



AMERICAN
Dairy Products
INSTITUTE®

WHEY PROTEIN

BIOACTIVES

Whey Protein Phospholipid Concentrate (WPPC)

Also known as: ProCream

Product Definition

Whey Protein Phospholipid Concentrate (WPPC) is a co-product obtained through the microfiltration of whey, which concentrates whey proteins and whey phospholipids. WPPC composition varies in the marketplace, with protein, fat and lactose ranging from 50-69%, 12-38%, 6-12%, respectively. WPPC is sometimes marketed as whey cream or procream.

Whey Protein Phospholipid Concentrate complies with all provisions of the U.S. Federal Food, Drug, and Cosmetic Act.

Composition

PARAMETER	UNITS OF MEASURE	LIMITS
PROTEIN	%, w/w dry basis	50.0 minimum
MILKFAT	%	12.0 minimum
TOTAL MOISTURE	%	6 maximum
ASH	%	8 maximum

Infant Formula Grade WPPC Composition

Infant formula grade WPPC is specifically suited for use as a functional and nutritive ingredient in infant formula manufacture. In addition to the above composition for WPPC, Infant Formula Grade also includes:

PARAMETER	UNITS OF MEASURE	LIMITS
TOTAL PHOSPHOLIPIDS	%	4.0 minimum

Product Labeling

Recommended identifications: Whey Protein Phospholipid Concentrate

Alternative identifications: High Fat Whey Protein Concentrate

Protein Quality

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

Digestible Indispensable Amino Acid Score (DIAAS)..... 1.1 - 1.18*

**Inferred values.*

Whey Protein Phospholipid Concentrate

Functionality and Applications



HIGH PERFORMANCE:

Hydration Rate
Emulsification
Gelation

WPPC provides exceptional nutritional value and functionality for a wide variety of applications which include: ice cream, frozen yogurt, beverages, salad dressings, process cheese, protein bars, and others.



MEDIUM PERFORMANCE:

Viscosity
Water Binding
Heat Stability
Acid Stability

Whey protein phospholipid concentrate (WPPC) contains approximately 5% phospholipids (bioactive polar lipids), which can be further recovered and enriched with additional concentration and drying¹. The polar lipids in WPPC include, but are not limited to, approximately 5% phosphatidylinositol (PI), 40% phosphatidylethanolamine (PE), 12% phosphatidylserine (PS), 26% phosphatidylcholine (PC), and 17% Sphingomyelin (SM)²; these are different proportions than what is found in plants.

Polar lipids are valuable nutrients because they benefit infant development (including organ growth, cellular replication and neurobehavioral development) and adult health (including contributing to gut health, benefitting the immune system, and significantly reducing lipid cardiovascular markers with reducing cholesterol absorption)^{2, 3}.

Product Examples

(launched in the last 2 years)

Credit: Innova Market Insights



Little Brainiac Smoothies: Whey protein phospholipid concentrate (WPPC) has good heat stability and functionality for this aseptic smoothie. WPPC provides high quality protein and important phospholipids to support muscle and brain development in children.



Protos Whey Protein Blend: Whey protein phospholipid concentrate blends well with other ingredients in ready to mix applications. WPPC provides high quality protein for muscle maintenance and phospholipids for cognitive support in adults.



Enfagrow Pro A Plus Growing Up Milk for Toddlers: The composition of this infant formula is more similar to human milk because of the added whey protein phospholipid concentrate which provides a source of milkfat globule membrane (MFGM). MFGM provides important phospholipids for brain development in infants.

References:

¹ Swaminathan, A V, M S Molitor, K J Burrington, D Otter, J A Lucey. Partial enrichment of phospholipids by enzymatic hydrolysis and membrane filtration of whey protein phospholipid concentrate. JDS Communications. 4: 175-180.

² Ferraris, Q and M C Qian. Direct ethanolic extraction of polar lipids and fractional crystallization from whey protein phospholipid concentrate. JDS Communications. 2: 177-181.

³ Ozturk, G, N Liang, M Bhattacharya, R C Robinson, S Shankar, Y-P Huang, B Paviani, A Y Taha, D Barile. Glycoproteomic and lipidomic characterization of industrially produced whey protein phospholipid concentrate with emphasis on antimicrobial xanthine oxidase, oxylipins and small milk fat globules. Dairy. 3(2): 277-302.