Dairy Ingredients Application Guide

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Dairy Ingredient Selection by Food Application

Legend

HIGH

MEDIUM

LOW

DBM ..... Dry Buttermilk

MPC ..... Milk Protein Concentrate

MPI..... Milk Protein Isolate

MWP..... Milk Whey Powder, includes Milk Whey Protein Concentrates (mWPCs) and Milk Whey Protein Isolate (mWPI) NFDM/SMP Nonfat Dry Milk/Skimmed Milk Powder

RM Whey..... Reduced Minerals Whey

WMP..... Whole Milk Powder

WPC ..... Whey Protein Concentrate

WPH ..... Whey Protein Hydrolysates

WPI..... Whey Protein Isolate

WPPC ..... Whey Protein Phospholipid Concentrate

(1) Acid and Rennet casein are not soluble in water and need emulsifying salts to improve their ability to bind water and emulsify.

(2) Instantized versions of milk and whey protein ingredients are recommended for better dispersability

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Dairy Ingredient Selection by Food Application

BAKERY PRODUCTS

	WHEY PROTEINS								MILK PROTEINS						CASEINS				CARBOHYDRATES	
	Whey	RM Whey	WPC34	WPC80	WPI	WPPC	MWP	WPH	WMP	NFDM/ SMP	DBM	MPC70	MPC80	MPI	Micellar Casein	Acid Casein[1]	Rennet Casein[1]	Caseinates	Milk/Whey Permeate	Lactose
Browning	♦♦♦	♦♦♦	♦♦	♦♦	♦	♦	♦	♦	♦♦	♦♦	♦♦	♦	♦	♦					♦♦♦	♦♦♦
Whipping	♦	♦	♦♦	♦♦	♦♦♦	♦	♦♦♦	♦♦	♦	♦♦	♦	♦♦	♦♦	♦♦	♦♦					
Water Binding	♦	♦	♦	♦♦	♦♦	♦♦	♦♦	♦	♦♦	♦♦	♦♦	♦♦	♦♦♦	♦♦♦	♦♦♦			♦♦♦	♦	♦
Egg Replacement	♦	♦	♦♦	♦♦♦	♦♦♦	♦♦	♦♦♦	♦	♦	♦	♦	♦	♦	♦	♦			♦	♦	
Fat Replacement	♦	♦	♦♦♦	♦♦♦	♦♦♦	♦♦	♦♦♦	♦	♦♦	♦♦	♦	♦♦	♦	♦	♦			♦	♦	
Flavor Enhancement	♦♦♦	♦♦	♦♦	♦	♦	♦	♦	♦	♦♦♦	♦♦	♦♦	♦	♦	♦	♦			♦	♦♦♦	♦
Sodium Reduction																			♦♦♦	
Protein Enhancement	♦	♦	♦♦	♦♦♦	♦♦♦	♦♦♦	♦♦♦	♦♦	♦	♦♦	♦♦	♦♦♦	♦♦♦	♦♦♦	♦♦♦			♦♦♦		

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Dairy Ingredient Selection by Food Application

