

BestFeed

The Berg+Schmidt Newsletter



Berg+Schmidt
Functional Lipids



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BergaLac: the new rumen-stable energy supplier for early lactation

Berg+Schmidt has succeeded in developing a rumen-stable combination of carbohydrates and fats, made possible by a complex production process. BergaLac helps cows to overcome their shortage of energy in the early phase of lactation, enabling the animals to release substances necessary for milk protein synthesis.

BergaLac therefore has a positive effect on the performance of dairy cows. When used over longer periods it also increases their fertility. This applies similarly to other ruminants.

You will find detailed information on page 6.

Over 50 years of intensive research have made Berg+Schmidt one of the leading specialists in lipids

Welcome to the latest edition of our newsletter "BestFeed"!

For over 50 years Berg+Schmidt has focussed its attention on developing new and optimized lipid specialities for animal nutrition. The requirements in this field are constantly changing; we respond to the changes with innovative products for the markets of the world. In many cases our BergaFat product line – pure vegetable fat powders without a carrier – has served as a model for similar products.

Research and development enjoys very high priority in our company. It enables us to consolidate our leading position in lipids. For lipids are becoming more and more important in both animal and human nutrition.

Our latest new products are coated amino-acids and vitamins in a fat matrix. We also develop phospholipids in their different forms and concentrations.

Our applications laboratory at the Research Centre in Ahrensburg is constantly being enlarged, with modern testing equipment for vacuum and cold spraying. We cooperate closely with our customers and specialize in tailor-made formulations. Our newsletter "BestFeed" will inform you of important results of our work and new developments in animal nutrition.



We hope you will find it interesting reading.

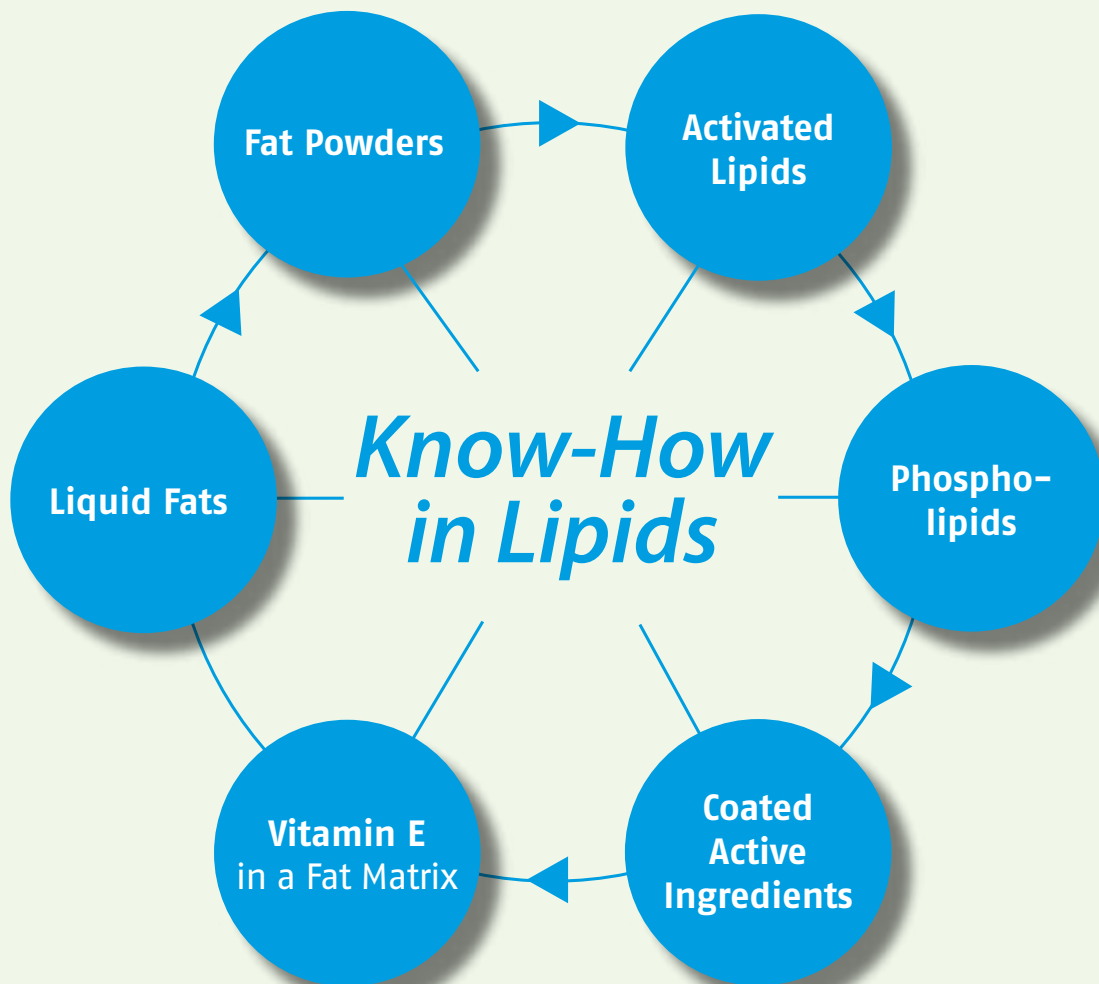
Andreas Reith
Manager, Berg+Schmidt GmbH & Co. KG

