Lecithin is a complex mixture of different polar phospho- and glycolipids and neutral lipids (tryglycerides, sterine fatty acids). Due to its molecular structures lecithin has both hydrophilic, i.e. water-loving and lipophilic, i.e. fat-loving properties. This ability to interact simultaneously with oil and water is the reason why it works as a perfect, effective and stable emulsifier and dispersing agent. In addition to the technological properties Lecithin offers a wide range of physiological benefits, given by the phospholipids contained in it.

Phospholipids – as functional ingredients >
The phospholipids are the functional ingredients of all lecithins both from a technological and physiological point of view. The broader range of processes and technologies available offer the possibility to produce tailor-made functional ingredients which are used in various special food applications especially in food supplements, functional food, cosmetics and pharmaceutical application products.

Every phospholipid has its own specific application profile. Extensive scientific studies have demonstrated the effects on the human body that can result from the nutritional action of phospholipids such as phosphatidylserine as a brain cell nutrient, phosphatidylcholine for liver cell regeneration, soya phospholipids for lipid reducing effects and hydrogenated phospholipids as a basis for production of stable liposomes.
Lecithin - a perfect synergy of technology and physiology

Lecithin exists in eggs, corn, sun or rape seeds and soybeans – today, 90% of the world’s commercially available lecithin comes from soya. A quite new source is milk. LECICO has developed together with the milk producer company UELZENA, LIPAMIN M, a new milk phospholipid obtained from natural milk by a special membrane separation process without using any solvents beside water. With the special high content of about 20% phospholipids including sphingomyelin, ceramides and gangliosides, these bioactive lipids are predestinated for infant formula products.

Milk phospholipids are part of the emulsifying principle in milk, the so-called milk fat globule membrane (MFGM). The milk phospholipid is obtained from guaranteed BSE-free milk. Due to application reasons for easier formulation, the phospholipids as a concentrate (20%) are combined with a milk protein carrier to obtain a powdered product. This product has a very unique polar lipid composition which is totally different from all other phospholipid preparations on the market. A typical composition is as follows:

- Phospholipids ca. 20%
  - thereof Phosphatidylcholine 6%
  - Phosphatidylethanolamine 6%
  - Sphingomyelin 5%
  - Phosphatidylserine 2.5%
- Other polar lipids
  - Ceramides 3%
  - Gangliosides 1%
  - Triglycerides ca. 12%
  - Protein ca. 40%
  - Lactose ca. 20%
  - Minerals ca. 8%

The fatty acids in milk polar lipids are saturated by approximately 50%, monounsaturated 35% and polyunsaturated approximately 15%. It is not just one component of
this natural composition, which makes milk phospholipids so important. But as a representative for all the active ingredients, let’s describe one in detail.

Ceramides > One of the most studied roles of ceramides relates to its function as a pro-apoptotic molecule. Apoptosis, a form of programmed cell death, is essential for the maintenance of normal cellular homeostasis and is an important physiological response to many forms of cellular stress. Because of its apoptosis-inducing effects in cancer cells, ceramide has been termed the “tumor suppressor lipid”. Several studies have attempted to define further the specific role of ceramide in the events of cell death and some evidence suggests ceramide functions indeed in inducing apoptosis. However, owing to the conflicting and variable nature of studies of the role of ceramide in apoptosis, the mechanism by which this lipid regulates apoptosis remains to be studied.

Ceramides are the major lipid constituent of lamellar sheets present in the intercellular spaces of the stratum corneum. These lamellar sheets are thought to provide the barrier property of the epidermis. It is generally accepted that the intercellular lipid domain is composed of approximately equimolar concentrations of free fatty acids, cholesterol, and ceramides. Formulations containing lipids identical to those in skin and, in particular, some ceramide supplementation could improve disturbed skin conditions. The utilization of ceramide containing formulations have potential as new forms of topical therapy for dermatoses like atopic dermatitis. In summary, milk derived phospholipids like LIPAMIN M20 offer a fascinating synergy of interesting technological functions combined with an attractive range of health benefits. This makes them ideal candidates for formulation of infant formula:

- Stable against oxidation
- Bland milk taste
- Easily dispersible (as 20 % concentrate on milk carrier)
- Form stable liposomes with excellent entrapment efficiency and stability
- Good emulsifying properties (for/with other [functional] ingredients)

Sustainability and responsibility with Organic Lecithin

A healthy body in a healthy world > Beside the awareness for healthy or functional food, the awareness for sustainability and responsibility has grown up in the last couple of years, so a lot of consumers searching for ecological and organic products. As a consequence the organic market has had a tremendous development in recent years, the market for organic products has gained a solid foothold and continues to grow.

Since lecithin – in accordance with Regulations (EC) 899/2008 and (EC) 834/2007 – is on the list of permitted additives for organic foods, conventional non-genetically modified lecithin can be used in these products. As long as the prescribed amount of max. 5 % per recipe is not exceeded.
However, many manufacturers increasingly try to meet consumer desires by not using non-organic ingredients in their products. This means that the ingredients and additives used must meet the criteria and the quality requirements of environmental regulations.

For this increasing demand LECICO offers now organic soya and sunflower lecithin, which is naturally and ecologically produced and thus correspond to the complete concept of an “organic production.” In this process, the oils are cold-pressed from the seeds and subsequently the lecithin is isolated through separation of the oil. Use of any solvents during the production process has been discontinued completely.

Organic lecithin is extracted from soybeans or sunflower seeds, which are not genetically modified. In addition, these crops are grown organically, without the use of pesticides or other plant protection agents. The strict manufacturing criteria limit the produced quantity of organic lecithin compared to conventionally produced lecithin, but still, the amount of organic lecithin produced is growing by approx. 20% per year.

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