BEVERAGES-READY TO DRINK

	WHEY PROTEINS								MILK PROTEINS						CASEINS				CARBOHYDRATES	
	Whey	RM Whey	WPC34	WPC80	WPI	WPPC	MWP	WPH	WMP	NFDM/ SMP	DBM	MPC70	MPC80	MPI	Micellar Casein	Acid Casein[1]	Rennet Casein[1]	Caseinates	Milk/Whey Permeate	Lactose
HIGH ACID-PH 2.8-3.4																				
Heat Stability	♦♦	♦♦	♦♦	♦♦	♦♦♦	♦	♦♦♦	♦♦♦											♦♦♦	♦♦♦
Viscosity	♦	♦	♦	♦	♦	♦	♦	♦											♦	♦
Protein Enhancement	♦	♦	♦	♦♦♦	♦♦♦	♦	♦♦♦	♦♦♦												
Clarity	♦	♦	♦	♦	♦♦♦	♦	♦♦♦	♦♦♦											♦♦♦	♦♦♦
HIGH ACID-PH 3.5-4.5																				
Heat Stability	♦♦	♦♦	♦♦	♦♦	♦♦	♦	♦♦	♦♦♦	♦	♦	♦	♦	♦	♦	♦			♦	♦♦	♦♦♦
Viscosity	♦	♦	♦	♦	♦	♦	♦	♦	♦♦	♦♦	♦♦	♦♦	♦♦	♦♦	♦♦			♦♦	♦	♦
Protein Enhancement	♦	♦	♦	♦♦♦	♦♦♦	♦	♦♦♦	♦♦♦	♦	♦	♦	♦♦	♦♦	♦♦	♦♦			♦♦		
Clarity					♦♦		♦♦	♦♦											♦♦♦	♦♦♦
LOW ACID- PH 6.5-7.0																				
Heat Stability	♦	♦	♦	♦	♦	♦	♦	♦♦♦	♦♦♦	♦♦♦	♦♦♦	♦♦♦	♦♦♦	♦♦♦	♦♦♦			♦♦♦	♦♦	♦♦♦
Viscosity	♦	♦	♦	♦♦	♦♦	♦♦	♦♦	♦	♦♦	♦♦	♦♦♦	♦♦	♦♦♦	♦♦♦	♦♦♦			♦♦♦	♦	♦
Protein Enhancement	♦	♦	♦	♦♦♦	♦♦♦	♦♦	♦♦♦	♦♦♦	♦♦	♦♦	♦♦	♦♦♦	♦♦♦	♦♦♦	♦♦♦			♦♦♦		

BEVERAGES-READY TO MIX

	WHEY PROTEINS								MILK PROTEINS						CASEINS				CARBOHYDRATES	
	Whey	RM Whey	WPC34	WPC80	WPI	WPPC	MWP	WPH	WMP	NFDM/ SMP	DBM	MPC70	MPC80	MPI	Micellar Casein	Acid Casein[1]	Rennet Casein[1]	Caseinates	Milk/Whey Permeate	Lactose
Clarity At Acid pH	♦♦	♦♦	♦♦	♦	♦♦♦	♦	♦♦♦	♦♦♦	♦	♦	♦	♦	♦	♦	♦			♦	♦♦♦	♦♦♦
Viscosity	♦	♦	♦	♦	♦	♦	♦	♦	♦♦	♦♦	♦♦	♦♦	♦♦♦	♦♦♦	♦♦♦			♦♦♦	♦	♦
Protein Enhancement[2]	♦	♦	♦	♦♦♦	♦♦♦	♦♦	♦♦♦	♦♦♦	♦♦	♦♦	♦♦	♦♦♦	♦♦♦	♦♦♦	♦♦♦			♦♦♦		

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Dairy Ingredient Selection by Food Application

