

Concentrated Milk Proteins Standard

Product Definition

Concentrated Milk Protein products are obtained by concentrating bovine skim milk through filtration processes so that the finished dry product contains 40% or more protein by weight. Concentrated Milk Protein products may be produced by filtration, dialysis or any other safe and suitable process by which all or part of the lactose and minerals may be removed. Products cannot be produced by combining separately produced casein (caseinate) and whey proteins.

Milk Protein Concentrate (MPC) and **Milk Protein Isolate (MPI)** are produced by filtration methods (Ultrafiltration and Diafiltration) which capture essentially all the casein and whey proteins contained in the raw material stream in the finished product, resulting in a casein-to-whey protein ratio equivalent to that of the original milk, generally a value of 80:20.

Concentrated Milk Protein products may also be produced using Microfiltration, which will alter the casein-to-whey protein ratio compared to that found in milk. The casein-to-whey protein ratio typically ranges between 82:18 and 95:5 for commercially available products. Where Microfiltration is used, the resulting product is called **Microfiltered Milk Protein (MMP)** or **Micellar Casein (MC)**.

Composition: MPC and MPI

Several different MPC and MPI products are commercially available, each of which is identified by a number which represents the protein content of the product. These include:

<u>Product</u>	<u>Protein %</u>	<u>Fat %</u>	<u>Lactose %</u>	<u>Ash %</u>	<u>Moisture %</u>
MPC 40	39.5 min	1.25 max	52.0 max	10.0 max	5.0 max
MPC 42	41.5 min	1.25 max	51.0 max	10.0 max	5.0 max
MPC 56	55.5 min	1.50 max	36.0 max	10.0 max	5.0 max
MPC 70	69.5 min	2.50 max	20.0 max	10.0 max	6.0 max
MPC 80	79.5 min	2.50 max	9.0 max	8.0 max	6.0 max
MPC 85	85.0 min*	2.50 max	8.0 max	8.0 max	6.0 max
MPI	89.5 min*	2.50 max	5.0 max	8.0 max	6.0 max

(*) Protein content $\geq 85.0\%$ is reported on a dry basis, all other parameters are reported “as is”

Composition: MMP and MC

Several different MMP and/or MC products are commercially available, each of which is identified by a number which represents the protein content of the product. These include:

<u>Product MMP/MC</u>	<u>Protein %</u>	<u>Fat %</u>	<u>Lactose %</u>	<u>Ash %</u>	<u>Moisture %</u>
42	41.5 min	1.25 max	51.0 max	6.0 max	5.0 max
70	69.5 min	2.50 max	16.0 max	8.0 max	6.0 max
80	79.5 min	3.00 max	10.0 max	8.0 max	6.0 max
85	85.0 min*	3.00 max	3.0 max	8.0 max	6.0 max
90	89.5 min*	3.00 max	1.0 max	8.0 max	7.0 max

(*) Protein content over $\geq 85.0\%$ is reported on a dry basis, all other parameters are reported “as is”

Microbiological Standards and Methods of Analysis

<u>Parameter</u>	<u>Standard</u>	<u>Test Method</u>
Standard Plate Count	30,000cfu/g max	FDA BAM
Coliform Bacteria	10cfu/g max	AOAC 989.10 (Petrifilm)
Salmonella	Neg.	FDA BAM
Listeria	Neg.	FDA BAM
Yeast/Mold	100/g max	FDA BAM
Moisture	See chart	AOAC 927.05 (Vacuum Oven)
Milkfat	See chart	AOAC 989.05 (Mojonnier)
Protein	See chart	SM 15.132 (Kjeldahl)
Casein	See definition	TBD
Ash	See chart	AOAC 900.02 (Gravimetric)
Lactose	See chart	SM 15.092 (Enzymatic)

Product Labeling

Milk Protein Concentrate (MPC) is labeled to reflect the protein content of the finished product. Product labeled as Milk Protein Isolate (MPI) must contain a minimum of 89.5% protein. Microfiltered Milk Protein (MMP) and Micellar Casein (MC) are labeled to reflect their protein content.

Product Applications and Functionality

MPC, MPI, MMP and/or MC can be used as food ingredients in a variety of food categories. Depending on the food category in which the concentrated milk proteins are used, they can serve as: emulsifiers, flavor enhancers, flavoring agents, formulation aids, humectants, stabilizers and thickeners, texturizers, and sources of high-quality protein.

Storage & Shipping

Product should be stored and shipped in a cool, dry environment with temperatures below 80°F and relative humidity below 65%. Stocks should be rotated and utilized within 1 – 2 years.

Packaging

Multiwall kraft bags with polyethylene inner liner or other suitable closed container – i.e., “tote bins”, etc.