



**United States
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Fruit and
Vegetable
Division

Processed
Products
Branch

United States Standards for Grades of Canned Grapefruit

Effective October 25, 1973

This is the sixth issue of the United States Standards for Grades of Canned Grapefruit published in the **FEDERAL REGISTER** of October 23, 1973 (38 FR 29210) to become effective October 25, 1973. This issue supersedes the fifth issue, which has been in effect since September 23, 1971.

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 GRAPEFRUIT
EFFECTIVE OCTOBER 25, 1973

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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. 1622, 1624).

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.

§52.1141 Identity.

Canned Grapefruit means the canned product prepared from clean, sound, and mature grapefruit (*Citrus paradisi* Macfadyen), as such product is defined in the standards of identity for canned grapefruit (21 CFR 27.90) issued pursuant to the Federal Food, Drug and Cosmetic Act.

§52.1142 Grades.

(a) U.S. Grade A (or U.S. Fancy) is the quality of canned grapefruit that:

- (1)** has an average drained weight of not less than 53 percent of the water capacity of the container, of which not less than 65 percent by weight of the drained grapefruit consists of whole or practically whole segments;
- (2)** has a good color;
- (3)** is practically free from defects;
- (4)** has a good character;
- (5)** has good flavor and odor; and
- (6)** scores not less than 90 points when scored in accordance with the scoring system outlined in this subpart.

(b) U.S. Grade B (or U.S. Choice) is the quality of canned grapefruit that:

- (1)** has an average drained weight of not less than 53 percent of the water capacity of the container, of which not less than 50 percent by weight of the drained grapefruit consists of whole or practically whole segments (sample average);
- (2)** has reasonably good color;
- (3)** is reasonably free from defects;
- (4)** has a reasonably good character;
- (5)** has a reasonably good flavor and odor; and
- (6)** scores not less than 80 points when scored in accordance with the

scoring system outlined in this subpart.

(c) **U.S. Broken** is the quality of canned grapefruit that:

- (1) has an average drained weight of not less than 53 percent of the water capacity of the container, of which less than 50 percent by weight of the drained grapefruit consists of whole or practically whole segments (sample average);
- (2) has at least a reasonably good color;
- (3) is at least reasonably free from defects;
- (4) has at least a reasonably good character;
- (5) has at least a reasonably good flavor and odor; and
- (6) scores not less than 70 points when scored in accordance with the scoring system outlined in this subpart.

(d) **Substandard** is the quality of canned grapefruit that fails to meet the requirements of U.S. Grade B and U.S. Broken.

§52.1143 Liquid media and Brix measurements.

(a) Brix measurement requirements for the liquid media in canned grapefruit are not incorporated in the grades of the finished product since sirup, or any other liquid medium, as such, is not a factor of quality for the purposes of these grades. The designation of liquid packing media and Brix measurements, where applicable, is as follows:

Designation	Brix Measurements
Water	Not applicable
Grapefruit juice	Not applicable
Grapefruit juice and water	Not applicable
Slightly sweetened water	12° or more, but less than 16°
Slightly sweetened grapefruit juice	12° or more, but less than 16°
Sirup	16° or more, but less than 18°
Grapefruit juice sirup	16° or more, but less than 18°
Heavy sirup	18° or more

Heavily sweetened grapefruit juice sirup 18° or more

- (b) The densities of the packing media, as listed in this section, are measured on the refractometer, expressed as percent by weight sucrose (degrees Brix) with correction for temperature to the equivalent at 20° C. (68°F.), but without correction for invert sugars or other substances. The degrees Brix of the packing media may be determined by any other method which gives equivalent results.
- (c) Brix determination is made on the packing media 15 days or more after the grapefruit is canned or on the blended homogenized slurry of the comminuted entire contents of the container if canned for less than 15 days.

§52.1144 Fill of container.

- (a) The fill of container for canned grapefruit 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. It is recommended that each container be filled as full as practicable with grapefruit without impairment of quality.
- (b) Canned grapefruit shall also meet the fill of container requirements as set forth in the regulations of Food and Drug Administration (**21 CFR 27.92**).

§52.1145 Minimum drained weights.