CONFECTIONERY

	WHEY PROTEINS								MILK PROTEINS						CASEINS				CARBOHYDRATES	
	Whey	RM Whey	WPC34	WPC80	WPI	WPPC	MWP	WPH	WMP	NFDM/ SMP	DBM	MPC70	MPC80	MPI	Micellar Casein	Acid Casein[1]	Rennet Casein[1]	Caseinates	Milk/Whey Permeate	Lactose
CHOCOLATE AND COMPOUND COATING																				
Emulsification	♦	♦	♦♦	♦♦	♦♦	♦♦	♦♦	♦	♦♦	♦♦	♦♦	♦♦♦	♦♦♦	♦♦♦	♦♦♦			♦♦♦	♦	♦
Sweetness Reduction	♦♦	♦♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦			♦	♦♦♦	♦♦♦
Whipping	♦	♦	♦♦	♦♦	♦♦♦	♦	♦♦♦	♦♦	♦	♦♦	♦	♦♦	♦♦	♦♦	♦♦			♦♦♦	♦	♦
Protein Enhancement	♦	♦	♦♦	♦♦♦	♦♦♦	♦♦♦	♦♦♦	♦♦♦	♦♦	♦♦	♦♦	♦♦♦	♦♦♦	♦♦♦	♦♦♦			♦♦♦		
Flavor Enhancement	♦♦	♦♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦			♦	♦♦♦	♦
NON-CHOCOLATE CONFECTIONERY																				
Browning	♦♦♦	♦♦♦	♦♦	♦	♦	♦	♦	♦	♦♦	♦♦	♦♦	♦♦	♦	♦	♦			♦	♦♦♦	♦♦♦
Emulsification	♦	♦	♦♦	♦♦	♦♦	♦♦	♦♦	♦	♦♦	♦♦	♦♦	♦♦♦	♦♦♦	♦♦♦	♦♦♦			♦♦♦	♦	♦
Whipping	♦	♦	♦♦	♦♦	♦♦♦	♦	♦♦♦	♦♦	♦	♦♦	♦	♦♦	♦♦	♦♦	♦♦			♦♦♦	♦	♦
Gelation	♦	♦	♦	♦♦	♦♦	♦♦♦	♦♦♦	♦♦♦												
Heat Stability	♦	♦	♦	♦	♦	♦	♦	♦♦♦	♦♦♦	♦♦♦	♦♦♦	♦♦♦	♦♦♦	♦♦♦	♦♦♦			♦♦♦	♦♦	♦♦♦
Water Binding	♦	♦	♦	♦♦	♦♦	♦♦	♦♦	♦	♦♦	♦♦	♦♦	♦♦	♦♦♦	♦♦♦	♦♦♦			♦♦♦	♦	♦
Protein Enhancement	♦	♦	♦	♦♦♦	♦♦♦	♦♦	♦♦♦	♦♦♦	♦	♦	♦	♦♦♦	♦♦♦	♦♦♦	♦♦♦			♦♦♦		
Flavor Enhancement	♦♦	♦♦	♦	♦	♦	♦	♦	♦	♦♦	♦♦	♦♦	♦	♦	♦	♦			♦	♦♦♦	♦

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Dairy Ingredient Selection by Food Application

FROZEN DESSERTS

	WHEY PROTEINS								MILK PROTEINS						CASEINS				CARBOHYDRATES	
	Whey	RM Whey	WPC34	WPC80	WPI	WPPC	MWP	WPH	WMP	NFDM/ SMP	DBM	MPC70	MPC80	MPI	Micellar Casein	Acid Casein[1]	Rennet Casein[1]	Caseinates	Milk/Whey Permeate	Lactose
Whipping	♦	♦	♦♦	♦♦	♦♦♦	♦	♦♦♦	♦♦	♦	♦♦	♦	♦♦	♦♦	♦♦	♦♦			♦♦♦	♦	♦
Emulsification	♦	♦	♦♦	♦♦	♦♦	♦♦	♦♦	♦	♦♦	♦♦	♦♦	♦♦♦	♦♦♦	♦♦♦	♦♦♦			♦♦♦	♦	♦
Fat Replacement	♦	♦	♦♦♦	♦♦♦	♦♦♦	♦♦	♦♦♦	♦	♦♦	♦♦	♦♦	♦♦	♦	♦	♦			♦		
Protein Enhancement	♦	♦	♦	♦♦♦	♦♦♦	♦♦	♦♦♦	♦♦♦	♦	♦	♦	♦♦♦	♦♦♦	♦♦♦	♦♦♦			♦♦♦		

NUTRITION BARS

	WHEY PROTEINS								MILK PROTEINS						CASEINS				CARBOHYDRATES	
	Whey	RM Whey	WPC34	WPC80	WPI	WPPC	MWP	WPH	WMP	NFDM/ SMP	DBM	MPC70	MPC80	MPI	Micellar Casein	Rennet Casein[1]	Acid Casein[1]	Caseinates	Milk/Whey Permeate	Lactose
Protein Enhancement	♦	♦	♦♦	♦♦♦	♦♦♦	♦♦♦	♦♦♦	♦♦♦	♦♦	♦♦	♦♦	♦♦♦	♦♦♦	♦♦♦	♦♦♦			♦♦♦		
Reduce Bar Hardening	♦	♦	♦	♦♦	♦♦	♦♦	♦♦	♦♦♦	♦	♦	♦	♦	♦	♦	♦			♦	♦	♦

