



**United States
Department of
Agriculture**

**Agricultural
Marketing
Service**

**Fruit and
Vegetable
Division**

**Processed
Products
Branch**

United States Standards for Grades of Tomato Juice

Effective date July 22, 1985

This is the fourth issue of the United States Standards for Grades of Tomato Juice published in the **FEDERAL REGISTER** of July 22, 1985 (50 FR 29635) to become effective July 22, 1985. This issue supersedes the third issue, which has been in effect since June 15, 1978.

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 Tomato Juice

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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.

§52.3621 Product description.

- (a) Tomato juice** is the product as defined in the Standards of Identity for Tomato Juice (21 CFR 156.145), issued under the Federal Food, Drug, and Cosmetic Act.
- (b) Tomato juice from concentrate** is the product as defined in the Standards of Identity for Tomato Juice (21 CFR 156.145), issued under the Federal Food, Drug, and Cosmetic Act.

§52.3622 Definitions of terms.

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

(a) Color.

- (1) General.** The amount of red in tomato juice and tomato juice from concentrate is determined by comparing the color of the product with the Munsell color discs with specified percentages. The availability and procedure for using the Munsell color discs may be obtained from the supplier licensed by the U.S. Department of Agriculture:

Munsell Color Company, Incorporated
P.O. Box 230
Newburgh, New York 12551

Any method or device approved by the USDA (including electronic color meters) which gives equivalent results may be used.

- (2) Good color** means a color that is bright and characteristic of tomato juice, made from mature red tomatoes, which is not affected by caramelization, oxidation or other similar causes. Such color contains as much red as, or more red than, that produced by spinning the specified Munsell color discs in the following combinations or an equivalent of such composite color:

65 percent of the area of Red (5R 2.6/13) (glossy finish);

21 percent of the area of Yellow (2.5 YR 5/12) (glossy finish); and

14 percent of the area of either Black (N1) (glossy finish) or Grey (N4) (mat finish); or

7 percent of the area of Black (N1) (glossy finish) and

7 percent of the area of Grey (N4) (mat finish), whichever most nearly matches the reflectance of the product.

(3) Reasonably good color means a color that is typical of red tomato juice which may be slightly affected by caramelization, oxidation or other similar causes.

(i) To score 25 points for color, the juice shall contain as much red as, or more red than, that produced by spinning the specified Munsell color discs in the following combinations or an equivalent of such composite color:

59 percent of the area of Red (5R 2.6/13) (glossy finish);

24-1/2 percent of the area of Yellow (2.5 YR 5/12) (glossy finish); and

16-1/2 percent of the area of either Black (N1) (glossy finish) or Grey (N4) (mat finish); or

8-1/4 percent of the area of Black (N1) (glossy finish) and

8-1/4 percent of the area of Grey (N4) (mat finish), whichever most nearly matches the reflectance of the product.

(ii) To score 23 or 24 points for color, the juice shall contain as much red as, or more red than, that produced by spinning the specified Munsell color discs in the following combinations or an equivalent of such composite color:

53 percent of the area of Red (5R 2.6/13) (glossy finish);

28 percent of the area of Yellow (2.5 YR 5/12) (glossy finish); and

19 percent of the area of either Black (N1) (glossy finish) or Grey (N4) (mat finish); or

9-1/2 percent of the area of Black (N1) (glossy finish) and

9-1/2 percent of the area of Grey (N4) (mat finish), whichever most nearly matches the reflectance of the product.

- (b) **Consistency** means the viscosity of tomato juice or tomato juice from concentrate including the degree of separation of the insoluble solids.
 - (1) **Good consistency** means that the juice flows readily; has a normal amount of insoluble tomato solids in suspension; and that there is little solids separation.
 - (2) **Reasonably good consistency** means that the juice flows readily; has a normal amount of insoluble tomato solids in suspension; and that there is not a marked degree of solids separation.
- (c) **Defects** means dark specks or scale-like particles, seeds, particles of seed, tomato peel, core material, or other similar substances.
 - (1) **Practically free from defects** means that any defects present do not more than slightly affect the appearance or drinking quality of the product.
 - (2) **Reasonably free from defects** means that any defects present may be noticeable, but are not so large, so numerous, or of such contrasting color as to seriously affect the appearance or drinking quality of the product.
- (d) **Flavor** is evaluated based upon characteristics normal to tomato juice or tomato juice from concentrate.
 - (1) **Good flavor** means a distinct tomato juice flavor and odor characteristic of good quality tomatoes which is not materially affected by stems, leaves, crushed seeds, cores, immature tomatoes, or the effects of improper trimming or processing.
 - (2) **Reasonably good flavor** means a characteristic tomato juice flavor which may be materially, but not seriously, affected by stems, leaves, crushed seeds, cores, immature tomatoes, or the effects of improper trimming or processing.
- (e) **Tomato soluble solids (TSS)** means the sucrose value as determined by the method prescribed in 21 CFR 156.3.

