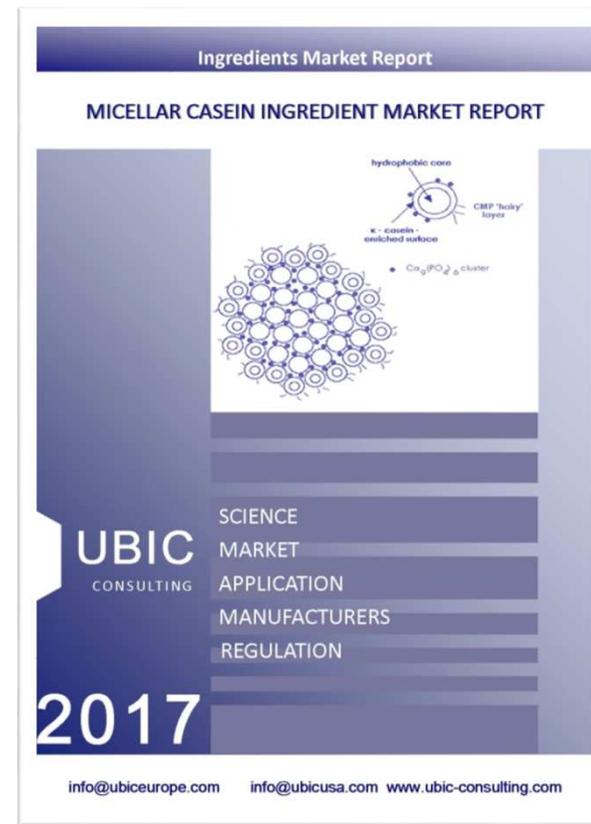
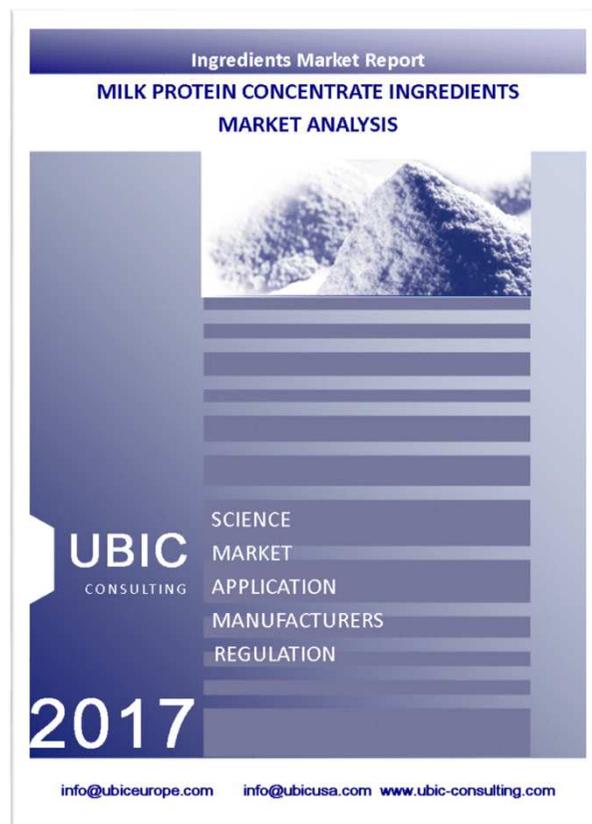


MPC – MCC INGREDIENTS MARKET REPORTS

Science Market Regulation

UBIC 2017



Marketing Development

Strategy Consulting

Partnership searches

Informations systems

What are Micellar Casein Concentrates and Milk Protein Concentrates?

*The purpose of this study is to describe the major differences between **milk protein concentrates** and **casein products**, namely **micellar casein**; explore the current and prospective applications , describe the extraction processes, the similarity and the divergence of each product which are still interesting food manufacturers.*

The world milk proteins market is valued at 1,5 billion US\$

Global proteins ingredients market evaluated to \$10 billion

Proteins today are essential in nutritional sectors

Animal protein market now challenged by plant-derived proteins due to price fluctuations and consumer attitude as consumer are more convinced of the nutritional benefit of plant proteins

Soy protein represent a very competitive product in terms of price

MPC and MCC: What's the difference?

There are two major types of proteins in milk: caseins (these stay with the cheese) and soluble proteins (beta-lactoglobulin and alpha-lactalbumin) that go out with the whey in cheese making. Of the true protein in milk about 82% is casein and 18% is soluble proteins.

Today, the quality of the protein is an important factor that influences the choice of consumer. Recently, the FAO has promoted a new measurement of protein quality, which is the Digestible Indispensable Amino Acid Score (DIAAS) . This score classify milk proteins as higher in dietary indispensable amino acids compared to other protein sources.



