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United States Standards for Grades of Canned Mushrooms

Effective May 20, 2019

This issue of the United States Standards for Grades of Canned Mushrooms (84 FR 16381) supersedes the previous issue which has been in effect since April 7, 1962.

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 fresh and processed fruits, vegetables, and specialty crops 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 U.S. grade standards and inspection instructions for all fresh and processed fruits, vegetables, and specialty crops are available on the internet and upon request at the address below. These documents provide detailed interpretations of the grade standards and provide step-by-step procedures for grading the product.

Grade standards are issued by the U.S. Department of Agriculture (USDA) after careful consideration of all data and views submitted during rulemaking. The Department welcomes suggestions for improving the standards in future revisions. Comments may be submitted to, and copies of standards and inspection instructions obtained from:

Director, Specialty Crops Inspection Division
Specialty Crops Program,
USDA, Agricultural Marketing Service
1400 Independence Avenue, SW, STOP 0240
Washington, D.C. 20250

Authority: 7 U.S.C. 1621-1627.

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.

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United States Standards for Grades of Canned Mushrooms

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Product Description, Color Types, Styles, and Grades

§52.1481 Product description.

Canned mushrooms, as defined in the definitions and standards of identity for canned mushrooms (21 CFR 155.201) issued pursuant to the Federal Food, Drug, and Cosmetic Act, means the product prepared from the sound, succulent, fresh mushroom by proper trimming, washing, and sorting and is packed with the addition of water in hermetically sealed containers and sufficiently processed by heat to assure preservation of the product. Salt, or monosodium glutamate, or both may be added in a quantity sufficient to season the product. Ascorbic acid (Vitamin C) may be added in a quantity not to exceed 37.5 milligrams for each ounce of drained weight of mushrooms.

§52.1482 Color types of canned mushrooms.

(a) **White or cream.**

(b) **Brown.**

§52.1483 Styles of canned mushrooms.

(a) **Whole** is the style of canned mushrooms that consists of the caps with attached stems which are more than 1/8 inch in length when measured from the under side of the cap to the cut end of the stem.

(b) **Buttons** is the style of canned mushrooms that consists of the caps with attached stems which are cut transversely below the veil so that in 85 percent or more, by count, of the units the attached stem when measured from the under side of the cap to the cut end of the stem does not exceed 1/8 inch in length; and in the remaining units none of the attached stems may be more than 1/4 inch in length.

(c) **Sliced whole** is the style of canned mushrooms that consists of units which have been sliced from whole mushrooms so that in 80 percent or more, by weight, of all the units the direction of the slice is approximately parallel to the longitudinal axis of the stem; and not more than 5 percent, by weight of all the units may be detached portions of stems.

(d) **Random sliced whole** is the style of canned mushrooms that consists of units which have been sliced from whole mushrooms in a random manner so that the direction of the slice may materially deviate from approximately parallel to the longitudinal axis of the stem; and not more than 15 percent, by weight of all the units may be detached portions of stem.

(e) **Sliced buttons** is the style of canned mushrooms that consists of units which have been sliced from button mushrooms so that in 90 percent or more, by weight, of all the units the direction of the slice is approximately parallel to the longitudinal axis of the stem.

- (f) **Stems and pieces** or **pieces and stems** (hereinafter referred to as stems and pieces) is the style of canned mushrooms that consists of units which do not conform to any of the foregoing styles and are predominantly cut or broken portions of the caps and stems and may contain units of any of the foregoing styles.

§52.1484 Grades of canned mushrooms.

- (a) **U.S. Grade A** is the quality of canned mushrooms that possess similar varietal characteristics; that possess a normal flavor and odor; that possess a good color; that are practically uniform in size and shape, except for the style of stems and pieces; that are practically free from defects; that possess a good character; and that for those factors which are scored in accordance with the scoring system outlined in this subpart the total score is not less than 90 points: *Provided*, That the canned mushrooms may be fairly uniform in size and shape for the applicable styles if the total score is not less than 90 points.
- (b) **U.S. Grade B** is the quality of canned mushrooms that possess similar varietal characteristics; that possess a normal flavor and odor; that possess a fairly good color; that are fairly uniform in size and shape, except for the style of stems and pieces; that are fairly free from defects; that possess a fairly good character; and that for those factors which are scored in accordance with the scoring system outlined in this subpart the total score is not less than 80 points: *Provided*, That the canned mushrooms may fail to meet the requirements for U.S. Grade B for the factor of uniformity of size and shape for the applicable styles if the total score is not less than 80 points.
- (c) **Substandard** is the quality of canned mushrooms that fail to meet the requirements of U.S. Grade B.

Sizes, Fill of Container, and Drained Weights

§52.1485 Sizes of canned mushrooms in the styles of whole and buttons.