§52.3623 Recommended sample unit sizes.

The requirements for all factors of quality are based on the following:

- (a) The entire contents of a container;
- (b) A representative portion of the contents of a container;
- (c) A combination of the contents of two or more containers; or
- (d) A representative portion of processed product stored or held in bulk containers.

§52.3624 Grades.

- (a) **U.S. Grade A** is the quality of tomato juice or tomato juice from concentrate that meets the applicable requirements of Tables I or II.
- (b) **U.S. Grade B** is the quality of tomato juice or tomato juice from concentrate that meets the applicable requirements of Tables I or II.
- (c) **Substandard** is the quality of tomato juice or tomato juice from concentrate that fails to meet the requirements for "U.S. Grade B."

§52.3625 Recommended fill of container.

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. It is recommended that each container of tomato juice be filled as full as practicable without impairment of quality, and that the product occupies not less than 90 percent of the capacity of the container.

§52.3626 Factors of quality and analysis.

- (a) The grade of a lot of tomato juice or tomato juice from concentrate is based on evaluation and analysis of the juice for the following quality and analytical factors:
 - (1) Color;
 - (2) Consistency;
 - (3) Defects;
 - (4) Flavor; and
 - (5) Tomato soluble solids (tomato juice from concentrate).

(b) The relative importance of each quality factor is expressed numerically on the scale of 100. The maximum number of points that may be given each factor is:

Factors	Points
Color	30
Consistency	15
Defects	15
Flavor	<u>40</u>
Total Score	100

(c) The essential variations within each factor are so described that the value may be determined for each factor and expressed numerically. The numerical range for the rating of each factor is inclusive (for example, **13 to 15** points means 13, 14, or 15 points) and the score points shall be prorated relative to the degree of excellence for each factor.

§52.3627 Requirements for grades.

TABLE I
Tomato Juice

QUALITY FACTORS	FACTOR DESCRIPTION	GRADE	SCORE POINT RANGE
Color	Good	A	26-30
	Reasonably Good	B	25 <u>1/</u> 23-24 <u>2/</u>
Consistency	Good	A	13-15
	Reasonably good	B	10-12 <u>3/</u>
Defects	Practically free	A	13-15
	Reasonably free	B	10-12 <u>4/</u>
Flavor	Good	A	33-40
	Reasonably good	B	27-32 <u>4/</u>
MINIMUM TOTAL SCORE		A	85 points
		B	70 points

- 1/ Tomato juice assigned 25 points for the factor of color can be graded U.S. Grade A, provided all other requirements for U.S. Grade A are met and that the total score for the product is not less than 85 points.
- 2/ Tomato juice assigned 23 or 24 points for the factor of color cannot be graded above U.S. Grade B regardless of the total score for the product.
- 3/ Tomato juice possessing only "reasonably good consistency" (10-12 points) can be graded U.S. Grade A, provided all other requirements for U.S. Grade A are met and that the total score for the product is not less than 85 points.
- 4/ Cannot be graded U.S. Grade B regardless of the total score for the product.

Table II
Tomato Juice from Concentrate

QUALITY FACTORS	FACTOR DESCRIPTION	GRADE	SCORE POINT RANGE
Color	Good	A	26-30
	Reasonably Good	B	25 <u>1/</u> 23-24 <u>2/</u>
Consistency	Good	A	13-15
	Reasonably good	B	10-12 <u>3/</u>
Defects	Practically free	A	13-15
	Reasonably free	B	10-12 <u>4/</u>
Flavor	Good	A	33-40
	Reasonably good	B	27-32 <u>4/</u>
MINIMUM TOTAL SCORE		A	85 points
		B	70 points
Tomato Soluble Solids (Minimum)		5.0 percent by weight	

- 1/ Tomato juice from concentrate assigned 25 points for the factor of color can be graded U.S. Grade A, provided all other requirements for U.S. Grade A are met and that the total score for the product is not less than 85 points.
- 2/ Tomato juice from concentrate assigned 23 or 24 points for the factor of color cannot be graded above U.S. Grade B regardless of the total score for the product.
- 3/ Tomato juice from concentrate possessing only **reasonably good consistency** (10-12 points) can be graded U.S. Grade A, provided all other requirements for U.S. Grade A are met and that the total score for the product is not less than 85 points.
- 4/ Cannot be graded above U.S. Grade B regardless of the total score for the product.

§52.3628 Sample size.

The sample size used to determine whether the requirements of these standards are met shall be as specified in the sampling plans and procedures 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) for lot grading and on-line grading, as applicable.

§52.3629 Lot quality requirements.

A lot of tomato juice or tomato juice from concentrate is considered as meeting the requirements for quality if:

- (a) The requirements specified in Table I or II, as applicable, are met; and
- (b) The sampling plans and procedures in 7 CFR 52.1 - 52.83 are met.

Done at Washington, D.C., on: July 16, 1985

/s/

William T. Manley
Deputy Administrator
Marketing Programs