



**United States  
Department of  
Agriculture**

**Agricultural  
Marketing  
Service**

**Dairy  
Division**

# **United States Standards for Grades of Nonfat Dry Milk (Roller Process)**

**Effective May 18, 1984**

# United States Standards for Nonfat Dry Milk (Roller Process)<sup>1</sup>

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## Definitions

§ 58.2550 *Nonfat dry milk.*

(a) “Nonfat dry milk” is the product resulting from the removal of fat and water from milk, and contains the lactose, milk proteins, and milk minerals in the same relative proportions as in the fresh milk from which made. It contains not over 5 percent by weight of moisture. The fat content shall not exceed 1½ percent by weight.

(b) The term “milk” when used in this subpart means fresh, sweet milk produced by healthy cows, that has been pasteurized before or during the manufacture of the nonfat dry milk.<sup>2</sup>

## U.S. Grades

§ 58.2551 *Nomenclature of U.S. grades.*

The nomenclature of U.S. grades is as follows:

U.S. Extra  
U.S. Standard

§ 58.2552 *Basis for determination of U.S. grades.*

(a) The U.S. grades of nonfat dry milk--roller process--are determined on the basis of flavor, physical appearance, bacterial estimate on the basis of standard plate count, milkfat content, moisture content, scorched particle content, solubility index and titratable acidity.

(b) The final U.S. grade shall be established on the basis of the lowest rating of any one of the quality characteristics.

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<sup>1</sup>Compliance with these Standards does not excuse failure to comply with the provisions of the Federal Food, Drug, and Cosmetic Act.

<sup>2</sup>Nonfat dry milk covered by these standards shall not contain buttermilk, whey, other dairy derived products, or any added preservative, neutralizing agent or other chemical.

§ 58.2553 *Specifications for U.S. grades.*

(a) *U.S. Extra grade.* U.S. Extra grade nonfat dry milk shall conform to the following requirements (See Tables I, II, and III):

(1) *Flavor* (Applies to the reconstituted product). Shall be sweet and desirable, but may possess the following flavors to a slight degree: chalky, feed, flat, and scorched.

(2) *Physical appearance.* Shall possess a uniform white to light cream natural color; free from lumps except those that break up readily with very slight pressure and reasonably free from visible dark particles. The reconstituted product shall be reasonably free from graininess.

(3) *Bacterial estimate.* Not more than 50,000 per gram standard plate count.

(4) *Milkfat content.* Not more than 1.25 percent.

(5) *Moisture content.* Not more than 4.0 percent.

(6) *Scorched particle content.* Not more than 22.5 mg.

(7) *Solubility index.* Not more than 15.0 ml.

(8) *Titrateable acidity.* Not more than 0.15 percent.

(b) *U.S. Standard grade.* U.S. Standard grade nonfat dry milk shall conform to the following requirements (See Tables I, II, and III):

(1) *Flavor* (Applies to the reconstituted product). Should possess a fairly desirable flavor but may possess the following to a slight degree: bitter, oxidized, stale, storage and utensil; the following to a definite degree: chalky, feed, flat, and scorched.

(2) *Physical appearance.* May possess a slight unnatural color; free from lumps except those that break up readily under slight pressure and moderately free from visible dark particles. The reconstituted product shall be reasonably free from graininess.

(3) *Bacterial estimate.* Not more than 100,000 per gram standard plate count.

(4) *Milkfat content.* Not more than 1.50 percent.

(5) *Moisture content.* Not more than 5.0 percent.

(6) *Scorched particle content.* Not more than 32.5 mg.

(7) *Solubility index.* Not more than 15.0 ml.

(8) *Titrateable acidity.* Not more than 0.17 percent.

§58.2554 *U.S. grade not assignable.*

Nonfat dry milk shall not be assigned a U.S. grade for one or more of the following reasons:

- (a) Fails to meet the requirements for U.S. Standard grade.
- (b) Has a direct microscopic clump count exceeding 100 million per gram.
- (c) Produced in a plant found on inspection to be using unsatisfactory manufacturing practices, equipment, or facilities, or to be operating under unsanitary plant conditions.
- (d) Produced in a plant which is not USDA approved.

§58.2558 *Test methods.*

All required tests shall be performed in accordance with “Methods of Laboratory Analysis”, DA Instruction No. 918-103 (dry milk product series), Dairy Grading and Standardization Branch, AMS, U.S. Department of Agriculture, Washington, DC 20250; and “Official Methods of Analysis of the Association of Official Analytical Chemists”, 13th Ed. or latest revision.

**Table I.--Classification of Flavor**

<b>Identification of flavor Characteristics</b>	<b>U.S. extra grade</b>	<b>U.S. standard grade</b>
Bitter	-----	Slight.
Chalky	Slight	Definite.
Feed	Slight	Definite.
Flat	Slight	Definite.
Oxidized	-----	Slight.
Scorched	Slight	Definite.
Stale	-----	Slight.
Storage	-----	Slight.
Utensil	-----	Slight.

**Table II.--Classification of Physical Appearance**

<b>Identification of physical appearance characteristics</b>	<b>U.S. extra grade</b>	<b>U.S. standard grade</b>
Dry product:		
Lumpy	Very slight	Slight.
Unnatural color	-----	Slight.
Visible dark particles	Slight	Definite.
Reconstituted product:		
Grainy	Slight	Slight.

**Table III.--Classification According to Laboratory Analysis**

<b>Laboratory tests</b>	<b>U.S. extra grade</b>	<b>U.S. standard grade</b>
Bacterial estimate, standard plate count per gram	50,000	100,000
Milkfat content; percent	1.25	1.50
Moisture content; percent	4.0	5.0
Scorched particle content; mg.	22.5	32.5
Solubility index; ml.	15.0	15.0
Titrateable acidity; percent	0.15	0.17

**Explanation of Terms**

§ 58.2562 *Explanation of terms.*

- (a) *With respect to flavor:*
  - (1) *Slight.* Detectable only upon critical examination.
  - (2) *Definite.* Easily detectable but not intense.
  - (3) *Bitter.* Similar to taste of quinine.
  - (4) *Chalky.* A tactual type of flavor, lacking in characteristic milk flavor.
  - (5) *Feed.* Feed flavors (such as alfalfa, sweet-clover, silage, or similar feed) in milk carried through into the nonfat dry milk.
  - (6) *Flat.* Lacking characteristic sweetness or full flavor.
  - (7) *Oxidized.* A flavor resembling cardboard and sometimes referred to as “cappy” or

“tallowy”.

(8) *Scorched*. A more intensified flavor than “cooked” and imparts a burnt aftertaste.

(9) *Stale, storage*. Lacking in freshness and imparting a “rough” aftertaste.

(10) *Utensil*. A flavor suggestive of improper or inadequate washing and sanitation of milking machines, utensils, or factory equipment.

(b) *With respect to physical appearance:*

(1) *Practically free*. Present only upon very critical examination.

(2) *Reasonably free*. Present only upon critical examination.

(3) *Moderately free*. Discernible upon careful examination.

(4) *Very slight pressure*. Lumps fall apart with only light touch.

(5) *Slight pressure*. Only sufficient pressure to disintegrate lumps readily.

(6) *Natural color*. A color that is white or light cream.

(7) *Grainy*. Minute particles of undissolved powder appearing on the surface of a glass or tumbler in a thin film.

(8) *Unnatural color*. A color that is more intense than light cream and is brownish, dull or grey-like.

(9) *Lumpy*. Loss of powdery consistency but not caked into hard chunks.

(10) *Visible dark particles*. The presence of scorched or discolored specks.