The stainless steel tank farm in Ouderkerk near Rotterdam, Netherlands



All our activities centre on our know-how in lipids

Berg+Schmidt's research scientists and applications technologists regard themselves as lipid designers. We use our knowledge of lipid technology, acquired over decades, for products in many different fields.



The precondition for developing vegetable feed ingredients of Berg+Schmidt quality is the scientific competence of our lipids research team and their knowledge of applications. This makes it possible to launch products that do much to set the standards of today's markets and technology.



The Berg+Schmidt range for animal nutrition

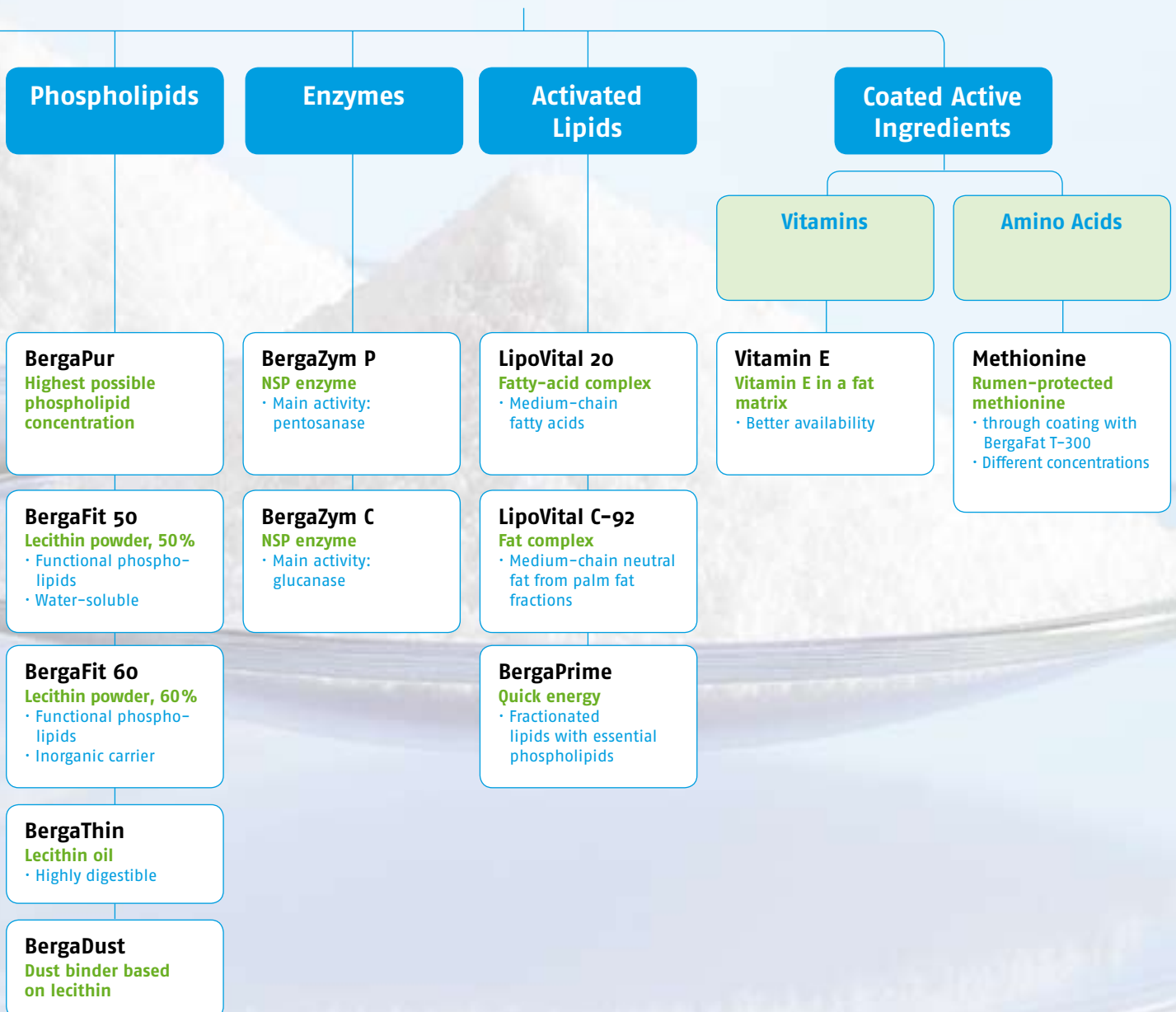
Our lipid specialities are of purely vegetable origin. We produce the fat-powder qualities – without a carrier – at our modern plant in Malaysia on the basis of selected palm oil fractions.





