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Division

United States Standards for Grades of Canned Leafy Greens

Effective January 20, 2017

This issue of the United States Standards for Grades of Canned Leafy Greens (81 FR 93572) supersedes the previous issue which has been in effect since September 1, 1973.

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 fresh and processed fruits, vegetables, and specialty crops 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 U.S. grade standards and inspection instructions for all fresh and processed fruits, vegetables, and specialty crops are available on the internet and upon request at the address below. These documents provide detailed interpretations of the grade standards and provide step-by-step procedures for grading the product.

Grade standards are issued by the U.S. Department of Agriculture (USDA) after careful consideration of all data and views submitted during rulemaking. The Department welcomes suggestions for improving the standards in future revisions. Comments may be submitted to, and copies of standards and inspection instructions obtained from:

Director, Specialty Crops Inspection Division
Specialty Crops Program,
USDA, Agricultural Marketing Service
1400 Independence Avenue, SW, STOP 0240
Washington, D.C. 20250

Authority: 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.

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United States Standards for Grades of Canned Leafy Greens

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Product Description

§52.6081 Product description.

Canned Leafy Greens (other than spinach), means the product properly prepared from the succulent leaves of any one of the plants listed under §52.6082 Types and packed with the addition of water in hermetically sealed containers and sufficiently processed by heat to prevent spoilage. The products may be acidified and/or seasoned with one or more of the acidifying or seasoning ingredients and in a quantity permitted under the Federal Food, Drug, and Cosmetic Act.

Types, Styles, and Grades

§52.6082 Types.

- (a) The following types are defined under the Standards of Identity for Canned Vegetables (21 CFR 155.200) issued pursuant to the Federal Food, Drug, and Cosmetic Act:
- (1) Collards.
 - (2) Kale.
 - (3) Mustard Greens.
 - (4) Turnip greens.
- (b) Other types included in this subpart, but not covered by the Standards of Identity for Canned Vegetables are:
- (1) **Mixed leafy greens** – consists of a substantial mixture of any two of the types listed in paragraph (a) of this section.
 - (2) **Poke salad** – consists of leaves and adjoining stem of the pokeberry plant (*Phytolacca Americana*).

§52.6083 Styles.

- (a) **Whole leaf** consists substantially of the whole leaf and adjoining portion of stem.
- (b) **Cut or sliced** consists of the leaves and adjoining portion of stem that has been cut predominantly into large pieces approximating 3/4 inch or more in the longest dimension or cut predominantly into approximate strips.
- (c) **Chopped** consists of the leaves and adjoining portions of the stem that have been cut predominantly into small pieces less than approximately 3/4 inch in the longest dimension.

§52.6084 Grades.

- (a) **U.S. Grade A** is the quality of the product that has a good flavor and odor characteristic of the type and has an attractive appearance and eating quality within the limitations as specified in the subpart with respect to:
- (1) Color.
 - (2) Character.
 - (3) Damage.
 - (4) Harmless extraneous material.
- (b) **U.S. Grade B** is the quality of the product that has a good flavor and odor characteristic of the type and has a reasonably attractive appearance and eating quality within the limitations as specified in the subpart with respect to:
- (1) Color.
 - (2) Character.
 - (3) Damage.
 - (4) Harmless extraneous material.
- (c) **Substandard** is the quality of the product that fails to meet the requirements for U.S. Grade B.

Definitions of Terms and Symbols

§52.6085 Definitions of terms and symbols.

- (a) **Terms.**
- (1) **Defect.** Any specifically defined variation from a particular requirement.
 - (2) **Deviant.** A sample unit that exceeds an upper limit (such as for various defect classifications) or fails to meet a lower limit (such as drained weights).
 - (3) **Sample.** Any number of sample units to be used for inspection of a lot.
 - (4) **Sample unit.** The entire contents of a container, a portion of the contents of a container, or a combination of the contents of two or more containers as specified to be used for inspection.

- (5) **Sample average value.** The numerical value calculated by dividing the total number of applicable defects in a sample by the total number of sample units in that sample.

(b) **Symbols.**

- (1) \bar{X}_d – Minimum sample average drained weight.
- (2) **LL** – Lower limit for individual drained weights.
- (3) **UL** – Upper limit is the value which represents the maximum number of defects a sample unit may have for a grade classification.

Fill of Container

§52.6086 Recommended fill of container.

