canned white potatoes processed from potatoes of similar varietal characteristics.
- (2) **Reasonably good color** means that the units possess a reasonably good color, and the units individually or collectively may be variable in color, dull, slightly oxidized, or otherwise discolored but not to the extent that the appearance of the product is seriously affected.
- (3) **Poor color** means the units fail to meet the requirements for reasonably good color.

(d) **Defects:**

- (1) **Practically free from defects** means the defects present do not materially affect the appearance or edibility of the product.
- (2) **Reasonably free from defects** means the defects present do not seriously affect the appearance or edibility of the product.

(e) **Diameter:**

- (1) **Of elongated whole potatoes** means the greatest measurement at right angles to the longitudinal axis of the units.
- (2) **Of round or nearly round whole potatoes** means the greatest measurement across the center of the unit.
- (3) **Of sliced style potatoes** means the shortest measurement of the larger cut surface of the slice.

(f) **Extraneous vegetable material (EVM)** means harmless plant material such as leaves, stems, or roots.

(g) **Flavor and Odor:**

- (1) **Good flavor and odor** means a good, distinctive flavor and odor which is characteristic of properly prepared and properly processed canned white potatoes, (including any permitted safe and suitable optional ingredient(s)), that are free from objectionable flavors or odors.
- (2) **Reasonably good flavor and odor** means that the canned white potatoes, (including any permitted safe and suitable optional ingredient(s)), may be lacking in good flavor and odor but are free from objectionable flavors or odors.

- (h) **Mechanical damage** means damage incurred during harvesting or processing such as broken, crushed or cracked units, and units that are excessively trimmed.
- (i) **Pathological or insect injury** means damage caused by disease or insects.
- (j) **Peel** means the outer layer of the potato that is normally removed during processing.
- (k) **Potato unit** means one whole, slice, dice, shoestring, or piece of potato as applicable for the style.
- (l) **Sample unit size** means the amount of product to be used for grading. It may be:
 - (1) The entire contents of a container;
 - (2) A portion of the contents of a container;
 - (3) A combination of the contents of two (2) or more containers;
 - (4) A portion of unpacked product.
- (m) **Texture.** The factor of texture refers to the tenderness of the canned white potatoes and to the degree of freedom from sloughing and from hard or objectionable coarse-grained units.
 - (1) **Good texture** means the texture of the potatoes is practically uniform and is typical of properly prepared and properly processed potatoes and that the potatoes are firm and tender and have a fine and even grain. There may be sloughing to a degree that does not more than slightly affect the appearance of the product.
 - (2) **Reasonably good texture** means the potatoes are reasonably tender, and may be variable in texture, ranging from somewhat soft to firm, but are not tough, hard or mushy. There may be a moderate amount of sloughing that does not seriously affect the appearance of the product.

- (3) **Poor texture** means the potato units fail to meet the requirements for reasonably good texture.

§52.1814 Recommended fill of container.

- (a) **The fill of container** is not incorporated in the grades of the finished product since fill of container, as such, is not a factor of quality for the purposes of these grades. Each container shall be filled with white potatoes as full as practicable without impairment of quality and the product and packing medium shall occupy not less than 90 percent of the total capacity of the container.
- (b) **Total capacity of the container** means the maximum weight of distilled water, at 68 degrees Fahrenheit (20 degrees Celsius), which the sealed container will hold.

§52.1815 Recommended minimum drained weights.

(a) General.

- (1) The minimum drained weight values are given in Table I. They are not incorporated in the grades of the finished product since drained weight, as such, is not a factor of quality for the purposes of these grades.
- (2) The minimum drained weights are based on the weight of the white potatoes after the canned product has been allowed to equalize for 15 or more days after the product has been canned.

(b) Method of determining drained weight.