- (a) **No. 0 (Petite)** size mushrooms will pass through a round opening 1/2 inch in diameter.
- (b) **No. 1 (Tiny)** size mushrooms will pass through a round opening 5/8 inch in diameter but will not pass through a round opening 1/2 inch in diameter.
- (c) **No. 2 (Small)** size mushrooms will pass through a round opening 7/8 inches in diameter but will not pass through a round opening 5/8 inch in diameter.
- (d) **No. 3 (Medium)** size mushrooms will pass through a round opening 1-1/8 inches in diameter but will not pass through a round opening 7/8 inch in diameter.
- (e) **No. 4 (Large)** size mushrooms will pass through a round opening 1-5/8 inches in diameter but will not pass through a round opening 1-1/8 inches in diameter.

- (f) **No. 5 (Extra Large)** size mushrooms are those too large to pass through a round opening 1-5/8 inches in diameter.

§52.1486 Fill of container for canned mushrooms.

The standard for fill of container for canned mushrooms 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. The standard of fill of container for canned mushrooms is such that the drained weight of mushrooms is not less than 56 percent of the water capacity of the container if such capacity is less than 11.0 ounces avoirdupois; not less than 59 percent of the water capacity of the container if such capacity is 11.0 ounces or more but less than 25 ounces avoirdupois; and not less than 62 percent of the water capacity of the container if such capacity is 25 ounces avoirdupois or more. Canned mushrooms which do not meet this requirement are Below Standard in Fill.

§52.1487 Minimum drained weights for canned mushrooms.

- (a) **General.** The total weight of drained mushrooms (drained weight) shall be not less than that shown for the respective size of containers in Table I of this section.
- (b) **Method of ascertaining the drained weight.** The total weight of drained mushrooms is determined by emptying the contents of the container upon a United States Standard No. 8 circular sieve of proper diameter containing 8 meshes to the inch (0.0937 ± 3 percent, square openings) so as to distribute the product evenly, inclining the sieve slightly to facilitate drainage, and allowing to drain for two minutes. The drained weight is the weight of the sieve and mushrooms less the weight of the dry sieve. A sieve 8 inches in diameter is used for the equivalent of a No. 3 size can (404 x 700) and smaller and a sieve 12 inches in diameter is used for containers larger than the equivalent of a No. 3 size can.

Table I
Minimum drained weight of canned mushrooms

Container Designation (metal, unless otherwise stated)	Container size overall dimensions		Capacity weight H ₂ O at 68°F	Minimum drained weight ounces (avoirdupois)
	Diameter (inches)	Height (inches)		
2 Z Mushroom	2-2/16	2-4/16	3.57	2.0
2-1/2 Z Glass	—	—	4.464	2.5
3 Z Mushroom	2-2/16	3-4/16	5.36	3.0
4 Z Mushroom	2-11/16	2-12/16	7.15	4.0
8 Z Mushroom	3	4	13.55	8.0
Jumbo	3-7/16	5-10/16	25.70	16.0
No. 10	6-3/16	7	109.45	68.0

Factors of Quality

§52.1488 Ascertaining the grade.

- (a) The grade of canned mushrooms is ascertained by considering in conjunction with the requirements of the respective grade the respective ratings for the factors of color, uniformity of size and shape, defects, and character.
- (b) 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	30
Uniformity of size and shape	20
Defects	30
Character	20
Total Score	100

- (c) **Normal flavor and odor** means that the product is free from objectionable flavors and objectionable odors of any kind.

§52.1489 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, 18 to 20 points means 18, 19, or 20 points).

§52.1490 Color.

- (a) **“A” classification.** Canned mushrooms that possess a good color may be given a score of 27 to 30 points. **Good color** means that the canned mushrooms possess a color that is practically uniform, bright, and typical of canned mushrooms produced from mushrooms of similar varietal characteristics and meet the following additional requirements for the respective color type:
- (1) **White or Cream.** The color of the surface of the individual caps or portions thereof is not darker than medium cream, which color may possess a slight tannish cast that does not more than slightly affect the overall color appearance of the units, individually or collectively; and with respect to the styles of sliced buttons, sliced whole, random sliced whole, and stems and pieces, the color of gills of the sliced units is not darker than light tannish gray: *Provided*, That in sliced units the contrast in color between the gills and the surface of the cap of such sliced units does not more than slightly affect the overall color appearance of the product.
 - (2) **Brown.** The color of the surface of the individual caps is not darker than light brown, which color may possess a slight grayish cast that does not more than slightly affect the overall color appearance; and with respect to the styles of sliced buttons, sliced whole, random sliced whole, and stems and pieces, the color of the gills of the sliced units is not darker than medium brownish gray: *Provided*, That in sliced units the contrast in color between the gills and the surface of the cap of such sliced units does not more than slightly affect the overall color appearance of the product.
- (b) **“B” classification.** Canned mushrooms that possess a fairly good color may be given a score of 24 to 26 points. Canned mushrooms 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). **Fairly Good Color** means that the canned mushrooms possess a color that is typical of canned mushrooms produced from mushrooms of similar varietal characteristics and that such color may be dull but not to the extent that the appearance of the product is seriously affected; and that the canned mushrooms meet the following additional requirements for the respective color types:
- (1) **White or Cream.** The color of the surface of the individual caps may be dark cream, which color may possess a gray or brown cast that does not seriously affect the overall color appearance of the product; and with respect to the styles of sliced buttons, sliced whole, random sliced whole, and stems and pieces, the color of the gills of the sliced units is not darker than tannish gray: *Provided*, That in sliced units the contrast in color between the gills and surface of the cap of such sliced units does not seriously affect the overall color appearance of the product.

