



# Instant Nonfat Dry Milk (iNDM) Standard

## Product Definition

Instant Nonfat Dry Milk (NDM) is Nonfat Dry Milk that has been produced in such a way as to substantially improve its dispersion and reconstitution properties over that produced by the conventional processes. Instant Nonfat Dry Milk contains not more than 1.25% fat and not more than 4.5% total moisture.

Instant Nonfat Dry Milk complies with all provisions of the U.S. Federal Food, Drug, and Cosmetic Act.

See the separate ADPI standard for [Nonfat Dry Milk \(NDM\)](#) for the conventional, non-instantized product.

## Composition of Extra Grade Instant Nonfat Dry Milk

Extra Grade is so designated to indicate the highest quality of Instant Nonfat Dry Milk. In addition to meeting the established USDA General Grading Requirements, it shall meet the following specifications:

Parameter	Units of Measure	Limits
Fat	%	1.25 maximum
Total moisture	%	4.5 maximum
Scorched particles <sup>1</sup>	mg/25g	15.0 maximum
Titratable acidity <sup>1</sup>	%	0.15 maximum
Solubility index <sup>1</sup>	mL	1.0 maximum

1 - Scorched particles, titratable acidity, and solubility index requirements ordinarily appear in ADPI Standards in the section defining Other Characteristics, but they are included here because they are integral to the established USDA requirements for Extra Grade.

## Other Characteristics of Extra Grade Instant Nonfat Dry Milk

Physico-chemical Properties		
Parameter	Units of Measure	Limits
Dispersibility	%	85 minimum
Color and appearance	visual	white to cream; reasonably free flowing and free from lumps that do not break up under slight pressure
Flavor and odor	sensory	sweet, pleasing and desirable; may possess chalky, cooked, feed and flat flavors to a slight degree

Microbiological Analysis		
Parameter	Units of Measure	Limits
Standard plate count	CFU/g	10,000 maximum
Coliforms	CFU/g	10 maximum

### Optional Test for Instant Nonfat Dry Milk

Another test which may be made on Instant Nonfat Dry Milk (not mandatory for grade designation, but, if determined, must comply with the limits as indicated) is:

Parameter	Units of Measure	Limits
Direct microscopic clump (DMC) count	count/g	40 million maximum

When it is determined that Instant Nonfat Dry Milk:

- 1) fails to meet the requirements of Extra Grade<sup>5</sup>;
- 2) fails to meet the requirements of the Optional Test, when such test has been made<sup>5</sup>; or
- 3) has been produced in a plant that is rated ineligible for USDA grading service or is not USDA approved;

then it shall not be assigned a grade.

5 - When tested in accordance with the standardized methods of analysis contained herein

## Additional ADPI Specifications

ADPI imposes the following additional requirements on Instant Nonfat Dry Milk:

Microbiological Analysis		
Parameter	Units of Measure	Limits
Yeast and mold	CFU/g	100 maximum
<i>Enterobacteriaceae</i> <sup>6</sup>	CFU/g	10 maximum
<i>Salmonella</i> genus	CFU/sample <sup>7</sup>	not detected
<i>Staphylococcus</i> (coagulase positive)	CFU/g	not detected <sup>8</sup>
<i>Listeria</i> genus	CFU/g	not detected

6 - The food industry is trending toward *Enterobacteriaceae* ("EB") as the most commonly used category of indicator organisms for gauging general process sanitation. For compliance with this Standard, coliforms shall be utilized for compliance with the USDA Grade requirements, while EB may be used at the discretion of the manufacturer.

7 - Typical minimum sample size for *Salmonella* testing is 25 g, but the exact sample size and methodology is left to the discretion of the manufacturer.

8 - Where the effective limit of quantitation for the test is 10 CFU/g (such as when a dilution factor of 10 is applied) then the test result must be not detected in order to comply with this Standard. Where the testing method is capable of quantifying microbial counts below 10 CFU/g, then a compliant result must be a value less than 10 CFU/g.