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Dairy Ingredient Selection by Food Application

PROCESS CHEESE/IMITATION CHEESE

	WHEY PROTEINS								MILK PROTEINS						CASEINS				CARBOHYDRATES	
	Whey	RM Whey	WPC34	WPC80	WPI	WPPC	MWP	WPH	WMP	NFDM/ SMP	DBM	MPC70	MPC80	MPI	Micellar Casein	Acid Casein[1]	Rennet Casein[1]	Caseinates	Milk/Whey Permeate	Lactose
Emulsification	♦	♦	♦♦	♦♦	♦♦	♦♦	♦♦	♦	♦♦	♦♦	♦♦	♦♦♦	♦♦♦	♦♦♦	♦♦♦	♦♦♦	♦♦♦	♦♦♦	♦	♦
Water Binding	♦	♦	♦	♦♦	♦♦	♦♦	♦♦	♦	♦♦	♦♦	♦♦	♦♦	♦♦♦	♦♦♦	♦♦♦	♦♦♦	♦♦♦	♦♦♦	♦	♦
Gelation	♦	♦	♦	♦♦	♦♦	♦♦	♦♦	♦	♦♦	♦♦	♦♦	♦♦	♦♦♦	♦♦♦	♦♦♦	♦♦♦	♦♦♦	♦♦♦	♦	♦
Sodium Reduction																			♦♦♦	

PUDDING/MOUSSE

	WHEY PROTEINS								MILK PROTEINS						CASEINS				CARBOHYDRATES	
	Whey	RM Whey	WPC34	WPC80	WPI	WPPC	MWP	WPH	WMP	NFDM/ SMP	DBM	MPC70	MPC80	MPI	Micellar Casein	Acid Casein[1]	Rennet Casein[1]	Caseinates	Milk/Whey Permeate	Lactose
Water Binding	♦	♦	♦♦	♦♦	♦♦♦	♦	♦♦♦	♦♦	♦	♦♦	♦♦	♦♦	♦♦	♦♦	♦♦			♦♦♦	♦	♦
Whipping	♦	♦	♦♦	♦♦	♦♦	♦♦	♦♦	♦	♦♦	♦♦	♦	♦♦♦	♦♦♦	♦♦♦	♦♦♦			♦♦♦	♦	♦
Emulsification	♦	♦	♦	♦♦♦	♦♦♦	♦♦	♦♦♦	♦♦♦	♦	♦	♦♦	♦♦♦	♦♦♦	♦♦♦	♦♦♦			♦♦♦		
Protein Enhancement	♦	♦	♦	♦♦♦	♦♦♦	♦♦	♦♦♦	♦♦♦	♦	♦	♦	♦♦♦	♦♦♦	♦♦♦	♦♦♦			♦♦♦		

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Dairy Ingredient Selection by Food Application

SALTY SNACKS

	WHEY PROTEINS								MILK PROTEINS						CASEINS				CARBOHYDRATES	
	Whey	RM Whey	WPC34	WPC80	WPI	WPPC	MWP	WPH	WMP	NFDM/ SMP	DBM	MPC70	MPC80	MPI	Micellar Casein	Acid Casein[1]	Rennet Casein[1]	Caseinates	Milk/Whey Permeate	Lactose
Browning	♦♦♦	♦♦♦	♦♦	♦♦	♦	♦	♦	♦	♦♦	♦♦	♦♦	♦	♦	♦					♦♦♦	♦♦♦
Sodium Reduction																			♦♦♦	
Flavor Enhancement	♦♦♦	♦♦	♦♦	♦	♦	♦	♦	♦	♦♦♦	♦♦	♦♦	♦	♦	♦	♦			♦	♦♦♦	♦
Protein Enhancement	♦	♦	♦	♦♦♦	♦♦♦	♦♦	♦♦♦	♦♦♦	♦	♦	♦♦	♦♦♦	♦♦♦	♦♦♦	♦♦♦			♦♦♦		

