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Proposed United States Standards for Grades of Frozen Onions

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**Information about this document may be obtained from:
Chere L. Shorter, Standardization Section
Processed Products Branch
STOP 0247, 1400 Independence Ave, SW
Rm. 0709, South Building
Washington, DC 20250
Telephone (202) 720-5021**

**THIS PROPOSED GRADE STANDARD IS FOR DISCUSSION PURPOSES ONLY AND
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I. Product description.

Frozen onions are the frozen product prepared from fresh, clean, sound, firm bulbs of the common commercial varieties of onions, *Allium cepa*, which have been properly prepared, blanched or unblanched and are then frozen in accordance with good commercial practice and maintained at temperatures necessary for the preservation of the product.

II. Styles.

- (a) **Strips** means stemmed, peeled bulbs which have been cut into slices at the apex or top. This style may be further identified by approximate dimension of the cross-section, for example:

Width x Random- 3/8" x random; 1/2" x random; or 3/4" x random

- (b) **Diced** means stemmed, peeled bulbs which have been cut into approximate square pieces greater than 3/8 inch (10mm) or less than 3/4 inch (20mm). Approximate dimensions may further identify this style. For example: 3/4" x 3/4", or 1/4" x 1/4".

- (c) **Whole** means whole stemmed, peeled bulbs of the sizes listed below:

(1) **Type I-** Whole Onions are 5/8 inch (16 mm) to 1-3/4 inch (45 mm) in diameter in the greatest dimension of the onion at right angles to a line running from the stem to the root.

(2) **Type II-** Pearl Onions are 3/8 inch (10 mm) to 5/8 inch (16 mm) in diameter in the greatest dimension of the onion at right angles to a line running from the stem to the root.

- (d) **Minced** means the style of frozen onions that have been cut or chopped in small finely divided pieces.

III. Requirements for style.

- (a) **Strips style.** A maximum of 20%, by weight, of units does not meet the style description.
- (b) **Diced style.** A maximum of 20%, by weight, of diced units, 20 mm (0.75 in) or greater, and a maximum of 10%, by weight, of diced units less than 6 mm (0.25 in) in the greatest dimension across the unit are allowed.

- (c) **Whole.**
 - (1) **Regular style (Type I).** The units are well shaped and that approximately 10 percent by count of the units (lot average) may exceed 1-3/4 inches (45 mm), or are less than 5/8 inch (16 mm) at the widest portion of the unit.
 - (2) **Pearl Onions (Type II).** The units are well shaped and that approximately 10 percent by count of the units may be less than 3/8 inch (10 mm), or greater than 3/4 inch (20 mm) in the greatest portion of the unit.
- (d) **Minced.** The units are fairly evenly divided and the product as a whole, appears uniform in consistency.

IV. Definitions of terms.

- (a) **Acceptable quality level (AQL)** means the maximum percent of defective units or the maximum number of defects per hundred units of product that, for the purpose of acceptance sampling, can be considered satisfactory as a process average.
- (b) **Appearance.**
 - (1) **Good appearance** means that markedly variable units, small specks or other factors, do not significantly affect the overall appearance or edibility of the onion.
 - (2) **Reasonably good** appearance means that the overall appearance or edibility of the onion is slightly but not seriously affected by markedly variable units, small specks or other factors.
- (c) **Basal plate** means the portion of the onion where the root attaches to the onion bulb. The basal plate must exceed 10mm (0.38in) in diameter to be considered a defect.
- (d) **Blemished** means the unit is affected or damaged by pathological injury, insect injury, or any other injury, which singly or in combination, affects the appearance or eating quality of the unit. Internal sprouts that show no discoloration are not considered as being blemished.
 - (1) **Minor blemish** means a unit with tan to brown blemish(s), which in the aggregate, exceeds the area of a circle 2 mm (0.19 in) in diameter but not more than 6 mm (0.25 in) in diameter.

- (2) **Major blemish** means a unit with a tan to dark blemish(s), which in the aggregate, exceeds the area of a circle 6 mm (0.25 in) in diameter.
- (3) **Decay** means the bacterial or fungal deterioration of a unit to the extent that the appearance or eating quality is seriously affected or to a degree that the unit is offensive.
- (e) **Character** means the extent of firmness and compactness of the onion unit and its degree of freedom from slime, and soft, mushy units.
- (f) **Color** refers to the predominating and characteristic color of the exterior surface of the units of frozen onions.
- (1) **Good color** means that over 90 percent by weight of the frozen onions have a good characteristic bright white to creamy white color which may include greenish areas *and/or stripes* on the surface of the units that is typical for the variety and with respect to Type I and Type II, variations in color do not materially affect the appearance of the product. *The color of Grade "A" frozen onions is not significantly affected by oxidation, dull grayish-white or water-white casts or other discoloration, such as a yellowish, or dull brownish cast.*
- (2) **Reasonably good color** means that over 75 percent by weight of the individual units have a reasonably bright characteristic color which may include greenish areas and/or stripes that are typical for the variety and with respect to Type I and Type II and that variations in color do not seriously affect the appearance of the product. *The product is not seriously affected by oxidation, dull grayish-white casts, or water-white casts, or other discoloration, such as a yellowish or dull brownish cast.*
- (3) **Poor color** means the units fail the definition of reasonably good color.