The recommended 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 purpose of these grades. The recommended fill of container for canned leafy greens is the maximum amount of product that can be sealed in a container and processed by heat to a point of proper sterilization without impairment of quality. It is recommended that the product and packing medium occupy not less than 90 percent of the water capacity of the container.

§52.6087 Recommended drained weights.

- (a) **General.** The recommended drained weight values in Table I of this subpart are not incorporated in the grades of the finished product, since drained weight, as such, is not a factor of quality for the purpose of these grades.
- (b) **Method for ascertaining drained weight.**
- (1) The drained weight of canned leafy greens is determined when the product is at approximately room temperature (68°F.). The contents of the containers are emptied upon a dry, previously weighed U.S. Standard No.8 circular sieve of proper diameter containing 8 meshes to the inch (0.0937, ±3 percent, square openings). With the sieve flat on the tray, the container of product is placed open end down in the sieve in an upright position. The container is lifted off the product without spreading the product out on the sieve. The product is allowed to drain for exactly two minutes. The weight of the product and sieve minus the weight of the dry sieve is the drained weight of the product.

- (2) A sieve 8 inches in diameter is used for the equivalent of a No. 3 size can (404 x 700) and smaller and a sieve 12 inches in diameter is used for containers larger than the equivalent of a No. 3 size can.

Table I
Recommended Minimum Drained Weights for Canned Leafy Greens

Container designation (metal, unless otherwise stated)	Container size overall dimensions		Capacity - weight H ₂ O at 68° F. (avoirdupois ounces)	Minimum drained weight (avoirdupois ounces)	
	Diameter (inches)	Height (inches)			
8Z tall	2-11/16	3-4/16	8.65	4.8	5.2
No. 1 picnic	2-11/16	4	10.90	6.3	6.8
No. 300	3	4-7/16	15.20	8.6	9.1
No. 1 Tall	3-1/16	4-11/16	16.60	9.4	10.0
No. 303	3-3/16	4-6/16	16.85	9.6	10.2
No. 303 glass	--	--	17.70	9.4	10.0
No. 2	3-7/16	4-9/16	20.50	11.9	12.6
No. 2 1/2	4-1/16	4-11/16	29.75	17.6	18.6
No. 2 1/2 glass	--	--	29.50	15.8	16.6
No. 10	6-3/16	7	109.45	54.7	58.4

Factors of Quality and Sample Unit Size
§52.6088 Factors of quality.

The grade of a lot of canned leafy greens is based on requirements for product characteristics with respect to the following quality factors:

- (a) Flavor and odor.
- (b) Color.
- (c) Character.
- (d) Damage.
- (e) Harmless extraneous material.

§52.6089 Sample unit size.

- (a) Compliance with the factors of flavor and odor, color, and character may be determined on:
 - (1) The contents of an entire container, or
 - (2) A representative subsample from containers yielding more than 10 ounces of drained weight.
- (b) Compliance with requirements for harmless extraneous material other than plant material is determined on the contents of an entire container.
- (c) Compliance with requirements for the factors of damage and extraneous plant material shall be determined on subsamples as specified on Table II of this subpart.

Table II – Sample Unit Size

Style	Containers smaller than No. 2 1/2 (drained leafy greens)	No. 2 1/2 Containers (drained leafy greens)	No. 10 Containers (drained leafy greens)
Whole leaf; cut leaf	10 ounces	15 ounces	30 ounces
Chopped	2 ounces	3 ounces	6 ounces

Product Characteristics

§52.6090 Classification of defects.

- (a) **General.** Scoreable defects in the factors of color, character, extraneous plant material, other extraneous material, and damaged leafy greens are outlined in Tables III, IV, and V.
- (b) **Extraneous plant material** includes root crowns, root stubs, and seed heads of the applicable leafy green plant and harmless grass and weeds of various kinds and texture.
- (c) **Other extraneous material** includes grit, sand, silt, or other earthy material.
- (d) **Damage** includes discoloration or other similar injury on a leaf or stem or portion thereof which damage affects, materially affects, or seriously affects the appearance or eating quality of the portion of leafy green and/or entire product.

- (e) **Degrees of defect classes.** Defects are classified as to minor, major, or severe. Each X mark in Tables III, IV, and V represents one (1) defect.

