



**United States
Department of
Agriculture**

**Agricultural
Marketing
Service**

**Fruit and
Vegetable
Division**

**Processed
Products
Branch**

United States Standards for Grades of Sugarcane Sirup

Effective date April 16, 1957

This is the second issue of the United States Standards for Grades of Sugarcane Sirup. These standards were issued by the Department after careful consideration of all data and views submitted.

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:

Chief, Processed Products Branch
Fruit and Vegetable Division, AMS
U.S. Department of Agriculture
P.O. Box 96456, Rm. 0709, So. Bldg.
Washington, D.C. 20090-6456

United States Standards for Grades of Sugarcane Sirup

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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.

§52.3101 Product description.

Sugarcane sirup is the clean, sound liquid product obtained by evaporation the juice of sugarcane without the removal of any of the soluble solids or by dissolving sugarcane concrete in water, and is produced and packed in accordance with good commercial practice.

§52.3102 Types of sugarcane sirup.

The type of sugarcane sirup is not incorporated in the grades of the finished product since the type of sugarcane sirup, as such, is dependent upon the method of preparation and processing and, therefore, is not a factor of quality for the purpose of these grades. Sugarcane sirup may be prepared and processed as one of the following types:

- (a) **Sulfured sugarcane sirup** means sugarcane sirup which is made by the sulfitation process and contains not more than 100 parts per million of sulfur dioxide.
- (b) **Unulfured sugarcane sirup** means sugarcane sirup which is not made by the sulfitation process.
- (c) It is recommended that sugarcane sirup of these types contain not less than 74 percent, by weight, of soluble solids (74° Brix; 39.50° Baume').
- (d) The maximum ash content recommended for the respective type of sugarcane sirup is given in Table No. 1 of this section.

Table No. 1-Recommended Maximum Ash Content for the Respective Type of Sugarcane Sirup

Type of sugarcane sirup:	Ash (percent)
Unulfured	4.5
Sulfured	6.0

§52.3103 Grades of sugarcane sirup.

- (a) **U.S. Grade A or U.S. Fancy** is the quality of sugarcane sirup that possesses a good color; that possesses a good flavor; that is practically free from defects; that is practically clear; and that for those factors which are rated in accordance with the scoring system outlined in this subpart the score is not less than 90 points: **Provided**, that the sugarcane sirup may possess a reasonably good color and may be reasonably clear if the total score is not less than 90 points.

- (b) **U.S. Grade B or U.S. Choice** is the quality of sugarcane sirup that possesses a reasonably good color; that possesses a reasonably good flavor; that is reasonably free from defects; that is reasonably clear; and that scores not less than 80 points when rated in accordance with the scoring system outlined in this subpart.
- (c) **U.S. Grade C or U.S. Standard** is the quality of sugarcane sirup that possesses a fairly good color; that possesses a fairly good flavor; that is fairly free from defects; that is fairly clear; and that scores not less than 70 points when rated in accordance with the scoring system outlined in this subpart.
- (d) **Substandard** is the quality of sugarcane sirup that fails to meet the requirements of U.S. Grade C or U.S. Standard.

§52.3104 Recommended fill of container.

The recommended fill of container is not incorporated in the grades of the 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 with sirup as full as practicable.

§52.3105 Ascertaining the grade.

- (a) **General.** In addition to considering other requirements outlined in the standards, the following quality factors are evaluated in ascertaining the grade of the product:

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

Factors	Points
Color	30
Flavor	30
Defects	20
Clarity	<u>20</u>
Total Score	100

§52.3106 Ascertaining the score for the factors which are rated.

The essential variations within each factor which is rated are so described that the value may be ascertained for each factor and expressed numerically. The numerical range within each factor which is rated is inclusive (for example, **18 to 20 points** means 18, 19, or 20 points).

§52.3107 Color.

- (a) **General.** Color has reference to the color of sugarcane sirup when examined by means of the U.S.D.A. permanent glass color standards for sugarcane sirup. Information regarding these color standards may be obtained by writing to:

Chief, Processed Products Branch
Fruit and Vegetable Division, AMS
U.S. Department of Agriculture
P.O. Box 96456, Rm. 0709, So. Bldg.
Washington, D.C. 20090-6456

- (b) **"A" classification.** Sugarcane sirup that possesses a good color may be given a score of 27 to 30 points. **Good color** means that the color is bright and typical of sirup properly prepared and processed from sound, well matured sugarcane, and is equal to or lighter in color than U.S.D.A. permanent glass color standard No. 1 for sugarcane sirup.
- (c) **"B" classification.** If the sugarcane sirup possesses a reasonably good color, a score of 24 to 26 points may be given. **Reasonably good color** means that the color is reasonably bright, and is equal to or lighter in color than U.S.D.A. permanent glass color standard No. 2 for sugarcane sirup.
- (d) **"C" classification.** Sugarcane sirup that possesses a fairly good color may be given a score of 21 to 23 points. Sugarcane sirup that falls into this classification shall not be graded above U.S. Grade C or U.S. Standard, regardless of the total score for the product (this is a limiting rule). **Fairly good color** means that the sugarcane sirup possesses a color that is equal to or lighter in color than U.S.D.A. permanent glass color standard No. 3 for sugarcane sirup.
- (e) **"SStd" classification.** Sugarcane sirup that fails to meet the requirements of the above 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).