- (1) The drained weight of canned white potatoes is determined by emptying the contents of the container upon a U.S. Standard No. 8 circular sieve (or equivalent) of the proper diameter containing 8 meshes to the inch (0.0937-inch (2.4 mm), (3) percent, square openings) so as to distribute the product evenly. Without shifting the product, incline the sieve to a 17 to 20 degree angle to facilitate drainage and allow to drain for two (2) minutes.
- (2) The drained weight is the weight of the sieve and white potatoes less the weight of the dry sieve. The diameter of the sieve shall be 8 inches (20.3 cm), or equivalent, if the water capacity of the container is less than 3 pounds (1.36 kg), or 12 inches (30.5 cm), or equivalent, if such capacity is 3 pounds (1.36 kg) or more.

(c) Compliance with minimum drained weight values.

Compliance with the minimum drained weight values in Table I is determined by averaging the drained weights from all the containers in the sample which represent a specific lot. Such lot is considered as meeting the minimum drained weight values if the following criteria are met:

- (1)** The sample average (average of all the containers in the sample) meets the minimum average drained weight value (designated as \bar{X}_d) in Table IA); and
- (2)** The number of sample units which fail to meet the minimum drained weight value for individual containers (designated as **LL** in Table I and IA) does not exceed the applicable acceptance number specified in the applicable single sampling plans of the **Regulations Governing Inspection and Certification of Processed Fruits and Vegetables, Processed Products Thereof, and Certain Other Processed Food Products** (7 CFR 52.1 through 52.83).

TABLE I
Minimum Drained Weights for Canned White Potatoes; English (Avoirdupois) System

Container Designation	Container Dimensions ^{1/}	Water Capacity @68°F	Styles									
			Whole		Sliced		Diced		Julienne		Pieces	
			\bar{X}_R (oz)	LL (oz)	\bar{X}_R (oz)	LL (oz)	\bar{X}_R (oz)	LL (oz)	\bar{X}_R (oz)	LL (oz)	\bar{X}_R (oz)	LL (oz)
8Z Tall	211x304	8.65	5.5	4.8	5.5	5.0	5.6	5.1	5.3	4.8	5.5	4.8
No. 300	300x407	15.20	9.2	8.4	9.2	8.5	9.5	8.8	8.4	7.8	9.2	8.4
No. 303	303x406	16.85	10.2	9.3	10.2	9.4	10.5	9.8	9.3	8.6	10.2	9.3
No. 2	307x409	20.50	13.0	11.9	13.3	12.4	13.5	12.7	12.3	11.5	13.0	11.9
No.2-1/2	401x411	29.75	19.0	17.7	19.5	18.4	20.0	19.0	18.3	17.3	19.0	17.7
No. 10	603x700	109.45	74.0	71.5	75.0	73.0	76.0	74.2	72.0	70.2	74.0	71.5

^{1/} The left figure represents the diameter of the container and the right figure the height. The first digit in each number represents whole inches and the second two digits represent fractions in sixteenths of an inch. Thus 303 is three and three-sixteenth inches.

TABLE IA
Minimum Drained Weights for Canned White Potatoes; Metric System (Système International)

Container Designation	Container Dimensions Diameter x Height(mm)	Water Capacity @ 20°C (grams)	Styles									
			Whole		Sliced		Diced		Julienne		Pieces	
			\bar{X}_d (gm)	LL (gm)	\bar{X}_d (gm)	LL (gm)	\bar{X}_d (gm)	LL (gm)	\bar{X}_d (gm)	LL (gm)	\bar{X}_d (gm)	LL (gm)
8Z Tall	68.3x82.6	245.2	155.9	136.1	155.9	141.8	158.8	144.6	150.3	136.1	155.9	136.1
No. 300	76.2x112.7	430.9	260.8	238.1	260.8	241.0	269.3	249.5	238.1	221.1	260.8	238.1
No. 303	81.0x111.1	477.7	289.2	263.7	289.2	266.5	297.7	277.8	263.7	243.8	289.2	263.7
No. 2	87.3x115.9	581.2	368.6	337.4	377.1	351.5	382.7	360.0	348.7	326.0	368.6	337.4
No.2-1/2	103.2x119.1	843.4	538.7	501.8	552.8	521.6	567.0	538.7	518.8	490.5	538.7	501.8
No. 10	157.2x177.8	3102.9	2097.9	2027.0	2126.3	2069.6	2154.6	2103.6	2041.2	1990.2	2097.9	2027.0

§52.1816 Recommended sample unit sizes.