- (2) **Brown.** The color of the surface of the individual caps may be medium brown in color which color may possess a grayish cast that does not seriously affect the overall color appearance of the product, and with respect to the styles of sliced buttons, sliced whole, random sliced whole, and stems and pieces, the color of the gills of the sliced units may be dark brownish gray: *Provided*, That in sliced units the contrast in color between the gills and surface of the cap of such sliced units does not seriously affect the overall color appearance of the product.
- (c) **“SStd” classification.** Canned mushrooms that fail to meet the requirements of paragraph (b) of this section may be given a score of 0 to 23 points and shall not be graded above Substandard, regardless of the total score for the product (this is a limiting rule).

§52.1491 Uniformity of size and shape.

- (a) **General.** The factor of uniformity of size and shape for the style of stems and pieces of canned mushrooms is not scored; the other three factors (color, defects, and character, as applicable are scored and the total multiplied by 100 and divided by 80, dropping any fractions to determine the total score.
- (b) **Definitions of terms.**
- (1) **Diameter.** The diameter of a cap in the styles of whole, buttons, sliced whole mushrooms, and sliced buttons means the greatest width of the cap when measured parallel with the under side of the cap.
- (2) **Center slice.** Center slice in the styles of sliced buttons and sliced whole mushrooms means a unit sliced from a mushroom button or from a whole mushroom approximately parallel to the longitudinal stem axis; possesses two cut surfaces; and measures more than 1/2 inch in the longest dimension.
- (3) **Small side-slice.** Small side-slice in the styles of sliced buttons, sliced whole mushrooms, and random sliced whole mushrooms means a slice without attached stem or portion of stem; which possesses only one cut surface; and which measures 1/2 inch or less in the longest dimension.
- (c) **“A” classification.** Except in the style of stems and pieces, canned mushrooms that are practically uniform in size and shape may be given a score of 18 to 20 points. **Practically uniform in size and shape** has the following meanings with respect to the applicable styles of canned mushrooms:
- (1) **Whole; buttons.** The units are practically uniform in shape; the stems are cut transversely; and the diameter of the cap with the largest diameter does not exceed the diameter of the cap with the smallest diameter by more than 1/4 inch; and of all the units in the container, in the 85 percent,

by count, with the most uniform diameters, the diameter of the cap with the largest diameter does not exceed the diameter of the cap with the smallest diameter by more than 1/8 inch.

- (2) **Sliced whole mushrooms, sliced buttons.** The presence of irregular-shaped units does not materially affect the appearance of the product; not more than 5 percent, by weight, of the units may be small side-slices; and the diameter of the center slice with the largest diameter does not exceed the diameter of the center slice with the smallest diameter by more than 3/8 inch.
 - (3) **Random sliced whole mushrooms.** Not more than 5 percent, by weight, of all the units may be small side-slices.
- (d) **“B” classification.** Except in the styles of stems and pieces, canned mushrooms that are fairly uniform in size and shape may be given a score of 16 or 17 points. **Fairly uniform in size and shape** has the following meanings with respect to the applicable styles of canned mushrooms;
- (1) **Whole; buttons.** The units are fairly uniform in shape; the stems are cut transversely; and of all the units in the container, in the 85 percent, by count, with the most uniform diameters, the diameter of the cap with the largest diameter does not exceed the diameter of the cap with the smallest diameter by more than 1/4 inch.
 - (2) **Sliced whole mushrooms; sliced buttons.** The presence of irregular shaped units does not seriously affect the appearance of the product; not more than 10 percent, by weight, of the units may be small side-slices; and the diameter of the center slice with the largest diameter does not exceed the diameter of the center slice with the smallest diameter by more than 5/8 inch.
 - (3) **Random sliced mushrooms.** Not more than 10 percent, by weight, of the units may be small side-slices.
- (e) **“SStd” classification.** Canned mushrooms that fail to meet the requirements of paragraph (d) of this section may be given a score of 0 to 15 points. Canned mushrooms 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 partial limiting rule).

