

Lecithin: boosting both performance and profitability naturally

The pandemic has caused a worldwide rise in the price of agricultural raw materials, as well as supply chain interruptions – thus adding more challenges to the list of those currently faced by dairy farmers. Others include remaining efficient and profitable, while continually improving animal welfare and establishing more sustainable procedures.

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Here, natural feed ingredients and additives with high functionality play a key role. Lecithin products, with their active component phospholipids, are virtually ticking all the boxes. They not only support a strong immune system and weight gain, but also offer ease of processing for several feed applications.

In a nutshell, the health and performance of cattle relies on the best possible bioavailability and digestibility of essential nutrients in feedstuffs.

From a feed processing point of view, a homogeneous and stable mixture, including safe and effective additives, is crucial for all stages of the animals' life. Here, phospholipids score highly for a wide range of uses.

Optimised effectiveness and feed handling

Lecithin, and here especially phospholipids used as feed additives have a number of positive effects on the animals' performance and vitality.

Their positive influence on digestive processes promotes feed conversion and daily weight gain. In this way, lecithin improves performance reserves while reducing feed costs.

Better efficient feed conversion and thus better performance also means a substantial increase in profitability. Lecithin is sustainably produced and obtained through the refining of vegetable oils from regional raw materials such as soy bean, sunflower seeds or rape seed.

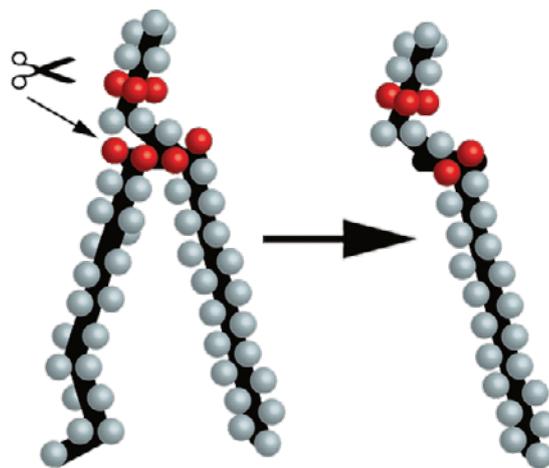


Fig. 1. Hydrolysis modification of a phospholipid molecule by an enzyme.

The process has a low CO₂ footprint, and also creates valuable by-products with numerous beneficial effects. The resulting high-quality phospholipid complexes are available in powder or liquid form, and there is a new addition to the range in the form of hydrolysed lecithin. Through enzymatic hydrolysis, phospholipids split off one fatty acid resulting in high bi-polarity.

This makes the hydrolysed lecithin suitable for a broad range of applications, including milk replacers.

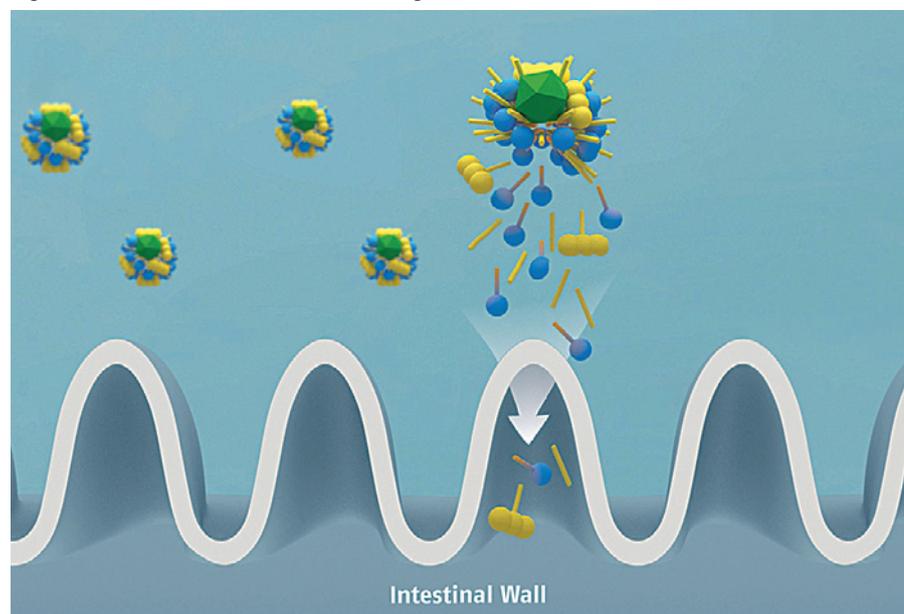
Easy to incorporate

Easy to incorporate into the production process, the non-GMO and GMP+ certified hydrolysed lecithin increases wettability, therefore improving the mixing qualities of hydrophobic powder in water.