Berg+Schmidt

Functional Lipids



Besides the standard versions we also offer customized products. Make use of our skills!
We will be pleased to advise you.

The new generation of rumen-stable fat powders

In the early phase of lactation, high-milking cows have a gap in their energy supply because they need more energy for milk production than they can take up with their feed. To fill the gap the cows have to mobilize energy from the reserves of their own bodies; this may result in metabolic disorders.

In order to prevent such disorders, additional energy has to be provided through the feed. The additional energy requirement for milk production may be 500 g of fat or more per cow and day, depending on the animal's individual yield. But this

Rumen-stable – more than just rumen-protected

The term "rumen-protected" describes products that pass through the rumen unchanged as long as the pH remains stable.

Our fat powders are "rumen-stable"; they pass into the gut almost 100% unchanged.

Rumen-Protected	Rumen-Stable
Chemically treated	Physically fractionated
Risk if the pH drops	Independent of the pH
Not permanently stable	Permanently stable

fat must be rumen-stable in order not to impair the digestion of fibres. ◆

Continued from page 1

BergaLac

Rumen-stable energy from fat and carbohydrates, with excellent digestibility

Lactose is the third major component of cow's milk alongside fat and protein. The synthesis of lactose requires glucose. If the supply of glucose from carbohydrates in the feed is insufficient, the glycogenic amino acids are used to replenish it. So it is possible to save on amino acids if carbohydrates release glucose in the small intestine. These saved amino acids can then be used to produce milk protein.

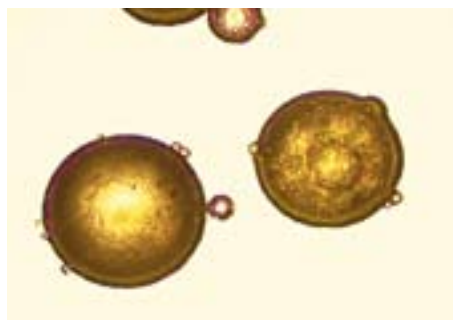
Bergalac is nearly 100% rumen-stable

BergaLac is a highly digestible fat/carbohydrate complex in powder form that is nearly 100% rumen-stable. The basis for its production is a rumen-stable palm oil fraction. This is used to encapsulate carbohydrates, which are not available to the cow until they reach the gut. At the same time the combination

achieves a digestibility of 82% for the fat components of BergaLac. The digestibility of the feed fat as a whole is increased by 8%, which permits much better utilization of the energy content of the feed. The excellent digestibility and good flavour increase the cows' feed uptake. This results in a higher milk yield, better fertility and enhanced lifetime productivity. ◆

Typical Fatty-Acid Composition of BergaLac

Myristic acid and shorter fatty acids	Approx. 1.5%
Palmitic acid	Min. 75%
Palmitic acid and stearic acid	Min. 83%
Oleic acid	Approx. 10%
Linoleic acid	Approx. 2%



View under the electron microscope. The photograph shows the fat matrix surrounding the carbohydrate particles.

BergaFat F-100 HU

More unsaturated fatty acids in a rumen-stable fat

In order to achieve a high price for their milk, farmers must keep a watch on its fat and protein content. A further important quality criterion is the fatty-acid composition of the milk fat, as it is the nature of the fatty acids that determines the spreadability of the butter made from the milk.