- (a) **General.** The minimum drained weight requirements for the various container sizes are listed in Table I. The drained weight of the grapefruit is not less than 53 percent of the water capacity of the container.
- (b) **Definitions.**
 - (1) Sample average -- average of all the drained weights of the sample containers representing a lot.
 - (2) \bar{x}_d means a specified minimum sample average drained weight.
 - (3) *LL* lower limit for individual container drained weight.

- (c) **Method for ascertaining drained weight.** The drained weight of canned grapefruit is determined by emptying the contents of the container upon a U.S. Standard No. 8 circular sieve of proper diameter containing 8 meshes to the inch (0.0937 inch (2.3 mm), ± 3 percent square openings) so as to distribute the product evenly over the sieve. Without shifting the product, incline the sieve at an angle of 17° to 20° to facilitate drainage and allow to drain for 2 minutes. The weight of drained grapefruit is the weight of the sieve and product less the weight of the dry sieve. A sieve 8 inches in diameter is used if the contents of the container is less than three pounds and a sieve 12 inches in diameter is used if the contents of the container is 3 pounds or more.
- (d) **Compliance with drained weight requirements.** A lot of canned grapefruit is considered as meeting the minimum drained weight requirement when the following criteria are met:
- (1) The sample average meets the specified minimum sample average drained weight (designated as \bar{x}_d in Table I): and
 - (2) The number of containers which fail to meet the minimum drained weight for individual containers (designated as *LL* in Table I) does not exceed the applicable acceptance number specified in Table II.

Table I - Minimum Drained Weights

Container Designation	\bar{x}_d	<i>LL</i>
	ounces	ounces
8Z (211 X 304)	4.60	4.25
No. 303 (303 X 406)	8.95	8.50
No. 3 Cyl. (404 X 700)	27.40	26.30

Table II - Single Sampling Plans and Acceptance Numbers

Sample Size (No. of sample containers)	3	6	13	21	29	38	48	60
Acceptance numbers	0	1	2	3	4	5	6	7

§52.1146 Sample unit size.

Compliance with requirements for factors of quality is based on a sample unit comprised of the entire contents of one container, irrespective of container size.

§52.1147 Ascertaining the grade of a sample unit.

(a) **General.** The grade of a sample unit of canned grapefruit is ascertained by considering the factor of flavor and odor which is not scored; the ratings for the factors of wholeness, color, defects, and character which are scored; the total score; and the limiting rules which may be applicable.

(b) **Factors rated by score points.** The relative importance of each factor which is scored is expressed numerically on the scale of 100. The maximum number of points that may be given each factor are:

Factors:	Points
Wholeness	25
Color	25
Defects	25
Character	<u>25</u>
Total Score	100

(c) **Definition.**

(1) **Good flavor and odor** means that the product has a distinct and normal flavor and odor typical of canned grapefruit and is free from objectionable flavors and objectionable odors of any kind.

(2) **Reasonably good flavor and odor** means that the product may be lacking in good flavor and odor but is free from objectionable flavors and objectionable odors of any kind.

§52.1148 Ascertaining the rating for the factors which are scored.

The essential variation within each factor which is scored are so described that the value may be ascertained for each factor and expressed numerically. The numerical range within each factor which is scored is inclusive (for example, "23 to 25 points" means 23, 24, or 25 points.)

§52.1149 Wholeness.

(a) General.

- (1)** A **whole segment** means any grapefruit segment that is substantially intact and retains its apparent original conformation.
- (2)** A **practically whole segment** means any portion of a grapefruit segment that is not less than 75 percent of its apparent original size and is not excessively trimmed.

(b) "A" classification. Sample units of canned grapefruit that consist of not less than 65 percent by weight of the drained grapefruit in whole and/or practically whole segments may be give a score of 21 to 25 points.

(c) "B" classification. Sample units of canned grapefruit that consist of less than 65 percent but not less than 40 percent by weight of the drained grapefruit in whole and/or practically whole segments may be given a score of 17 to 20 points. In addition the sample average (average of all sample units representing a lot) shall not be less than 50 percent by weight of whole and/or practically whole segments. Sample units of canned grapefruit that fall into this classification shall not be graded above U.S. Grade B, regardless of the total score for the product. (This is a limiting rule.)