The requirements for size determination and for quality factors other than the defect defined as extraneous vegetable material are based on a recommended sample unit size of 567 g (20.0 oz) of drained product, or the entire drained contents of a container. The recommended sample unit size for extraneous vegetable material is the entire contents of the container.

§52.1817 Size requirements for whole potatoes.

- (a) A lot of canned whole potatoes shall be assigned a single size designation if the applicable requirements of Table II are met.

- (b) A lot of canned whole potatoes that fails the requirements of Table II for a single size designation shall be declared in terms of individual sample unit size designations.

TABLE II
Size Designation of Whole Potatoes

Word Designation	Number Designation	In a 567 g (20.0 oz) Sample Unit	One or more Sample Unit(s) may fall in:
Tiny	Size 1	At least 453.6 g (16.0 oz)--80% are not more than 25 mm (0.98 in) in diameter. 113.4 g (4.0 oz)--20% may have a diameter of more than 25 mm (0.98 in) but not more than 38 mm (1.49 in).	The next larger designation--small (size 2), provided these sample units do not exceed the acceptance number in TABLE II-A below.
Small	Size 2	At least 453.6 g (16.0 oz)--80% have a diameter of more than 25 mm (0.98 in) but not more than 38 mm (1.49 in). 56.7 g (2.0 oz)--10% may have a diameter of 25 mm (0.98 in) or less. 56.7 g (2.0 oz)--10% may have a diameter more than 38 mm (1.49 in) but not more than 51 mm (2.0 in).	The next smaller designation--tiny (size 1), the next larger designation--medium (size 3) or a combination thereof, provided these sample units do not exceed the acceptance number in TABLE II-A below.
Medium	Size 3	At least 453.6 g (16.0 oz) --80% have a diameter of more than 38 mm (1.49 in) but not more than 51 mm (2.0 in). 56.7 g (2.0 oz)--10% may have a diameter of more than 25 mm (0.98 in) but not more than 38 mm (1.49 in). 56.7 g (2.0 oz)--10% may have a diameter of more than 51 mm (2.0 in).	The next smaller designation--small (size 2), the next larger designation--large (size 4) or a combination thereof, provided these sample units do not exceed the acceptance number in TABLE II-A below.
Large	Size 4	At least 510.3 g (18.0 oz)--90% have a diameter of more than 51 mm (2.00 in). 56.7 g (2.0 oz)--10% may have a diameter of more than 30 mm (1.49 in) but not more than 51 mm (2.0 in).	The next smaller designation --medium (size 3), provided these sample units do not exceed the acceptance number in TABLE II-A below.

TABLE II-A

Number of Sample Units	3	6	13	21	29
Acceptance Number	0	1	2	3	4

§52.1818 Grades.

- (a) **U.S. Grade A** is the quality of canned white potatoes that meets the applicable requirements of Tables III through VII and scores not less than 90 points.
- (b) **U.S. Grade B** is the quality of canned white potatoes that meets the applicable requirements of Table III through VII and scores not less than 80 points.
- (c) **Substandard** is the quality of canned white potatoes that fails to meet the requirements for U.S. Grade B.

§52.1819 Factors of quality.

The grade of a lot of canned white potatoes is based on the following quality factors:

- (a) **Color;**
- (b) **Uniformity of size and shape;**
- (c) **Defects;**
- (d) **Texture;**
- (e) **Flavor and odor.**

§52.1820 Requirements for grades.