The feed fat determines the fatty-acid composition of the milk fat and the body fat of the cow

In the case of dairy cows this is the fat that is available to the animal after it has passed through the rumen. Rumen bacteria react sensitively to unsaturated

fatty acids; they saturate all unsaturated fatty acids from the feed to which they have access.

But the bacteria can only carry out this process partially. If their hydrogenation capacity is exceeded the bacteria are impeded by the unsaturated fatty acids and reduce their activity.

BergaFat F-100 HU helps to prevent reduction of the bacterial activity in the rumen and carry the unsaturated fatty acids into the gut unchanged; there they are absorbed and also used in the synthesis of milk fat. The result is a butter that is easily spread at room temperature. These processes constitute a real challenge to animal nutrition. In the past, rumen-stable fats

were usually produced by fractionating the saturated fatty acids in order to avoid damage to the rumen bacteria.

A fat powder based on palm fat

With the aid of complex technology Berg+Schmidt has succeeded in developing a fat powder based on palm fat that combines rumen stability with a high unsaturated fatty-acid content in a single product. It carries unsaturated fatty acids through the rumen into the small intestine without disturbing the rumen bacteria. This ensures the animal a larger amount of unsaturated fatty acids that can pass into the milk. ◆



Up to 1 euro-cent more profit per chicken BergaFat for fattening poultry: trials show it to be the superior addition to feed

Like no other process the fractionation of fats makes it possible to produce fat powders with a precisely adjusted fatty-acid composition. Berg+Schmidt confirmed the superiority of the fractionated and lecithin-activated fat powder BergaFat in a comprehensive trial carried out with broilers in cooperation with the University of Göttingen.

The effective application of feed fat to suit a particular animal species depends to a large extent on the fatty-acid pattern of the fat; this has already been demonstrated in several trials. Although the digestibility of the unsaturated fatty acids in monogastric animals is measurably high in many of these trials, the restricting effect of the unsaturated fatty acids (e.g. linolic acid, C18:2) particularly on the health and growth parameters of broilers is described in detail.

Supplementing broiler feed with fat to raise the energy level is therefore a balancing act of optimization. It is not easy to determine the birds' energy requirements and at the same time find exactly the right fatty-acid composition.

Energy for broilers through an ideal fatty-acid balance

A fat with a high percentage of palmitic acid (C16:0) that is long-chain, saturated and at the same time highly digestible offers the ideal fatty-acid balance. It supplies the broilers with the "right" energy. Lecithin-activated fat powders (e.g. BergaFat HTL-306 / HTL-316 with a lecithin content of 6 or 16% respectively) contain 75 – 85% palmitic acid (C16:0) and constitute a good basis for optimizing the broiler feed. Berg+Schmidt was able to confirm this in a comprehensive trial conducted with broilers in cooperation with the University of Göttingen. The objective

of the trial was to determine the effect of fractionated palm fat in powder form with a high percentage of palmitic acid (C16:0) as added feed fat in comparison with soybean oil. The rating criteria were fattening performance and carcass quality.

Superiority of the BergaFat groups

Throughout the trial (35 days) the superiority of the BergaFat groups over the control group with added soybean oil in respect of overall performance and state of health was observed and measured.



Broilers from the Berg+Schmidt trial

Zoological Data and Drip Loss after 48 Hours (DL₄₈)

Parameter Group	Feed Uptake [g/day]	DWI [g/day]	Finished Weight [g]	DL ₄₈ [%]
A (WS)	105.9	64.9	2318	8.5
B (S)	86.6	65.0	2324	8.5
C (S+306)	107.2	67.9	2423	6.6
D (S+316)	107.2	69.4	2475	6.9
P	0.012	0.013	0.013	0.001

A (WS) = broiler fattening feed balanced with wheat starch
 B (S) = broiler fattening feed with added soybean oil
 C (S+306) = broiler fattening feed with soybean oil and added BergaFat HTL-306
 D (S+316) = broiler fattening feed with soybean oil and added BergaFat HTL-316
 DWI = daily weight increase



This superiority of the BergaFat groups over the control group was apparent both during the trial and after slaughter:

- Higher average final weight (up to 2,500 g per broiler)
- Extra weight of up to 150 g per bird
- Higher average daily weight increase (up to 70 g per bird and day)
- Excellent carcass yield, up to 79%
- Meat with better resistance to oxidation and therefore a longer shelf-life

