



**United States
Department of
Agriculture**

**Agricultural
Marketing
Service**

**Fruit and
Vegetable
Division**

**Processed
Products
Branch**

United States Standards for Grades of Sugarcane Molasses

Effective date November 16, 1959

This is the second issue, as amended, of the United States Standards for Grades of Sugarcane Molasses, published in the **FEDERAL REGISTER** of October 19, 1959 (24 FR 8365) to become effective November 16, 1959. This issue supersedes the first issue, which has been in effect since August 11, 1952.

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 Molasses

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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.

§52.3651 Product description.

Sugarcane molasses is the clean, sound, liquid product obtained by evaporating the juice of sugarcane and the removal of all or any part of the commercially crystallizable sugar.

§52.3652 Grades of sugarcane molasses.

- (a) U.S. Grade A (or U.S. Fancy)** is the quality of sugarcane molasses that possesses a good flavor; that meets the requirements for Brix, sugar, ash, and sulfites as outlined in Table I of this subpart; that possesses a good color; that is practically free from defects; and that scores not less than 90 points when rated in accordance with the scoring system outlined in this subpart.
- (b) U.S. Grade B (or U.S. Choice)** is the quality of sugarcane molasses that possesses a reasonably good flavor; that meets the requirements for Brix, sugar, ash, and sulfites as outlined in Table I of this subpart; that possesses a reasonably good color; that is reasonably free from defects; 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 molasses that possesses a fairly good flavor; that meets the requirements for Brix, sugar, ash, and sulfites as outlined in Table I of this subpart; that possesses a fairly good color; that is fairly free from defects; 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 molasses that fails to meet the requirements of U.S. Grade C.

§52.3653 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 molasses as full as practicable.

§52.3654 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 not rated by score points.
- (i) Brix solids.
 - (ii) Total sugar.
 - (iii) Ash.
 - (iv) Total sulfites.
 - (v) Flavor (palatability).
 - a. **Good flavor** means the sugarcane molasses possesses a flavor and odor characteristic of first centrifugal molasses of fancy quality.
 - b. **Reasonably good flavor** means the sugarcane molasses possesses a flavor and odor characteristic of second centrifugal molasses of choice quality.
 - c. **Fairly good flavor** means the sugarcane molasses possesses a flavor and odor characteristic of second centrifugal molasses of standard quality.
- (2) 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 such factor is:

Factors	Points
Color	50
Defects	<u>50</u>
Total sugar	100
.....	

§52.3655 Required Brix solids, total sugar, ash, total sulfites.

The required minimum Brix solids, minimum total sugar, maximum ash content, and maximum total sulfites for the respective grade of sugarcane molasses are given in Table I of this section.

**TABLE I
REQUIRED PERCENT OF MINIMUM
BRIX SOLIDS, TOTAL SUGAR, MAXIMUM ASH AND TOTAL SULFITES**

Grade designation	Brix solids (minimum)		Total sugar (minimum)		Ash (maximum)		Total Sulfites (ppm)
	Average from all containers	Limit for individual container	Average from all containers	Limit for individual container	Average from all containers	Limit for individual container	Average from all containers
Grade A	79.0	78.5	63.5	63.0	5.00	5.25	200
Grade B	79.0	78.5	61.5	61.0	7.00	7.50	250
Grade C	79.0	78.5	58.0	57.0	9.00	10.00	250
SStd	Under 79.0	N/A	Under 58.0	N/A	Over 9.00	N/A	Over 250

§52.3656 Compliance with the required Brix solids and total sugar and maximum ash content.

Lot compliance with the Brix, total sugar, and ash requirements shall be determined separately for each factor, and the acceptance number prescribed in paragraph (c) of this section shall be permitted for each factor. A lot is considered as meeting the Brix, total sugar, and ash requirements for the respective grade as outlined in Table I of this subpart: **Provided**, that

- (a) The average of the Brix and average of the total sugar values are equal to or greater than the applicable **minimum averages** (from all containers) in Table I; and the average of the ash values does not exceed the applicable **maximum average** (from all containers) in Table I; and
- (b) None of the Brix or total sugar values are less than the applicable **minimum limits** (for individual containers) in Table I; and none of the ash values exceed the applicable **maximum limit** (for individual containers) in Table I; and
- (c) The number of Brix values or the number of total sugar values that are less than the applicable **minimum average** but not less than the applicable **minimum limit** of Table I or the number of ash values that are more than the applicable **maximum average** but not more than the **maximum limit** of Table I do not exceed the acceptance number prescribed for the sample size in the indicated sampling plans contained in the regulations, 7 CFR 52.1 through 52.83.

§52.3657 Ascertaining the rating for the factors which are scored.

The essential variations 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, **45 to 50 points** means 45, 46, 47, 48, 49, or 50 points).

§52.3658 Color.

- (a) **General.** Color has reference to the color of sugarcane molasses when examined by means of the USDA permanent glass color standards for sugarcane molasses. 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 molasses that possesses a good color may be given a score of 45 to 50 points. **Good color** means that the color is bright and typical of molasses properly prepared and processed from sound, well matured sugarcane, and is equal to or lighter in color than USDA permanent glass color standard No. 1 for sugarcane molasses.
- (c) **"B" classification.** If the sugarcane molasses possesses a reasonably good color, a score of 40 to 44 points may be given. Sugarcane molasses 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 that the color is reasonably bright and is equal to or lighter in color than USDA permanent glass color standard No. 2 for sugarcane molasses.
- (d) **"C" classification.** Sugarcane molasses that possesses a fairly good color may be given a score of 35 to 39 points. Sugarcane molasses that falls into this classification shall not be graded above U.S. Grade C, regardless of the total score for the product (this is a limiting rule). **Fairly good color** means that the color is equal to or lighter in color than USDA permanent glass color standard No. 3 for sugarcane molasses.
- (e) **"SStd" classification.** Sugarcane molasses that fails to meet the requirements of paragraph (d) of this section may be given a score of 0 to 34 points and shall not be graded above Substandard, regardless of the total score for the product (this is a limiting rule).