MPC

Milk protein concentrate (MPC) is skim milk that has been concentrated by ultra-filtration to retain most of the protein (casein and whey proteins) while removing much of the water and some of the lactose, ash and other solids.

Milk protein concentrate possess a number of technical characteristics such as solubility, high water retention, foaming and gelation.

MCC

Micellar Caseins are concentrates of the milk proteins that normally form the structure of cheese when milk is used for cheese making. Micellar Casein Concentrates are made by microfiltering milk. These are the larger proteins that do not pass through the microfilter. About 80-95% of the casein in normal milk is in the form of colloiddally dispersed particles, known as micelles.

They are very heat stable and are able to carry a large amount of calcium.

The micellar casein are low in fat and lactose-free, unlike casein which provide the mouth feel of a beverage that contains fat.

- The increasing health and wellness trend among consumers drives many food and beverages manufacturers to seek opportunities to boost the milk protein content in their products. On the other side, milk proteins producers are striving to differentiate their product by expanding MPCs functionality and improving purification process. Therefore, opportunities in new application areas are extending.
- Although their health and functional benefits, milk proteins have also a production process that is more sustainable and environmentally friendly than casein production and it yields milk permeate. As a result, demand for milk proteins is expanding and new products areas have appeared to the market. It is also predicted that milk proteins will displace casein in some specific application.

No denaturation of bioactive peptides as in whey due to low heat treatment

Better source of AA: rich in leucine, tryptophan, cysteine (have the highest Digestible Indispensable Amino Acid Score (DIAAS) = 1,18)

Increase bio-availability of Zn and Ca

Binds retinol (pro-vitamin A) and Iron

Casein based products have traditionally been used for their ability to contribute to nutritional and functional properties of foods. There are emerging opportunities to increase the use of new casein products for nutrition and functional foods such as **micellar casein** which has an impact in the future given that their physical and sensory properties compared with the others milk protein products. An attractive value-added application of micellar casein is its use in shelf-stable, high quality nutrition beverages. Micellar casein concentrate provides the mouth feel of milk with approximately 2% fat without the calories. The micellar casein is a natural nano-capsule. Hence, it may be harnessed to deliver various food ingredients including vitamins and bioactive. Cross linking of the micellar casein by transglutaminase produces nano gel particles, which also may serve as delivery vehicles in food systems.

Micellar form: increase bio-availability of protein by better absorption

Absorption occurs mainly in the small intestine

No **rejection** by the **immune system**. The micellar form is not identified as a “foreign” protein

Can be directly absorbed by the intestinal wall which is beneficial for babies

MILK PROTEIN CONCENTRATE REPORT

Milk protein concentrates (MPC) are used in a wide range of foods including ice cream, nutrition bars, processed cheese products and baked goods. A survey of milk protein product purchasers provided information on how these products are used in the U.S. market:

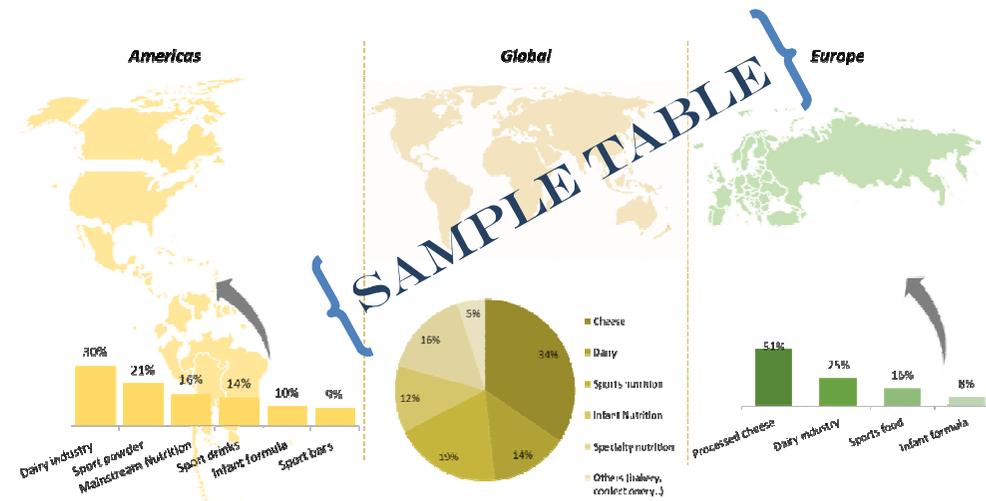
MPC purchases are dominated by two end-use applications: processed cheese products and specialty nutrition products. Over 90 percent of all MPC used in the production of processed cheese products was MPC 70-79 (mainly MPC 70).