(d) "Broken" classification. Sample units of canned grapefruit that individually consist of less than 40 percent by weight of the drained grapefruit in whole and/or practically whole segments, or average (average of all sample units) is less than 50 percent by weight of the drained grapefruit in whole and/or practically whole segments may be given a score of 0 to 16 points. Sample units of canned grapefruit that fall into this classification shall not be graded above U.S. Broken, regardless of the total score for the product. (This is a limiting rule.)

§52.1150 Color.

(a) "A" classification. Canned grapefruit that has a good color may be given a score of 23 to 25 points. **Good color** means a practically uniform, bright, typical color free from any noticeable tinge of amber.

- (b) **"B" classification.** Canned grapefruit that has reasonably good color may be given a score of 21 or 22 points. Canned grapefruit that falls into this classification shall not be graded above U.S. Grade B, regardless of the total score for the product. (This is a limiting rule.) **Reasonably good color** means fairly bright color which may be variable but is not off color for any reason.
- (c) **"SStd" classification.** Canned grapefruit that fails to meet the requirements in paragraph (b) of this section may be given a score of 0 to 20 points and shall not be graded above Substandard, regardless of the total score for the product. (This is a limiting rule.)

§52.1151 Defects.

- (a) **General.** The factor of defects refers to the degree of freedom from extraneous vegetable material, from seeds, from portions of albedo, from portions of tough membrane, from damage units, and from other similar defects.
 - (1) **Extraneous vegetable material** means leaves, portions of leaves, small pieces of peel, and other similar material that is harmless.
 - (2) **Seed** means any seed or any portion thereof, whether or not fully developed, that measures more than 3/16 inch in any dimension.
 - (3) **Large seed** means any seed or any portion thereof, whether or not fully developed, that measures more than 3/8 inch in any dimension.
 - (4) **Damage unit** means any grapefruit segment or portion thereof that is damaged by lye peeling, by discoloration, or by similar injury or that is otherwise damaged to such an extent that the appearance or eating quality of the unit is materially affected.
- (b) **"A" classification.** Canned grapefruit that is practically free from defects may be given a score of 23 to 25 points. **Practically free from defects** means that:
 - (1) All defects present, whether or not specifically defined or listed in this section, do not more than slightly affect the appearance or edibility of the product; and
 - (2) The defects that may be present in a sample unit and in the entire

sample do not exceed the allowances specified in Table III.

- (c) **"B" classification.** Canned grapefruit that is reasonably free from defects may be given a score of 21 to 22 points. Canned grapefruit that falls into this classification shall not be graded above U.S. Grade B, regardless of the total score for the product. (This is a limiting rule.) **Reasonably free from defects** means that:
- (1) All defects present, whether or not specifically defined or listed in this section, may materially, but not seriously, affect the appearance or edibility of the product; and
 - (2) The defects that may be present in a sample unit and in the entire sample do not exceed the allowances specified in Table IV.
- (d) **"SStd" classification.** Canned grapefruit that fails to meet the requirements of paragraph (c) of this section may be given a score of 0 to 20 points and shall not be graded above Substandard, regardless of the total score for the product. (This a limiting rule.)

**TABLE III - ALLOWANCES FOR DEFECTS IN CANNED GRAPEFRUIT
U.S. GRADE A**

Defects	8Z (211 x 304)		No. 303 (303 x 406)		No. 3 CYL. (404 x 700)	
	Sample Unit	Sample Average	Sample Unit	Sample Average	Sample Unit	Sample Average
Extraneous Vegetable Material	Maximum		Maximum		Maximum	
	1 piece	0.25 piece	1 piece	0.50 piece	1 piece	0.75 piece
Seeds and large seeds	Total of 3 seeds including not more than 1 large seed.	1.6 seeds including not more than 0.4 large seed.	Total of 4 seeds including not more than 2 large seeds.	3.2 seeds including not more than 0.8 large seed.	Total of 10 seeds including not more than 3 large seeds.	.....
Albedo and though membrane	1 Square inch	1/2 Square inch	2 Square inches	1 Square inch	5 Square inches	4 Square inches
Damaged units	1/4 ounce	.....	1/2 ounce	.....	1-1/2 ounces	.....
-TOTAL- All defects specified above and/or any other defects that may be present	Cumulative effect - does not more than slightly affect the appearance or eating quality of the product.					