§52.3108 Flavor.

- (a) **General.** The factor of flavor refers to the palatability of the sugarcane sirup and the effect on flavor of the method of preparation for the particular type of sugarcane sirup.

- (b) **"A" classification.** Sugarcane sirup that possesses a good flavor may be given a score of 27 to 30 points. **Good flavor** means that the product possesses a good, characteristic flavor for the type of sugarcane sirup and is free from objectionable flavors including but not limited to, objectionable flavors caused by scorching or fermentation or the presence of any foreign or disagreeable flavor or odor.
- (c) **"B" classification.** If the sugarcane sirup possesses a reasonably good flavor, a score of 24 to 26 points may be given. Sugarcane sirup that falls into this classification shall not be graded above U.S. Grade B or U.S. Choice, regardless of the total score for the product (this is a limiting rule). **Reasonably good flavor** means that the product possesses a reasonably good, characteristic flavor for the type of sugarcane sirup and is free from objectionable flavors, including but not limited to, objectionable flavors caused by scorching or fermentation or the presence of any foreign or disagreeable flavor or odor.
- (d) **"C" classification.** Sugarcane sirup that possesses a fairly good flavor may be given a score of 21 to 23 points. Sugarcane sirup that falls into this classification shall not be graded above U.S. Grade C or U.S. Standard, regardless of the total score for the product (this is a limiting rule). **Fairly good flavor** means that the product possesses a fairly good flavor for the type of sugarcane sirup and is free from objectionable flavors, including but not limited to, objectionable flavors caused by scorching or fermentation or the presence of any foreign or disagreeable flavor or odor.
- (e) **"SStd" classification.** Sugarcane sirup that fails to meet the requirements of the above paragraph (d) 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).

§52.3109 Defects.

- (a) **General.** Defects refers to the cleanliness of the product and the degree of freedom from harmless extraneous material, such as particles of fiber, carbon, or earthy material which may be in suspension or deposited as sediment in the container.
- (b) **"A" classification.** Sugarcane sirup that is practically free from defects may be given a score of 18 to 20 points. **Practically free from defects** means that the appearance and edibility of the product are not affected by the presence of harmless extraneous matter or other material which may be in suspension or deposited as sediment in the container.

- (c) **"B" classification.** If the sugarcane sirup is reasonably free from defects, a score of 16 or 17 points may be given. Sugarcane sirup that falls into this classification shall not be graded above U.S. Grade B or U.S. Choice, regardless of the total score for the product (this is a limiting rule). **Reasonably free from defects** means that the appearance and edibility of the product are not materially affected by the presence of harmless extraneous matter or other material which may be in suspension or deposited as sediment in the container.
- (d) **"C" classification.** Sugarcane sirup that is fairly free from defects may be given a score of 14 or 15 points. Sugarcane sirup that falls into this classification shall not be graded above U.S. Grade C or U.S. Standard, regardless of the total score for the product (this is a limiting rule). **Fairly free from defects** means that the appearance and edibility of the product are not seriously affected by the presence of harmless extraneous matter or other material which may be in suspension or deposited as sediment in the container.
- (e) **"SStd" classification.** Sugarcane sirup that fails to meet the requirements of paragraph (d) of this section may be given a score of 0 to 13 points and shall not be graded above Substandard, regardless of the total score for the product (this is a limiting rule).

§52.3110 Clarity.

- (a) **General.** The factor of clarity has reference to the degree of freedom from fine particles of mineral matter, colloidal or amorphous material, or any other suspended matter that may affect the clarity, appearance, or edibility of the product.
- (b) **"A" classification.** Sugarcane sirup that is practically clear may be given a score of 18 to 20 points. **Practically clear** means that the sugarcane sirup may contain not more than a trace of finely divided particles of suspended material which does not affect the appearance or edibility of the product.
- (c) **"B" classification.** If the sugarcane sirup is reasonably clear a score of 16 or 17 points may be given. **Reasonably clear** means that the sugarcane sirup may contain finely divided particles of suspended material which does not materially affect the appearance or edibility of the product.

- (d) **"C" classification.** Sugarcane sirup that is fairly clear may be given a score of 14 or 15 points. Sugarcane sirup that falls into this classification shall not be graded above U.S. Grade C or U.S. Standard, regardless of the total score for the product (this is a limiting rule). **Fairly clear** means that the appearance or edibility of the sugarcane sirup may be materially but not seriously affected by the presence of finely divided particles of suspended material.
- (e) **"SStd" classification.** Sugarcane sirup that fails to meet the requirements of paragraph (d) of this section may be given a score of 0 to 13 points and shall not be graded above Substandard, regardless of the total score for the product (this is a limiting rule).