Total world dairy protein ingredients market in 2016 was evaluated at x,xxx,xxx tons with value of xx,xxx mio \$. The world market for MPC/ MPI was estimated at xxx,xxx tons in 2016 with the US market being the largest at xx,xxx tons.

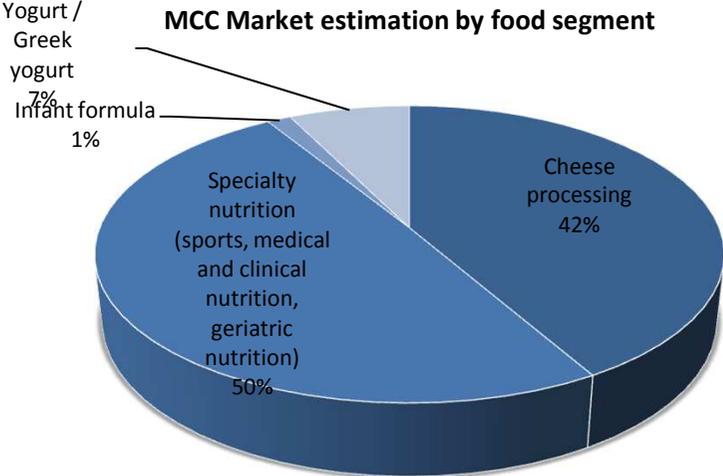


Report Main Features

- ✓ 261 pages, 52 figures, 70 tables.
- ✓ Describe the current and prospective applications of milk protein concentrates and isolates
 - ✓ Raise legislation issues
- ✓ Quantify the demand for each market segment and its evolution
- ✓ Analyse the needs and expectations of industrial users regarding these specific milk ingredients
 - ✓ Determine the key factors of success



Micellar casein concentrates are new milk protein products with no undesirable off-flavor when used as food ingredients. Because MCC are produced by a gentle process (membrane filtration), no chemicals or additives are used in the process of manufacturing, these are characterized by a very clean dairy flavor (a milky flavor). MCC are used as a source of dairy protein in prepared foods because its bland flavor allows other flavors to develop fully.



Report Main Features

- ✓ 268 pages, 19 figures, 58 tables.
- ✓ Scientific overview
- ✓ Market Evaluation by country & application
- ✓ Market trends
- ✓ Competitive landscape and key suppliers profiles

| Market segments | Functionality |
|---|--|
|  | <ul style="list-style-type: none"> • No quick reaction of the Immune system • Better digestion • Keep the amino acid levels higher for longer period |
|  | <ul style="list-style-type: none"> • Better nutritional profile • Improve texture • Increase protein content • Reduce lactose content. |
|  | <ul style="list-style-type: none"> • Cheese standardization to optimize yield • Boost the Calcium and protein content • Form and stabilized emulsions |
|  | <ul style="list-style-type: none"> • Satiety/weight • MC will be better absorbed by babies • Slower rate of nitrogen absorption than whey • casomorphine has a positive effect on the gut |
|  | <ul style="list-style-type: none"> • MC is non allergen • better absorption also mean better weight gain (sarcopenia) |

| | | The World MPC Ingredients Market Report | The World MCC Ingredients Market Report |
|----------------|--|--|--|
| | Sections | Update 2017 | Update 2017 |
| Complete study | All sections | € 4,990 | € 4,990 |
| One section | Scientific scanning- Market – Trade statistics | € 1,900 | € 1,900 |
| | Production _ manufacturers profile | € 1,900 | € 1,900 |
| | Users profiles | € 2,900 | € 2,900 |

Study purchase includes one year update available on-line on UBIC's Extranet

Assistance is also available for specific questions

COMPANY _____

Name _____ Position _____

Tel.: _____ Date _____

Signature _____

UBIC CONSULTING IN THE WORLD



| | | | |
|---|---|---|---|
| <p>UBIC USA 5020 Campus Drive NEWPORT BEACH CA- 92660 Phone : +1 949 296 7544 Fax : +1 949 752 2287</p> | <p>UBIC EUROPE TechnoArk Sierre 1 CH 3960 SIERRE Phone : + 41 (0) 27 456 1440 + 41 (0) 27 456 1444 Fax : + 41 (0) 27 456 1447</p> | <p>IRELAND Ulysses House 24 Foley St DUBLIN 1 Phone : 353 1 876 48 05 Fax : 353 1 876 48 04</p> | <p>JAPAN 2nd Floor, IBRI, 2-2 Minatojima- minamimachi, Kobe, 650-0047 JAPAN Phone: +81 50 5850 8474 Fax: +81 50 3488 4318</p> |
|---|---|---|---|