**TABLE III
Whole Style**

Quality Factors 1/	Grade A 2/	Grade B 3/
Flavor & Odor:	Good	Reasonably good
Color:	Good	Reasonably Good
Score	18 - 20 points	16 - 17 points
Uniformity of size & shape:	Practically uniform	Reasonably uniform
In the 90 percent (by count) most uniform units, the weight of the largest unit is not more than:	3.0 times the weight of the smallest unit	4.0 times the weight of the smallest unit
Score	18 - 20 points	16 - 17 points
Defects:	Practically free	Reasonably free
Mechanical damage, seriously blemished and blemished. Maximum:	113.4 g (4.0 oz) 4/	170.1 g (6.0 oz) 4/
Seriously blemished and blemished. Maximum:	56.7 g (2.0 oz) 4/	113.4 g (4.0 oz) 4/
Seriously blemished. Maximum:	28.4 g (1.0 oz) 4/	56.7 g (2.0 oz) 4/
Extraneous vegetable material (EVM)	1 piece/1.7 kg (60.0 oz) net wt. (sample average)	3 pieces/1.7 kg (60.0 oz) net wt. (sample average)
Sand, grit, or silt.	None	Trace
Score	27 - 30 points	24 - 26 points
Texture:	Good	Reasonably good
Score	27 - 30 points	24 - 26 points
Total Score:	90 - 100 points	80 - 89 points

- 1/ All quality factors except EVM are based on a sample unit size of 567 g (20.0 oz)
- 2/ Can be reasonably uniform in size and shape if total score is 90 points or more.
- 3/ Can fail requirements for reasonably uniform size and shape if total score is 80 points or more.
- 4/ Or 1 unit provided the lot average does not exceed the prescribed requirement.

**TABLE IV
Sliced Style**

Quality Factors 1/	Grade A 2/	Grade B 3/
Flavor & Odor:	Good	Reasonably good
Color:	Good	Reasonably good
Score	18 - 20 points	16 - 17 points
Uniformity of size & shape:	Practically uniform	Reasonably uniform
Maximum thickness:	19 mm (0.74 in)	25 mm (0.98 in)
The diameter of the largest slice is not more than:	1.5 times the diameter of the second smallest slice	2.0 times the diameter of the second smallest slice
Score	18 - 20 points	16 - 17 points
Defects:	Practically free	Reasonably free
Mechanical damage, seriously blemished & blemished. Maximum:	85 g (3.0 oz)	127.6 g (4.5 oz)
Seriously blemished & blemished. Maximum:	56.7 g (2.0 oz)	85 g (3.0 oz)
Seriously blemished. Maximum:	14.2 g (0.5 oz)	28.4 g (1.0 oz)
Extraneous vegetable material. (EVM)	1 piece/1.7 kg (60.0 oz) net wt. (sample average)	3 pieces/1.7 kg (60.0 oz) net wt. (sample average)
Sand, grit or silt.	None	Trace
Score	27 - 30 points	24 - 26 points
Texture:	Good	Reasonably good
Score	27 - 30 points	24 - 26 points
Total Score:	90 - 100 points	80 - 89 points

1/ All quality factors except EVM are based on a sample unit size of 567 g (20.0 oz).

2/ Can be reasonably uniform in size and shape if total score is 90 points or more.

3/ Can fail requirements for reasonably uniform size and shape if total score is 80 points or more.

**TABLE V
Diced Style**

Quality Factors 1/	Grade A 2/	Grade B 3/
Flavor & Odor:	Good	Reasonably good
Color:	Good	Reasonably good
Score	18 - 20 points	16 - 17 points
Uniformity of size & shape:	Practically Uniform	Reasonably uniform
Maximum allowance for irregular shaped units and units that are noticeably larger or smaller than the prevalent cube size:	56.7 g (2.0 oz)	141.8 g (5.0 oz)
Score	18 - 20 points	16 - 17 points
Defects:	Practically free	Reasonably free
Mechanical damage, seriously blemished & blemished. Maximum:	56.7 g (2.0 oz)	85 g (3.0 oz)
Seriously blemished & blemished. Maximum:	22.7 g (0.8 oz)	34 g (1.2 oz)
Seriously blemished. Maximum:	5.7 g (0.2 oz)	11.3 g (0.4 oz)
Extraneous vegetable material. (EVM)	1 piece/1.7 kg (60.0 oz) net wt. (sample average)	3 pieces/1.7 kg (60.0 oz) net wt. (sample average)
Sand, grit or silt.	None	Trace
Score	27 - 30 points	24 - 26 points
Texture:	Good	Reasonably good
Score	27 - 30 points	24 - 26 points
Total Score:	90 - 100 points	80 - 89 points

- 1/ All quality factors except EVM are based on a sample unit size of 567 g (20.0 oz).
- 2/ Can be reasonably uniform in size and shape if total score is 90 points or more.
- 3/ Can fail requirements for reasonably uniform size and shape if total score is 80 points or more.