§52.3111 Color of sugarcane sirup.

- (a) The color classification of sugarcane sirup is determined by means of the U.S.D.A. permanent glass color standards for sugarcane sirup as outlined in this subpart.
- (b) Partially crystallized sugarcane sirup is liquefied by heating to approximately 54.4° C. (130° F.) and cooled to approximately 20° C. (68° F.) before ascertaining the color of the sirup by means of the U.S.D.A. permanent glass color standards for sugarcane sirup.

§52.3112 Application of U.S.D.A. permanent glass color standards in classifying the color of sugarcane sirup.

- (a) **Sample containers.** The sample containers for use in making the visual color determination, as set forth in this subpart, are cells of colorless optical glass or plastic, having an internal width of 3.175 mm. (1/8 inch) with outside dimensions of approximately 1-7/16 inches by 3-1/2 inches.
- (b) **Comparator; viewing box.** The comparator or viewing box for the entire color range in the visual comparison test is divided into five compartments. Each compartment is provided with openings approximately 1-3/16 inches square in the two parallel sides. The U.S.D.A. permanent glass color standards are mounted in a fixed position in the front openings of compartments 1, 3, and 5 of the comparator, compartments 2 and 4 being adapted to receive the sample containers.
- (c) **Visual comparison test.** The color of a sample of sugarcane sirup is compared with the USDA permanent glass Color Standards in the following manner to determine its color classification:

- (1) Place the sample of sugarcane sirup in a clean, dry sample container.
- (2) Place the container filled with the sample of sugarcane sirup successively in compartments 2 and 4 of the comparator, and visually compare the color of the sample with that of each of the glass color standards by looking through them at a diffuse source of natural or artificial daylight.

§52.3113 Soluble solids; brix value.

Soluble solids means the solids content of sugarcane sirup means the solids content of sugarcane sirup or the Brix value as determined by the double dilution method by means of a Brix hydrometer corrected to 20° C. (68° F.).

§52.3114 Ash.

Percent ash means the ash content of sugarcane sirup determined as sulfated ash as outlined in the Official Agricultural Chemists, Seventh Edition, 1950. Percent ash is calculated on the basis of the percent soluble solids content of the product and expressed as percent of sulfated ash with no deduction.

§52.3115 Sulfur dioxide, P.P.M.

Sulfur Dioxide, P.P.M. means the total sulfites determined by the Monier-Williams method, calculated as parts per million of sulfur dioxide (SO₂).

§52.3116 Reducing sugars.

The percent, by weight, of reducing sugars is calculated on the basis of the percent of soluble solids. Reducing sugars are determined by the Lane-Eynon volumetric method for reducing sugars.

§52.3117 Sucrose.

The percent, by weight, of sucrose is calculated on the basis of the percent of soluble solids. The determination may be made by the Clerget, or double polarization, method using invertase as the inverting agent, by Jackson-Gillis Method Number IV, or by the chemical method, before and after inversion.

§52.3118 Method of analysis.

The analysis indicated in this subpart shall be made in accordance with methods of analysis given in Official Methods of Analysis of the Association of Official Agricultural Chemists or by any other means which given equivalent results.

§52.3119 Ascertaining the grade of a lot.

The grade of a lot of the processed product covered by these standards is determined by the procedures set forth 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 to 52.83).

§52.3120 Score sheet for sugarcane sirup.

Size and kind of container			
Container mark or identification			
Label			
Type			
Soluble solids, percent; Brix (degrees)			
Sucrose, percent			
Reducing sugars, percent			
Ash, percent			
Factors		Score points	
Color	30	"A"	27-30
		"B"	24-26
		"C"	21-23 <u>1/</u>
		"SStd"	0-20 <u>1/</u>
Flavor	30	"A"	27-30
		"B"	24-26 <u>1/</u>
		"C"	21-23 <u>1/</u>
		"SStd"	0-20 <u>1/</u>
Defects	20	"A"	18-20
		"B"	16-17 <u>1/</u>
		"C"	14-15 <u>1/</u>
		"SStd"	0-13 <u>1/</u>
Clarity	20	"A"	18-20
		"B"	16-17
		"C"	14-15 <u>1/</u>
		"SStd"	0-13 <u>1/</u>
Total Score	100		
Normal flavor and odor			
Grade			

1/ Limiting rule.

The United States Standards for Grades of Sugarcane Sirup (which is the second issue) contained in this subpart shall become effective 30 days after publication hereof in the Federal Register, and will thereupon supersede the United States Standards for Grades of Sugarcane Sirup which have been in effect since July 20, 1951.

Dated: March 13, 1957.

[SEAL] Roy W. Lennartson,
Deputy Administrator,
Marketing Services.

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