On average the drip loss was 2% lower than in the soy group when the various fractionated and C16:0-rich BergaFat palm fats were used. With BergaFat, poultry farmers have a product that is worth its cost in terms of profitability and offers benefits over and above the growth parameters. BergaFat makes an important contribution to sustainable quality of the meat. ◆



Lecithin: the natural functional alternative

Besides overall performance and meat quality the trial also examined the role of the lecithin contained in the fat powder. The minimum dose of lecithin was calculated on the basis of its deoiled lecithin content and in relation to the fat content of the feed. The trial confirmed that an average dose of as little as 0.35% deoiled lecithin to the broiler feed (from the first day of fattening), in conjunction with the right fat composition, resulted in a final broiler weight that was around 6% higher than that of the birds in the soy group without added lecithin.

are unable to digest the large fat content properly and use it efficiently.

Optimized energy supply and better digestion

Deoiled lecithin facilitates the emulsion and "preparation" of this fat and serves to optimize its digestion. This in turn increases the utilization of energy and promotes the digestion of other ingredients of the feed that steer the birds' growth in the desired direction and enable deliberate control of the fattening process. ◆

Deoiled lecithin combines the "technical" emulsifying and performance-enhancing effect of the phospholipids in the body with their function as a constituent of all the body cells. It offers an intelligent way of increasing the birds' performance naturally.

Higher final weight with lecithin

Whereas the percentage of fat in broiler feed has nearly tripled in recent decades, the progressively shorter life span and fattening time of the broilers leaves less room for natural adaptation of the digestive system – with the result that the birds

LipoVital C-92

The multifunctional active oil stimulates metabolism and promotes growth and well-being

LipoVital C-92 is a medium-chain, thin liquid triglyceride of fractionated vegetable fats based mainly on caprylic and capric acid. It is readily digestible, supplies quick energy and is a multifunctional active substance and unique nutrient all in one.

It therefore has ideal properties for:

- **Feeding young animals**
whose digestive system is not yet fully developed.
- **Animals in stress situations**
for example during weaning. The additional, readily available energy gives the young animal the extra boost of energy it needs.
- **Animals for sports**
that have to show outstanding physical performance (for example race-horses). LipoVital C-92 supplies quick energy.
- **Animals with digestive problems**
LipoVital C-92 also facilitates the uptake of nutrients. ◆

LipoVital 20

The functional fatty-acid complex with outstanding properties

Now that growth promoters are no longer permitted, animal nutrition has to place more emphasis on feed components that are very readily absorbed and at the same time promote the uptake of nutrients.

The products of choice are specially selected fat fractions whose properties are also used in human medicine. In order to be absorbed, fats normally have to be split into fragments with 2 C atoms from which they are then re-synthesized to form higher fats. In the case of the group of medium-chain fatty acids with 8 to 10 C atoms, and their triglycerides, this is not necessary. They can be absorbed without being split into C-2 fragments.

This property makes it possible to provide even young animals whose digestive systems are not yet fully developed with energy and fat-soluble vitamins. Whereas medium-chain triglycerides have a neutral odour and taste and also excellent han-

dling characteristics, free medium-chain fatty acids are highly aggressive and have an extremely intensive smell. This undesirable attribute is eliminated by attaching metal ions to the fatty acids.

LipoVital 20 is rich in medium-chain fatty acids

Berg+Schmidt uses this method to produce a powder rich in medium-chain fatty acids from specially fractionated coconut oil.

LipoVital 20 is virtually odourless and so easy to handle that it can be added without complex technical equipment during the production of compound feed.

LipoVital C-92 Multifunctional Active Oil

Physical properties:

- Colourless to yellowish fluid
- Neutral odour
- Low viscosity
- High resistance to oxidation
- Good cold resistance
- Slightly polar

Nutritional properties:

- Highly digestible – can be absorbed directly
- Quick supply of energy
- No storage as depot fat
- No increase in the cholesterol level
- Improves the uptake of fat-soluble vitamins

Important auxiliary substance in animal nutrition:

- Solubilizer
- Releasing agent
- Viscosity regulator
- Carrier and conveyor, e.g. for fat-soluble vitamins

The use of selected fatty acids in this neutralized powder form has several advantages:

