



AMERICAN
Dairy Products
INSTITUTE™

MILK PROTEIN

Dry Whole Milk (DWM)

Product Definition

Dry Whole Milk (DWM) usually is obtained by the removal of water from pasteurized milk, which also may have been homogenized. Alternatively, Dry Whole Milk may be obtained by blending fluid, condensed, or nonfat dry milk with liquid or dry cream, or with fluid, condensed, or dry milk; provided that the resulting Dry Whole Milk is equivalent in composition. Dry Whole Milk contains not less than 26% but not more than 40% milkfat (by weight) on an “as is” basis and not more than 5% moisture (by weight) on a milk solids-non-fat (SNF) basis. The primary Dry Whole Milk products are those having 26.0% and 28.5% milkfat. Optionally, Dry Whole Milk may be fortified with either vitamins A or D, or both.

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

Composition

PARAMETER	UNITS OF MEASURE	EXTRA GRADE DWM		STANDARD GRADE DWM	
		SPRAY DRIED LIMITS	ATMOSPHERIC ROLLER DRIED LIMITS	SPRAY DRIED LIMITS	ATMOSPHERIC ROLLER DRIED LIMITS
FAT	% (w/w)	26.0 – 40.0		26.0 – 40.0	
TOTAL MOISTURE	% (w/w, SNF basis)	4.5 maximum		5.0 maximum	
SCORCHED PARTICLES ¹	mg/25g	15.0 maximum	22.5 maximum	22.5 maximum	32.5 maximum
TITRATABLE ACIDITY ¹	%	0.15 maximum		0.17 maximum	
SOLUBILITY INDEX ¹	mL	1.0 maximum	15.0 maximum	1.5 maximum	15.0 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 or Standard Grade.

Other Characteristics

PHYSICO-CHEMICAL PROPERTIES			
PARAMETER	UNITS OF MEASURE	EXTRA GRADE DWM	STANDARD GRADE DWM
COLOR AND APPEARANCE	visual	white or light cream; free from lumps that do not break up under slight pressure; practically free from visible dark particles; free from graininess when reliquefied	
FLAVOR	sensory	sweet, pleasing and desirable; may possess a slight feed flavor and a definite cooked flavor; free from undesirable flavors	sweet and pleasing; may possess bitter, oxidized, scorched, stale and storage flavors to a slight degree; and feed and cooked flavors to a definite degree; free from undesirable flavors

Product Labeling

Recommended identifications:

Dry Whole Milk ____% Milkfat
(where the actual milkfat content is declared)

Dry Whole Milk ____% Milkfat, fortified with vitamin(s) ____
(where the vitamins are stated)

Protein Quality

Protein Digestibility Corrected Amino Acid
Score (PDCAAS).....1.00

Digestible Indispensable Amino Acid
Score (DIAAS).....1.16

Permissible Additives

Dry Whole 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

Functionality and Applications



HIGH PERFORMANCE:

Hydration Rate
Heat Stability

Dry Whole Milk is typically used in confectionery, bakery products, packaged dry mixes, dairy products, soups, sauces, frozen foods, beverages, and others.



MEDIUM PERFORMANCE:

Emulsification
Water Binding
Browning

The protein adjustment which is permitted for Dry Whole Milk is optional. Product manufactured without this adjustment, and in compliance with all other U.S. requirements, is equivalent in composition to Dry Whole Milk, and it may be utilized in U.S. standardized foods where Dry Whole Milk is specified by the corresponding Standard of Identity (SOI).

Nutrition Facts

servings per container	
Serving size	(100g)
Amount per serving	
Calories	500
% Daily Value*	
Total Fat 27g	35%
Saturated Fat 17g	85%
Trans Fat –g	
Cholesterol 95mg	32%
Sodium 370mg	16%
Total Carbohydrate 38g	14%
Dietary Fiber 0g	0%
Total Sugars 38g	
Includes 0g Added Sugars	0%
Protein 26g	
Vitamin D 1mcg	6%
Calcium 912mg	70%
Iron 0mg	0%
Potassium 1330mg	30%

*The % Daily Value tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.

Dry Whole Milk and Whole Milk Powder are analogous ingredients, with the former representing the U.S. definition and the latter representing the international (Codex Alimentarius) definition, respectively. The U.S. definition permits the blending of specific milk processing streams in order to achieve a final product which is equivalent to that obtained solely by drying whole milk; while the Codex standard allows for changing the fat and/or protein content of the product by adding specific permissible additives, ensuring that the casein-to-whey proteins ratio is not altered.

Product Examples

(launched in the last year) *Credit: Innova Market Insights*



Bowl & Basket Milk Chocolate Bar: This milk chocolate gets its characteristic milky flavor from dry whole milk. The milkfat in dry whole milk also provides richness and creaminess when combined with cocoa butter.



Boom Chicka Pop: The hot cocoa flavored coating on this popcorn snack contains whole milk powder. Whole milk powder combined with nonfat dry milk gives it a rich flavor and a clean label.



RealGood Foods Egg Sandwich: Dry whole milk plays a more minor role in the formulation of this breakfast sandwich. In this case it is part of the whole egg mixture, extending the egg protein and providing a more aerated egg texture.



Farin Up Belgian Waffles Mix: The whole milk powder in this Belgian style waffle mix provides a clean label while also contributing important functionality. It contributes to a tender structure, surface browning, and sweet browned flavors of the waffle.

Ingredient Labeling Note:

Dry Whole Milk may comply with all aspects of the definition for Whole Milk Powder, but Whole Milk Powder (which is permitted to be standardized) does not comply with Dry Whole Milk requirements by definition. This 'one-way' equivalence has implications for product formulation and labeled ingredient declarations.