SOUPS AND SAUCES

	WHEY PROTEINS								MILK PROTEINS						CASEINS				CARBOHYDRATES	
	Whey	RM Whey	WPC34	WPC80	WPI	WPPC	MWP	WPH	WMP	NFDM/ SMP	DBM	MPC70	MPC80	MPI	Micellar Casein	Acid Casein[1]	Rennet Casein[1]	Caseinates	Milk/Whey Permeate	Lactose
Water Binding-Viscosity	♦	♦	♦	♦♦	♦♦	♦♦	♦♦	♦	♦♦	♦♦	♦♦	♦♦	♦♦♦	♦♦♦	♦♦♦	♦♦♦	♦♦♦	♦♦♦	♦	♦
Emulsification	♦	♦	♦	♦♦♦	♦♦♦	♦♦	♦♦♦	♦♦♦	♦	♦	♦♦	♦♦♦	♦♦♦	♦♦♦	♦♦♦			♦♦♦		♦
Heat Stability	♦	♦	♦	♦	♦	♦	♦	♦♦♦	♦♦♦	♦♦♦	♦♦♦	♦♦♦	♦♦♦	♦♦♦	♦♦♦			♦♦♦	♦♦	♦♦♦
Sodium Reduction																			♦♦♦	
Flavor Enhancement	♦♦♦	♦♦	♦♦	♦	♦	♦	♦	♦	♦♦♦	♦♦	♦♦	♦	♦	♦	♦			♦	♦♦♦	♦
Protein Enhancement	♦	♦	♦	♦♦♦	♦♦♦	♦♦	♦♦♦	♦♦♦	♦	♦	♦	♦♦♦	♦♦♦	♦♦♦	♦♦♦			♦♦♦		

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Dairy Ingredient Selection by Food Application

YOGURT AND CULTURED PRODUCTS

	WHEY PROTEINS								MILK PROTEINS						CASEINS				CARBOHYDRATES	
	Whey	RM Whey	WPC34	WPC80	WPI	WPPC	MWP	WPH	WMP	NFDM/ SMP	DBM	MPC70	MPC80	MPI	Micellar Casein	Acid Casein[1]	Rennet Casein[1]	Caseinates	Milk/Whey Permeate	Lactose
Water Binding- Reduce Syneresis	♦	♦	♦♦	♦♦♦	♦♦♦	♦♦	♦♦♦	♦♦	♦♦	♦♦	♦	♦♦	♦♦	♦♦	♦♦			♦♦		
Gel Strength	♦	♦	♦	♦♦	♦♦	♦♦	♦♦	♦	♦♦	♦♦	♦	♦♦	♦♦♦	♦♦♦	♦♦♦	♦♦♦	♦♦♦	♦♦♦	♦	♦
Heat Stability	♦	♦	♦	♦	♦	♦	♦	♦♦♦	♦♦♦	♦♦♦	♦♦	♦♦♦	♦♦♦	♦♦♦	♦♦♦			♦♦♦	♦♦	♦♦♦
Protein Enhancement	♦	♦	♦	♦♦♦	♦♦♦	♦♦	♦♦♦	♦♦♦	♦	♦	♦	♦♦♦	♦♦♦	♦♦♦	♦♦♦			♦♦♦		

WHIPPED TOPPINGS

	WHEY PROTEINS								MILK PROTEINS						CASEINS				CARBOHYDRATES	
	Whey	RM Whey	WPC34	WPC80	WPI	WPPC	MWP	WPH	WMP	NFDM/ SMP	DBM	MPC70	MPC80	MPI	Micellar Casein	Acid Casein[1]	Rennet Casein[1]	Caseinates	Milk/Whey Permeate	Lactose
Whipping	♦	♦	♦♦	♦♦	♦♦	♦♦	♦♦	♦	♦♦	♦♦	♦	♦♦♦	♦♦♦	♦♦♦	♦♦♦			♦♦♦	♦	♦
Emulsification	♦	♦	♦	♦♦♦	♦♦♦	♦♦	♦♦♦	♦♦♦	♦	♦	♦♦	♦♦♦	♦♦♦	♦♦♦	♦♦♦			♦♦♦		

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