**TABLE VI
French Style**

Quality Factors 1/	Grade A 2/	Grade B 3/
Flavor & Odor:	Good	Reasonably good
Color:	Good	Reasonably good
Score	18 - 20 points	16 - 17 points
Uniformity of size & shape:	Practically Uniform	Reasonably uniform
Allowance for units less than 13 mm (0.51 in) in length:	56.7 g (2.0 oz)	141.8 g (5.0 oz)
Score	18 - 20 points	16 - 17 points
Defects:	Practically free	Reasonably free
Mechanical damage, seriously blemished & blemished. Maximum:	56.7 g (2.0 oz)	85 g (3.0 oz)
Seriously blemished & blemished. Maximum:	22.7 g (0.8 oz)	34 g (1.2 oz)
Seriously blemished. Maximum:	5.7 g (0.2 oz)	11.3 g (0.4 oz)
Extraneous vegetable material. (EVM)	1 piece/1.7 kg (60.0 oz) net wt. (sample average)	3 pieces/1.7 kg (60.0 oz) net wt. (sample average)
Sand, grit or silt.	None	Trace
Score	27 - 30 points	24 - 26 points
Texture:	Good	Reasonably good
Score	27 - 30 points	24 - 26 points
Total Score:	90 - 100 points	80 - 89 points

1/ All quality factors except EVM are based on a sample unit size of 567 g (20.0 oz).

2/ Can be reasonably uniform in size and shape if total score is 90 points or more.

3/ Can fail requirements for reasonably uniform size and shape if total score is 80 points or more.

**TABLE VII
Pieces**

Quality Factors 1/	Grade A 2/	Grade B 3/
Flavor & Odor:	Good	Reasonably good
Color:	Good	Reasonably good
Score	18 - 20 points	16 - 17 points
Uniformity of size & shape:	Practically Uniform	Reasonably uniform
Maximum allowance for units weighing less than 7.1 g (0.25 oz):	28.4 g (1.0 oz)	56.7 g (2.0 oz)
Of those units weighing 7.1 g (0.25 oz) or more, the weight of the largest unit is not more than:	2.0 times the weight of the second smallest unit	4.0 times the weight of the second smallest unit
Score	18 - 20 points	16 - 17 points
Defects:	Practically free	Reasonably free
Mechanical damage, seriously blemished & blemished. Maximum:	85 g (3.0 oz)	127.6 g (4.5 oz)
Seriously blemished & blemished. Maximum:	57.6 g (2.0 oz)	85 g (3.0 oz)
Seriously blemished. Maximum:	14.2 g (0.5 oz)	28.4 g (1.0 oz)
Extraneous vegetable material. (EVM)	1 piece/1.7 kg (60.0 oz) net wt. (sample average)	3 pieces/1.7 kg (60.0 oz) net wt. (sample average)
Sand, grit or silt.	None	Trace
Score	27 - 30 points	24 - 26 points
Texture:	Good	Reasonably good
Score	27 - 30 points	24 - 26 points
Total Score:	90 - 100 points	80 - 89 points

1/ All quality factors except EVM are based on a sample unit size of 567 g (20.0 oz).

2/ Can be reasonably uniform in size and shape if total score is 90 points or more.

3/ Can fail requirements for reasonably uniform size and shape if total score is 80 points or more.

§52.1821 Determining the grade of a lot.

The grade of a lot of canned white potatoes covered by these standards is determined by the procedures found in the **Regulations Governing Inspection and Certification of Processed Fruits and Vegetables, Processed Products Thereof, and Certain Other Processed Food Products** (7 CFR 52.1 through 52.83).

Dated: August 1, 1998.

/s/
Robert C. Keeney
Deputy Administrator
Fruit and Vegetable Programs