Defect means any nonconformance of a unit(s) of product from a specified requirement of a single quality characteristic.

Extraneous vegetable material means any onion plant material including but not limited to the basal plate, stem material, or roots.

Loose scales, in whole onions, means pieces of onion layers that have become detached from the whole onion or whole or partial scales/layers that have become detached from the whole onion.

Mechanical damage means that the appearance of the unit is affected by trimming, or the unit is crushed, broken, or poorly cut to the extent that the appearance is materially affected.

Normal flavor and odor means that the onion, before and after cooking, has a flavor and odor that is normal and is free from objectionable flavors and odors, grit or dirt.

Root material means the part of the onion consisting of roots that normally are attached to the basal plate. The root material must exceed 1/2 inch (12 mm) in length and be attached to the basal plate to be considered a defect.

Stem material means the inner portion of the onion bulb. This portion is part of the onion flesh and should not be discolored, excessively woody, or soft and mushy.

Sprout material means the material from the onion stem at the top of the onion that is tough, fibrous, or leathery. The seed stalk may be white, brown to tan, or green in color and is exceedingly tough and woody.

Peel means the thin outer skin of the bulb, called the tunic. Peel is usually creamy, white to brown in color, tough, and tissue-like. One defect is equivalent to 1/2 square inch (12 mm).

Sample size means the amount of product specified to use for grading. For varietal characteristics, color, flavor and odor, and appearance, a sample unit is the entire container. For blemishes, character, specified defects, mechanical damage, and loose scales, a sample unit is 50 units by count for Whole style, 400 grams by weight for strips, diced, and minced styles. It may be:

- (1) The entire contents of a container;
- (2) A portion of the contents of a container; or

A combination of the contents of two or more containers.

(q) **Tolerance (TOL)** means the percentage of defective units allowed for each quality factor for a specific sample size.

Unit means a whole peeled bulb, immature bulb, or portion of such, in frozen onions.

V. **Grades.**

(a) **U.S. Grade A** is the quality of frozen onions that meets the following prerequisites in which the onions:

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- (1) Have similar varietal characteristics,
 - (2) Have a normal flavor and odor,
 - (3) Have a good color; and
 - (4) Is within the limits for defects as specified in Tables I and II of this subpart, as applicable for the style in Section II.
- (b) **U.S. Grade B** is the quality of frozen onions that meets the following prerequisites in which the onion:
- (1) Has similar varietal characteristics;
 - (2) Has a normal flavor and odor;
 - (3) Has a reasonably good color; and
 - (4) Is within the limits for defects as specified in Tables I and II of this subpart as applicable for the style in Section II.
- (c) **Substandard** is the quality of frozen onions that fails to meet the requirements of U.S. Grade B.

VI. Factors of quality.

The grade of frozen onions is based on meeting the requirements for the following factors:

- (a) Prerequisites;
- (1) Varietal characteristics;
 - (2) Color;
 - (3) Flavor and odor; and
 - (4) Appearance;
- (b) Classified Quality Factors and Defects;
- (1) Poor colored units;
 - (2) Decay (Critical Defect);
 - (3) Major blemishes;

- (4) Minor blemishes;
- (5) Total blemishes (Critical, Major, and Minor);
- (6) Character;
- (7) Mechanical Damage;
- (8) EVM;
 - (a) Basal plate material
 - (b) Stem material
 - (c) Root material
- (9) Peel;

Loose scales (In Whole Style Only);

Sprout material exceeding 3/8 inch.

VII. Requirements for classified quality factors and defects.

- (a) **Sample size** can be found in Section IV (n), Definition of Terms.
- (b) **Acceptance criteria** for specified defects can be found in Tables I and II, that follow:

**TABLE I
AQL's AND TOLERANCES (TOL.) FOR DEFECTS IN WHOLE STYLE
BASED ON 50 UNITS OF PRODUCT FOR 13 SAMPLE UNITS, 50x13 = 650 UNITS**

Sample Units x Sample unit Size			1 x 50	3 x 50	6 x 50	13 x 50	21 x 50	29 x 50
Units of Product			50	150	300	650	1050	1450
Defects	AQL	TOL						
GRADE A			ACCEPTANCE NUMBERS					
Poor Color	3.8	5	4	9	17	33	50	67
Decay (Critical Defect)	0.612	1	1	2	4	7	10	14
Seriously Blemished	0.612	1	1	2	4	7	10	14
Major Blemished	2.17	3	3	6	11	20	31	41
Total Blemished (Critical, Major, Minor)	3.8	5	4	9	17	33	50	67
Poor Character or Loose Structure	1.3	2	2	4	7	13	20	26
Mechanical Damage	1.3	2	2	4	7	13	20	26
EVM Basal Plate Stem Material Root Material	1.3	2	2	4	7	13	20	26
Sprout Material	3.8	5	4	9	17	33	50	67
* Peel (sq. in.)	1.3	2	2	4	7	13	20	26
Loose scales	2.9	3	3	8	13	26	39	14