§52.3659 Defects.

- (a) **General.** Defects refers to the cleanliness of the product and the degree of freedom from harmless extraneous material.
- (b) **"A" classification.** Sugarcane molasses that is practically free from defects may be given a score of 45 to 50 points. **Practically free from defects** means that the appearance and edibility of the product are not affected by the presence of harmless extraneous material which may be in suspension or deposited as sediment in the container.
- (c) **"B" classification.** If the sugarcane molasses is reasonably free from defects, a score of 40 to 44 points may be given. Sugarcane molasses 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 the appearance and edibility of the product are not materially affected by the presence of harmless extraneous material which may be in suspension or deposited as sediment in the container.
- (d) **"C" classification.** Sugarcane molasses that is fairly free from defects may be given a score of 35 to 39 points. Sugarcane molasses that falls into this classification shall not be graded above U.S. Grade C, 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 material which may be in suspension or deposited as sediment in the container.
- (e) **"SStd" classification.** Sugarcane molasses that fails to meet the requirements of paragraph (d) of this section may be given a score of 0 to 34 points and shall not be graded above Substandard, regardless of the total score for the product (this is a limiting rule).

§52.3660 Methods of analysis.

The analyses in this subpart, unless indicated otherwise, shall be made in accordance with the applicable methods of analyses given in the **Official Methods of Analysis of the Association of Official Analytical Chemists** or by any other means which give equivalent results.

§52.3661 Color of sugarcane molasses.

- (a) The color classification of sugarcane molasses is determined by means of the USDA permanent glass color standards for sugarcane molasses as outlined in this subpart.
- (b) Partially crystallized sugarcane molasses 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 molasses by means of the USDA permanent glass color standards for sugarcane molasses.

§52.3662 Application of USDA permanent glass color standards in classifying the color of sugarcane molasses.

- (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 0.100 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 viewing openings approximately 1-3/16 inches square in the two parallel sides. The USDA 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) **Cloudy suspensions.** Three cloudy suspensions are required. These are referred to as "Cloudy A," "Cloudy B," and "Cloudy C," corresponding to varying degrees of cloudiness in sugarcane molasses. The cloudy suspensions are contained in capped square bottles of colorless, transparent glass having an internal width at the center of 3.15 centimeters (1.24 inches), with outside base dimensions of approximately 1-7/16 inches by 1-7/16 inches, having a capacity of two fluid ounces.
- (d) **Visual comparison test.** The color of a sample of sugarcane molasses is compared with the USDA permanent glass color standards in the following manner to determine its color classification:
 - (1) Place the sample of sugarcane molasses in a clean, dry sample container.

- (2) Place the container filled with the sample 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.
- (3) If the sample is appreciably cloudy in appearance, place a suspension of comparable cloudiness (Cloudy A, Cloudy B, or Cloudy C) behind the permanent glass color standard to facilitate color classification.

§52.3663 Brix solids.

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

§52.3664 Ash.

Percent ash means the ash content of sugarcane molasses determined as sulfated ash.

§52.3665 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).

§52.3666 Reducing sugars.

The percent of reducing sugars is determined by the Lane-Eynon volumetric method for reducing sugars.

§52.3667 Sucrose.

The percent of sucrose is determined by the Clerget or double polarization method, using invertase as the inverting agent.

§52.3668 Total sugar.

The percent of total sugar is the sum of the percent of reducing sugars and the percent of sucrose.

§52.3669 Ascertaining the grade of a lot.

The grade of a lot of sugarcane molasses 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 through 52.83).

§52.3670 Score sheet for sugarcane molasses.

Size and kind of container			
Container mark or identification.			
Label			
Vacuum (inches)			
Volume (liquid measure)			
USDA color			
Brix solids, percent			
Reducing sugars, percent			
Sucrose, percent			
Total sugar, percent			
Ash, percent			
SO ₂ , p.p.m.			
Factors		Score Points	
Color	50	"A"	45-50
		"B"	40-44 <u>1/</u>
		"C"	35-39 <u>1/</u>
		"SStd"	0-34 <u>1/</u>
Defects	<u>50</u>	"A"	45-50
		"B"	40-44 <u>1/</u>
		"C"	35-39 <u>1/</u>
		"SStd"	0-34 <u>1/</u>
Total Score	100		
Flavor: () Good; () Reasonably good; () Fairly good; () Off flavor.			
Grade			

1/ Indicates limiting rule

The United States Standards for Grades of Sugarcane Molasses (which is the second issue) contained in this subpart (7 CFR 52.3651-52.3670) shall become effective 30 days after the date of publication hereof in the FEDERAL REGISTER, and thereupon will supersede the United States Standards for Grades of Edible Sugarcane Molasses (7 CFR 44.1-44.6) which have been in effect since August 11, 1952.

Done at Washington, DC on: October 12, 1959

/s/

Roy W. Lennartson
Deputy Administrator
Marketing Services

FIRST ISSUE

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SECOND ISSUE

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