- Unlike the aggressive free fatty acids the powder is odourless; it can be added to feed without danger, using simple technical equipment.
- In the digestive system the fatty acids are released again so that they can be absorbed.
- The free fatty acids can also have a positive effect on the pH in the gut.
- A further side effect is that various micro-organisms react to the free fatty acids; this can have a positive effect on the animals' well-being and performance.
- The mixing and storage equipment is not damaged. ◆

News in brief



Successful re-certification

Berg+Schmidt was re-certified in September 2006. The quality systems were successfully audited and assessed by Lloyd's Register Quality Assurance according to ISO 9001:2000 and GMP B2 2006 (Quality Control of Feed Materials). So Berg+Schmidt is now certified according to:

- ISO 9001:2000
- HACCP
- GMP B2
- QA. ◆

Berg+Schmidt is part of a highly successful group of companies

Berg+Schmidt is a member of the Stern-Wywiol Gruppe, a family business specializing in Food & Feed Ingredients. With 350 employees, 10 companies in Germany and 8 foreign affiliates the group currently generates an annual turnover of more than 200 million euros. The latest member is SternVitamin GmbH & Co. KG in Ahrensburg, that specializes in vitamin and mineral premixes for use in the food industry. The group has enlarged its network of affiliates by establishing offices of its own in St. Petersburg (Russia) and Hangzhou (China). ◆

BergaZym is successful in over 30 countries

BergaZym stands for NSP enzymes that release otherwise inaccessible nutrients from the cell walls of vegetable material by breaking down non-starch polysaccharides (NSPs). BergaZym is exported to over 30 countries. Our success is based on:

- Good heat stability
- Wide pH tolerances
- High concentration of the active ingredient
- Low dosage

The microgranulate makes the enzyme easy to use in poultry or pig feed, even under extreme weather and production conditions. For special production batches we also supply pack sizes containing the exact dose required. ◆



"Lecithin is Life": more and more important for animal nutrition too

No other product has been so important in the history of our group of companies as the phospholipids. Volkmar Wywiol, the founder and owner of the Stern-Wywiol Gruppe, has been working in this field for over 50 years and has contributed greatly to the worldwide use of lecithin. It is only in recent years that lecithins have established themselves as metabolism regulators in animal nutrition, and in this context the deoiled lecithins (BergaPur) play a leading role. The company has been able to meet the increasing demand successfully by setting up a lecithin deoiling plant of its own in India. ◆



Innovation management: tips from Thomas Alva Edison

Thomas Edison, the inventor of the electric light bulb, is a mine of information on how to make innovations succeed. His four stages of innovation management are a valuable guideline to this day:

1. Search for ideas

The best way to find a good idea is to have a lot of ideas. Edison increased his number of ideas by setting an "idea rate" he had to achieve. He also thought in terms of analogies and erratic leaps and tested his ideas. Most of all he enjoyed trying out things the experts had advised him not to do.

2. Develop ideas

When Edison was convinced that an idea had potential he refused to give up until he had implemented it. His belief was that "giving up too soon is our greatest weakness".

3. Market ideas

"What can't be sold is not worth inventing." That was the motto by which Edison rated each of his ideas. He asked himself whether he was creating a benefit and solving a problem.

4. Develop a business model

Thomas Edison wanted his ideas to bring him success. So it went without saying that he sought the best business model for any idea. ◆

Berg+Schmidt will be pleased to send you detailed specialist information



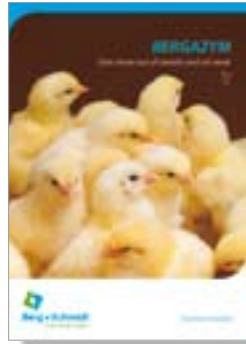
Full product range
Lipids and Enzymes

Languages	Number
German	_____
English	_____



BergaFat
Fat powder, 100%, for chickens, pigs and ruminants

Languages	Number
German	_____
English	_____



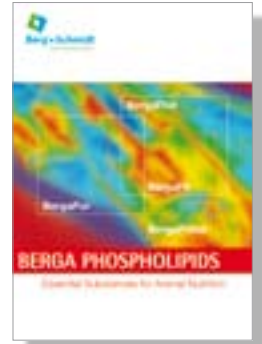
BergaZym
Enzymes for poultry

Languages	Number
German	_____
English	_____



BergaZym
Enzymes for pigs

Languages	Number
German	_____
English	_____



Berga-Phospholipids

Languages	Number
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BergaPur
Phospholipid Complex

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