It is also an excellent and natural emulsifier, thus keeping milk replacers stable while optimising viscosity and miscibility of raw materials.

Furthermore, lecithin gives pellets and flakes greater elasticity, while improving machine handling and production throughput by acting as a lubricant. Finally, thanks to the ingredient's antioxidant qualities, finished products have a longer shelf life.

Fig. 2. Illustration of micelles and the digestion of nutrients within the ileum.



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Emulsified fats for improved absorption

A distinctive feature of lecithin is its amphiphilic nature, with beneficial fat- and water-retaining properties. It acts as an emulsifier and promotes the absorption of fat in the intestinal mucosa.

The first step in this process is emulsification of the feed fats by bile acid in the small intestine. This turns large fat droplets into small ones, thus increasing the surface area to promote enzymatic cleavage. Adding phospholipids assists in emulsifying the fats, which in turn aids digestion.

After the feed fats are split into monoglycerides and free fatty acids, these

fat-splitting products form micelles, along with bile acid and phospholipids. The micelles transport the fat-splitting products and phospholipids to the intestinal wall, where they are absorbed.

The phospholipid content is the most important constituent of lecithin, as it is important for maintaining healthy cell membranes and essential for their proper functioning.

Supporting healthy growth of young animals

One specific phospholipid component – so-called phosphatidylcholine (PC) – also has special significance. It supplies readily available choline, which is required for synthesis of the neurotransmitter

acetylcholine, and is therefore particularly important for the nervous system. Moreover, choline acts as a methyl group donor, carrying out important functions in liver metabolism and detoxification.

The positive influence on fat digestibility is especially evident during the suckling and rearing phases. At these stages of development, the intestinal production of the digestive enzymes has not yet reached its peak.

In particular, the action of the fat-splitting enzyme lipase is inadequate. The addition of lecithin promotes the young animals' ability to digest fat, and optimises the supply of energy and nutrients during this critical phase. ■

Lecithin in milk replacer

Milk replacer comes in the form of instant powders based on fats, proteins and a range of other ingredients. To ensure homogenous and stable distribution of all nutrients (such as fat, proteins, vitamins etc) in water, it is important to choose the right emulsifier.

Lecithin is a natural emulsifier derived from sustainable raw materials. Depending on the production process and final application, it is important to choose a lecithin with the right polarity and properties.

Raw lecithin exhibits natural fluctuations and a high degree of hydrophobic properties, and is therefore not the best choice when it comes to fat-based milk powders.

Targeted standardisation and modifications – taking production and application needs, as well as raw material properties into consideration – enable customised lecithin solutions. In summary, there are a wide variety of lecithin products available, all tailored for specific and individual needs.

As well as external factors, the instant properties of powders are important, too, and are dependent on composition and structure. Wettability, sinkability and dispersibility are key parameters that determine what kind of lecithin must be used, and at which processing stage.

Milk powders are used on farms and, as a result, special conditions may occur. Not every farmer may be able to heat up water, for example. Therefore, choosing the right emulsifier for the production of milk powder is absolutely vital.

Expertise and efficiency

Berg + Schmidt, located in Hamburg, Germany, has more than 60 years of expertise in the development of optimised raw materials and ingredients for the feed industry. Its portfolio, including lecithin, fat powder and functional lipids, is developed under continuous research and customer-oriented service.

As a subsidiary of the independent, owner-managed Stern-Wywiol Gruppe, Berg + Schmidt benefits from various synergies. The company profits from the combined know-how of some 100 R&D specialists in the large Stern Technology Center in Hamburg and its extensive application technology. Customers also benefit from the group's international network: 17 subsidiaries and numerous qualified foreign representatives, jointly used production facilities and the group's own logistics guarantee high quality standards, as well as a safe and efficient supply chain.