**TABLE IV - ALLOWANCES FOR DEFECTS IN CANNED GRAPEFRUIT
U.S. GRADE B**

Defects	8Z (211 x 304)		No. 303 (303 x 406)		No. 3 CYL. (404 x 700)	
	Sample Unit	Sample Average	Sample Unit	Sample Average	Sample Unit	Sample Average
Extraneous Vegetable Material	Maximum		Maximum		Maximum	
	2 pieces	0.50 piece	2 pieces	0.75 piece	2 pieces	1 piece
Seeds and large seeds	Total of 6 seeds including not more than 2 large seed.	4.8 seeds including not more than 1.2 large seed.	Total of 12 seeds including not more than 3 large seeds.	9.6 seeds including not more than 2.4 large seed.	Total of 20 seeds including not more than 5 large seeds.	.....
Albedo and though membrane	1 1/2 Square inch	3/4 Square inch	3 Square inches	2 Square inches	7 1/2 Square inches	6 Square inches
Damaged units	3/4 ounce	.....	1 1/2 ounce	.....	4 ounces	.....
-TOTAL- All defects specified above and/or any other defects that may be present	Cumulative effect - may materially, but not seriously, affect the appearance or eating quality of the product.					

§52.1152 Character.

- (a) **General.** The factor of character refers to the structure and condition of the cells of the grapefruit and reflects the maturity of the grapefruit.
- (b) **"A" classification.** Canned grapefruit that has a good character may be given a score of 23 to 25 points. **Good character** means that the grapefruit segments are moderately firm and fleshy; that the segments or portions thereof possess a juicy, cellular structure free from dry cells, or **ricey cells**, or fibrous cells that materially affects the appearance or eating quality of the product.
- (c) **"B" classification.** Canned grapefruit that has a reasonably good character may be given a score of 21 or 22 points. Canned grapefruit that falls into this classification shall not be graded above U.S. Grade B, regardless of the total score for the product. (This is a limiting rule.) **Reasonably good character** means that the grapefruit segments may be affected, but not seriously so, by dry cells, **ricey** cells or fibrous cells that detract from the appearance or eating quality of the product.
- (d) **"SStd" classification.** Canned grapefruit that fails to meet the requirements of paragraph (c) of this section may be given a score of 0 to 20 points and shall not be graded above Substandard, regardless of the total score for the product. (This is a limiting rule.)

§52.1153 Ascertaining the grade of a lot.

The grade of a lot of canned grapefruit covered by these standards is determined by the procedures set forth in the Regulation Governing Inspection and Certification of Processed Fruits and Vegetable, Processed Products Thereof, and Certain Other Processed Food Products (§52.1 through 52.83).

§52.1154 Score sheet for canned grapefruit.

Size and kind of container			
Container mark or identification			
Label			
Net weight (ounces)			
Vacuum (inches)			
Drained weight (ounces)			
Brix measurements			
Sirup designation			
Factors		Score points	
Wholeness	25	"A"	21-25
		"B"	17-20 <u>1/</u>
		"Broken"	0-16 <u>1/</u>
Color	25	"A"	23-25
		"B"	21-22 <u>1/</u>
		"Broken"	21-25 <u>1/</u>
		"SStd"	0-20 <u>1/</u>
Defects	25	"A"	23-25
		"B"	21-22 <u>1/</u>
		"Broken"	21-25 <u>1/</u>
		"SStd"	0-20 <u>1/</u>
Character	<u>25</u>	"A"	23-25
		"B"	21-22 <u>1/</u>
Total Score	100	"Broken"	21-25 <u>1/</u>
		"SStd"	0-20 <u>1/</u>
Flavor and odor --- Good; Reasonable Good			
Grade			

1/ Indicates limiting rule.

Effective date. The revisions to the U.S Standards for Grades of Canned Grapefruit shall be effective October 25, 1973.

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