§52.1492 Defects.

- (a) **General.** The factor of defects refers to the degree of freedom from units which are crushed or broken, damaged, or seriously damaged.

(b) **Definitions of terms.**

- (1) **Crushed or broken unit** with respect to all styles other than the style of stems and pieces means a unit that is crushed to the extent so as to destroy its normal shape or that is severed into two or more separate parts.
- (2) **Damaged** means damaged by discoloration, pathological injury, mechanical injury, or damaged by other means to such an extent that the appearance or eating quality of the unit is materially affected. Knife marks resulting from the preparation of sliced whole mushrooms, random sliced whole mushrooms, or sliced buttons are not considered mechanical injury.
- (3) **Seriously damaged** means damaged to such an extent that the appearance or eating quality of the unit is seriously affected.

(c) **“A” classification.** Canned mushrooms that are practically free from defects may be given a score of 27 to 30 points. **Practically free from defects** means:

- (1) The product does not exceed the applicable allowances prescribed for the respective type of defect in Table II of this section; and
- (2) Notwithstanding the specified allowances, the presence of crushed or broken units in the applicable styles, damaged, and seriously damaged units does not materially affect the appearance or eating quality of the product.

(d) **“B” classification.** Canned mushrooms that are fairly free from defects may be given a score of 24 to 26 points. Canned mushrooms 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). **Fairly free from defects** means:

- (1) The product does not exceed the applicable allowances prescribed for the respective type of defect in Table II of this section; and
- (2) Notwithstanding the specified allowances, the presence of crushed or broken units in the applicable styles, damaged, and seriously damaged units does not seriously affect the appearance or eating quality of the product.

(e) **“SStd” classification.** Canned mushrooms that fail to meet the requirements of paragraph (d) of this section may be given a score of 0 to 23 points and shall not be graded above Substandard, regardless of the total score for the product (this is a limiting rule).

Table II
Summary of allowances for defects

Grade Classification	Maximum allowances		
	All styles except Stems and Pieces	All styles	
	Crushed or broken	Damaged	Seriously damaged ¹
A	5% by weight	5% by weight including 1% by weight	
B	10% by weight	10% by weight including 2% by weight	
SStd	Fails to meet foregoing requirements for Grade B classification		

¹ One unit in a container is permitted to be seriously damaged: **Provided**, That the total number of such seriously damaged units in all of the containers comprising the sample is within the percentage permitted for such defect.

§52.1493 Character.

- (a) **General.** The factor of character refers to the tenderness and texture of the canned mushrooms and the development of the cap in the styles of Whole and Buttons.
- (b) **Definitions of closed veil. Closed veil** means that the membrane which extends from the inner edge of the cap to the stem practically covers the gills.
- (c) **“A” classification.** Canned mushrooms that possess a good character may be given a score of 18 to 20 points. **Good character** means that the units are firm and tender; the product is practically free from fibrous or rubbery units; and that with respect to the styles of Whole and Buttons not less than 95 percent, by weight, of all the units possess closed veils. One unit which fails to meet the requirements for closed veils in the styles of Whole and Buttons is permitted in a container: *Provided*, That the average for such units in all the containers comprising the sample does not exceed 5 percent, by weight.
- (d) **“B” classification.** Canned mushrooms that possess a fairly good character may be given a score of 16 or 17 points. Canned mushrooms 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). **Fairly good character** means that the units are reasonably tender; may be slightly soft; the product is reasonable free from fibrous or rubbery units; and that with respect to the styles of Whole and Buttons is permitted in a container: *Provided*, That the average for such units in all the containers comprising the sample does not exceed 10 percent, by weight.
- (e) **“SStd” classification.** Canned mushrooms that fail to meet the requirements of paragraph (d) of this section may be given a score of 0 to 15 points and shall not be graded above Substandard, regardless of the total score for the product (this is a limiting rule).

Lot Inspection and Certification
§52.1494 Ascertaining the grade of a lot.

The grade of a lot of canned mushrooms 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).

Score Sheet
§52.1495 Score sheet for canned mushrooms.

Size and kind of container			
Container marks or identification			
Label			
Net weight (ounces)			
Vacuum (inches)			
Drained weight (ounces)			
Style			
Size			
Color			
Factors		Score Points	
Color	30	"A"	27-30
		"B"	24-26 ¹
		"Sstd"	0-23 ¹
Uniformity of size and shape	20	"A"	18-20
		"B"	16-17
		"Sstd"	0-15 ²
Defects	30	"A"	27-30
		"B"	24-26 ¹
		"Sstd"	0-23 ¹
Character	20	"A"	18-20
		"B"	16-17 ¹
		"Sstd"	0-15 ¹
Total Score	100		
Grade			
Normal flavor and odor			

¹ Indicates limiting rule.

² Indicates partial limiting rule.