Table III – Whole Leaf; Cut Leaf; Chopped Styles

Quality Factors	Defects	Minor	Major	Severe
Color	Color appearance is:			
	Adversely affected to a degree that is noticeable		X	
	Adversely affected to a degree that is objectionable			X
Character	Appearance or eating quality, due to:			
	(1) A mushy texture, disintegration, ragged cutting, or shredded leaves and shredded stems, or portions thereof; and/or			
	(2) A tough texture, course, or fibrous stems or portions thereof; and/or			
Extraneous Plant Material	Root Crown:			
	Any significant portion of the solid area of the plant between the root and attached leaves		X	
	Root Stub:			
Other Extraneous Material	Any portion of the root whether or not the leaves are attached			X
	Seed Head – Whole leaf, Cut Leaf Styles			
	Longer than one (1) inch or objectionable regardless of length		X	
	Seed head – Chopped Style			
	Pieces affecting appearance or eating quality-			
	More than slightly but not materially	X		
	Materially		X	
Seriously			X	
Other Extraneous Material	Grit, sand, silt, or other earthly material:			
	A trace that no more than slightly affects appearance or eating quality		X	
	Presence materially affects appearance or eating quality			X

**Table IV – Whole Leaf; Cut Leaf; Chopped Styles
Grass and Weeds (Aggregate Measurement)**

Quality Factors	Defects	Minor	Major	Severe
Extraneous Plant Material	Whole Leaf and Cut Leaf Styles			
	Green, fine, tender, string like blades, and stems:			
	3 inches or less	X		
	More than 3 inches but not more than 8 inches		X	
	More than 8 inches			X
	Green and Coarse:			
	1/2 inch or less	X		
	More than 1/2 inch but not more than 2 inches		X	
	More than 2 inches			X
	Other than green – of any texture or kind:			
	1/2 inch or less		X	
	More than 1/2 inch			X
	Chopped Style			
	Green, fine, tender, string-like blades, and stems:			
	3/4 inch or less	X		
	More than 3/4 inch but not more than 2 inches		X	
	More than 2 inches			X
	Green and Coarse:			
	3/4 inch or less		X	
	More than 3/4 inch			X
	Other than green – of any texture or kind:			
Any amount			X	

**Table V – Discolorations or Other Injury
(Affecting the appearance or Eating Quality)**

Quality Factors	Defects	Minor	Major	Severe
Damage	Whole Leaf and Cut Leaf Styles			
	Less than 1 square inch that more than slightly but not materially affects	X		
	Less than 1 square inch that materially affects		X	
	1 square inch or more but less than 4 square inches that affects to any degree		X	
	More than 4 square inches that affects to any degree			X
	Chopped Style			
	Any area that materially affects	X		

§52.6091 Tolerances for Defects

Table VI (a) – Whole Leaf and Cut Leaf Styles

For container sizes: less than No. 2-1/2; sample unit size - 10 ounces		Number of defects permitted in a sample unit		
Grade Classification	Defect Classification	Upper Limit (UL)	Maximum allowed for deviants	Sample average value
U.S. Grade A	Severe	1	2	0.25
	Major	4	6	1.50
	Total ¹	8	11	4.0
U.S. Grade B	Severe	2	3	0.50
	Major	8	11	4.0
	Total ¹	18	23	12.0

¹ **Total** – the sum of severe, major, and minor defects.

Table VI (b) – Whole Leaf and Cut Leaf Styles

For container sizes: less than No. 2-1/2; sample unit size - 15 ounces		Number of defects permitted in a sample unit		
Grade Classification	Defect Classification	Upper Limit (UL)	Maximum allowed for deviants	Sample average value
U.S. Grade A	Severe	1	3	0.375
	Major	5	8	2.25
	Total ¹	10	14	6.0
U.S. Grade B	Severe	2	4	0.75
	Major	10	14	6.0
	Total ¹	26	32	18.0

¹ Total – the sum of severe, major, and minor defects.

Table VI (c) – Whole Leaf and Cut Leaf Styles

For container sizes: less than No. 10; sample unit size - 30 ounces		Number of defects permitted in a sample unit		
Grade Classification	Defect Classification	Upper Limit (UL)	Maximum allowed for deviants	Sample average value
U.S. Grade A	Severe	2	4	0.75
	Major	8	12	4.5
	Total ¹	18	23	12.0
U.S. Grade B	Severe	4	6	1.5
	Major	18	23	12.0
	Total ¹	47	55	36.0

¹ Total – the sum of severe, major, and minor defects.