* 1/2 square inch = one defect

**TABLE I (Continued)
AQL's AND TOLERANCES (TOL.) FOR DEFECTS IN WHOLE STYLE**

Sample Units x Sample unit Size			1x5 0	3x5 0	6x5 0	13x 50	21x 50	29x50
Units of Product			50	150	300	650	105 0	1450
GRADE B			ACCEPTANCE NUMBERS					
Poor Color	8.2	10	7	18	33	65	101	137
Decay	1.3	2	2	4	7	13	20	26
Serious Blemish	1.3	2	2	4	7	13	20	26
Major Blemish	3.8	5	4	9	17	33	50	67
Total Blemished (Critical, Major)	8.2	10	7	18	33	65	101	137
Poor Character Loose Structure	2.9	3	3	8	13	26	39	53
Mechanical Damage	2.9	3	3	8	13	26	39	53
EVM Basal Plate	2.9	3	3	8	13	26	39	53
Sprout Material	8.2	10	7	18	33	65	101	137
* Peel (sq.in.)	2.9	3	3	8	13	26	39	53
Loose scales	3.8	4	4	9	17	33	50	67

* 1/2 square inch = one defect

TABLE II
AQL's AND TOLERANCES (TOL.) FOR DEFECTS IN STRIPS, DICED, AND MINCED STYLES **BSD**
ON 400 GRAMS OF PRODUCT FOR 13 SAMPLE UNITS, 400x13 = 5200 GRAMS

Sample Units x Sample unit Size			1 x 400	3 x 400	6 x 400	13 x 400	21 x 400	29 x 400
Units of Product			400	1200	2400	5200	8400	11600
Defects	AQL	TOL						
GRADE A			ACCEPTANCE NUMBERS					
Poor Color	4.5	5	25	66	125	259	410	560
Decay (Critical Defect)	0.8	1	6	15	26	52	80	108
Serious Blemish	0.8	1	6	15	26	52	80	108
Major Blemish	1.71	2	11	28	51	104	163	221
Total Blemished (Critical, Major, Minor)	4.5	5	25	66	125	259	410	516
Poor Character	1.71	2	11	28	51	104	163	221
Mechanical Damage	3.6	4	20	54	101	209	331	451
EVM Basal Plate Stem Material Root Material	1.71	2	11	28	51	104	163	221
*Peel (sq. in.)	1.71	2	11	28	51	104	163	221

* 1/2 square inch = one defect

TABLE II, CONTINUED
AQL's AND TOLERANCES (TOL.) FOR DEFECTS IN STRIPS, DICED AND MINCED STYLE
BASED ON 400 GRAMS OF PRODUCT FOR 13 SAMPLE UNITS, 400x13 = 5200 GRAMS

Sample Units x Sample unit Size	1 x 400	3x400	6 x 400	13 x 400	21 x 400	29 x 400
Units of Product	400	1200	2400	5200	8400	11600
Defects	AQL	TOL				

GRADE B			ACCEPTANCE NUMBERS					
Poor Color	9.3	10	47	129	248	520	827	1133
Decay (Critical Defect)	1.71	2	11	28	51	104	163	221
Serious Blemish	1.71	2	11	28	51	104	163	221
Major Blemish	3.6	4	20	54	101	209	331	451
Total Blemishes (Critical, Major, &Minor)	9.3	10	47	129	248	520	827	1133
Poor Character	3.6	4	20	54	101	209	331	454
Mechanical Damage	7.4	8	38	104	199	417	663	907
EVM Basal Plate Stem Material Root Material	1.71	4	11	28	51	104	163	221
* Peel (sq. in.)	3.6	4	20	54	101	209	331	451

* 1/2 square inch = one defect

VIII. 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 Products" (7 CFR 52.1 through 52.83).

IX. Acceptance criteria.

- (a) **Style.** A lot of frozen onion is considered as meeting the requirements for style if the requirements in Section III as applicable are not exceeded.
- (b) **Quality Factors.** A lot of frozen onions is considered as meeting the requirements for quality if:
 - (1) The prerequisites specified in Section VI are met; and
 - (2) The Acceptance Numbers in Table I or II, as applicable, are not exceeded.
- (c) **Single Sample Unit.** Each unofficial sample unit submitted for quality evaluation will be treated individually and is considered as meeting requirements for quality and style if:
 - (1) The prerequisites specified in Section VI are met; and
 - (2) The requirements for style in Section III and the Acceptable Quality Levels (AQL's) in Tables I and II, in Section VII, as applicable, are not exceeded.