## Permissible Additives

Instant Nonfat Dry Milk may not contain, or be derived from:

- Dry buttermilk;
- Dry whey;
- Products other than skim milk, except that lactose may be added as a processing aid during instantizing.

If lactose is used, the amount of lactose shall be the minimum required to produce the desired effect, but in no case shall the amount exceed 2.0 percent of the weight of the Nonfat Dry Milk.

Added preservatives, neutralizing agents, and other chemicals are not permitted in Instant Nonfat Dry Milk.

Instant Nonfat Dry Milk may be fortified with vitamin A and/or vitamin D, provided that each quart of the resulting fluid milk, reconstituted in accordance with the label directions, conforms to the following fortified content requirements, as appropriate:

Parameter	Units of Measure	Content
Vitamin A	IU	2000
Vitamin D	IU	400

## Methods of Analysis

Parameter	Reference Method
Fat	AOAC 989.05
Total moisture	AOAC 925.45
Scorched particles	ADPI
Titrateable acidity	AOAC 947.05
Solubility index	SMEDP
Dispersibility	Modified Moats – Dabbah method
Standard plate count	SMEDP
Coliforms	SMEDP
Direct microscopic clump (DMC) count	SMEDP
Yeast and mold	FDA BAM
<i>Enterobacteriaceae</i>	FDA BAM
<i>Salmonella</i>	AOAC
<i>Staphylococcus</i>	AOAC
<i>Listeria</i>	FDA BAM

## Product Labeling

Recommended identification: Instant Nonfat Dry Milk

Instant Nonfat Dry Milk fortified with vitamin(s) \_\_\_\_\_  
where the vitamins are stated

## Typical Applications

Instant Nonfat Dry Milk is typically used for beverage purposes and as such, is usually fortified. Typical reconstitution schemes, by desired quantity of reconstituted liquid instant milk, are as follows:

Instant Nonfat Dry Milk quantity	cold water	liquid instant milk
$\frac{1}{3}$ cup	1 cup	about 1 cup
1 $\frac{1}{3}$ cup	3 $\frac{3}{4}$ cup	about 1 quart

Instant Nonfat Dry Milk without fortification may be procured as an ingredient in other food products, such as beverages, breads, soups, salad dressings, entrees, desserts, diet drinks, special dietary beverages, infant formulas, cosmetics, and others.

**Typical Storage & Shipping**

Product should be stored, shipped, and utilized according to the manufacturer’s established recommendations. As guidance, product should be stored and shipped in a cool, dry environment with temperature below 80°F and relative humidity below 65%. Stocks should be rotated and utilized in accordance with the manufacturer’s established date of expiration or retest.

**Typical Packaging**

Multiwall kraft bags with polyolefin inner liner, or other suitable closed containers (e.g., totes) are typical.

**Revision History**

This Standard is a legacy document and has been assigned prior version numbers on an *ex post facto* basis, according to its documented history of modifications, in order to comply with our new document control features and format. Full revision history is on file at ADPI and is available for query via [info@adpi.org](mailto:info@adpi.org) or by directly contacting the Vice President of Technical Services.

Current version details:

Version	Effective Date	Notes
3.0	07/06/2023	Migrated this Standard to the new modernized format as authorized by the ADPI Standards Committee. No previously established test parameters or limits were materially altered by this update. A reference to related ingredient standard Nonfat Dry Milk was added to the Product Definition section. Prohibited ingredients were stated in the Permissible Additives section that is provided in the modernized format, following the verbiage previously reviewed by the ADPI Standards Committee. Footnotes added in multiple sections, explaining: positioning of the scorched particles out of order as established by the new modernized format; optional nature of EB testing; sample size discretion for <i>Salmonella</i> testing; and the restatement of the limit for coagulase positive <i>Staphylococcus</i> . Added test method references for all parameters not already covered in version 2.0.