Table VII (a) – Chopped Style

For container sizes: less than No. 2-1/2; sample unit size - 2 ounces		Number of defects permitted in a sample unit		
Grade Classification	Defect Classification	Upper Limit (UL)	Maximum allowed for deviants	Sample average value
U.S. Grade A	Severe	1	2	0.25
	Major	4	6	1.50
	Minor (grass and weeds)	4	7	2.0
	Total ¹	22	27	15.0
U.S. Grade B	Severe	2	3	0.50
	Major	8	11	4.0
	Minor (grass and weeds)	10	14	6.0
	Total ¹	51	59	40.0

¹ Total – the sum of severe, major, and minor grass, weeds, and other minor defects.

Table VII (b) – Chopped Style

For container sizes: less than No. 2-1/2; sample unit size - 3 ounces		Number of defects permitted in a sample unit		
Grade Classification	Defect Classification	Upper Limit (UL)	Maximum allowed for deviants	Sample average value
U.S. Grade A	Severe	1	3	0.375
	Major	5	8	2.25
	Minor (grass and weeds)	6	9	3.0
	Total ¹	31	38	22.5
U.S. Grade B	Severe	2	4	0.75
	Major	10	14	6.0
	Minor (grass and weeds)	14	14	9.0
	Total ¹	74	85	60.0

¹ Total – the sum of severe, major, and minor grass, weeds, and other minor defects.

Table VII (c) – Chopped Style

For container sizes: less than No. 10; sample unit size - 6 ounces		Number of defects permitted in a sample unit		
Grade Classification	Defect Classification	Upper Limit (UL)	Maximum allowed for deviants	Sample average value
U.S. Grade A	Severe	2	4	0.75
	Major	8	12	4.5
	Minor (grass and weeds)	10	14	6.0
	Total ¹	57	66	45.0
U.S. Grade B	Severe	4	6	1.50
	Major	18	23	12.0
	Minor (grass and weeds)	26	32	18.0
	Total ¹	140	153	120.0

¹ Total – the sum of severe, major, and minor grass, weeds, and other minor defects.

Lot Acceptance

§52.6092 Lot acceptance for drained weights.

A lot of canned leafy greens is considered as meeting the minimum drained weight when the following criteria are met:

- (a) The average of the drained weights from all the containers in the sample meets the average drained weight in Table I of this subpart (designated as \bar{X}_d); and
- (b) The number of deviants for drained weight do not exceed the applicable acceptance number specified in the single sampling plan in the Regulations Governing Inspection of Processed Fruits, Vegetables, and Related Products (7 CFR 52.1 - 52.83).

§52.6093 Lot acceptance for quality.

A lot of canned leafy greens shall be considered as meeting the quality requirements for the applicable grade when the following criteria are met:

- (a) **Flavor and odor.** All sample units meet the requirements for flavor and odor.

(b) Defects.

- (1)** The number of sample units which exceed the upper limit (UL) for these defects for the applicable grade (deviants), specified in Tables VI(a), VI(b), VI(c), VII(a), VII(b), and VII(c), does not exceed the acceptance number specified for the sample size in the Single Sampling Plan of the Regulations Governing Inspection of Processed Fruits, Vegetables, and Related Products (7 CFR 52.1 - 52.83); and
- (2)** The sample average values for the various defect classifications specified in Tables VI(a), VI(b), VI(c), VII(a), VII(b), and VII(c) are not exceeded.
- (3)** No sample unit exceeds the maximum number of defects allowed for deviants.

Score Sheet
§52.6094 Score sheet for canned leafy greens.

NO., SIZE, AND KIND OF CONTAINER													
LABEL													
CONTAINER MARK OR IDENTIFICATION	PRIMARY												
	CASE												
Net Weight (Ounces)													
Vacuum (Inches)													
Drained Weight (Ounces)													
Sample Unit Number		1			2			3					
Quality Factors		Major	Minor	Severe	Major	Minor	Severe	Major	Minor	Severe			
Color													
Character													
Damage													
Harmless Extrinsic Material	Plant												
	Green, fine												
	Green, course												
	Other												
	Seed head												
	Root crown												
	Root stub												
Other Than Plant													
Total (Each Class)													
Cumulative Total (All Classes)													
FLAVOR AND ODOR	Good												
	Objectionable												
											SAMPLE AVERAGE		
											Major	Minor	Severe