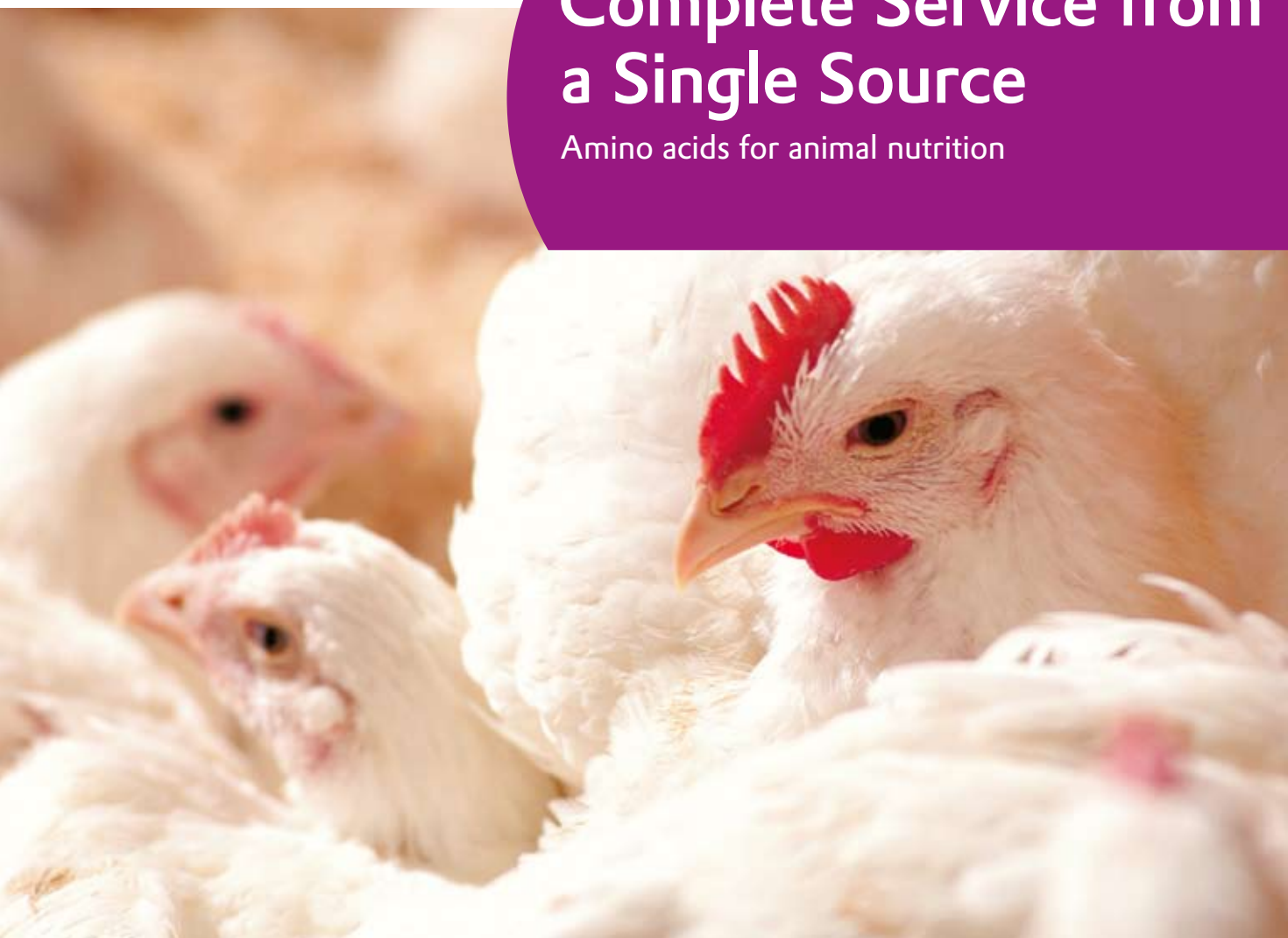


# Complete Service from a Single Source

Amino acids for animal nutrition



*As the world's population keeps growing, so does the demand for meat, milk, and eggs. That's why the animal feeds industry relies on amino acids as feed supplements, because balanced nutrition in animals means healthy nutrition in humans. Evonik Industries produces the four most important amino acids for animal nutrition, thus making a significant contribution to sustainable nutrition of the world's population.*

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**Evonik. Power to create.**

Like vitamins, amino acids are essential to human and animal life because all proteins are built up from them. Whether in muscle, hair, or skin, proteins are necessary for existence, to maintain basic metabolic functions. There are in all more than 20 different amino acids, most of which are made by the body itself.



The Health & Nutrition Business Unit produces amino acids for animal nutrition at six production sites in five countries. In addition to Antwerp (see photo, left) these are Wesseling (Germany), Mobile (Alabama, USA), Kaba (Hungary), Slovenska Ľupča (Slovakia), and Blair (Nebraska, USA). The products are distributed in well over 100 countries.

But there are exceptions: Depending on the particular organism, eight to ten of the essential amino acids are not produced by the organism and must be supplied in food, every single day. Amino acids can be stored only to a limited extent and with an unbalanced diet are easily converted into fat. It is only when these substances are present in the food daily that the body stays healthy and functional. If amino acids are not available in adequate quantity, protein synthesis is stalled; this can lead to development of deficiencies.

### **The food chain is key**

Evonik Industries is making an important contribution to healthy nutrition. It is the only company in the world to produce and market the four most important amino acids for the advanced animal nutrition: DL-Methionine, Biolys® (L-Lysine), L-Threonine, and L-Tryptophan. As additives to animal feeds they are vitally important because natural feeds such as wheat, corn, soy, and peas are all deficient in one or more amino acids. A broiler fed exclusively on plant protein, for example, is deficient in methionine.

Feeds containing wheat result in a marked deficit of lysine and threonine as well as methionine. Supplemental amino acids can fill the gap very efficiently, significantly improving animal nutrition. Evonik has systematically expanded the product range to provide expert total solutions that meet customers' needs: "We don't just sell amino acids but rather offer an entire package of innovative systems, from amino acid analysis at the customer's location to comprehensive quality control. This is how we differentiate ourselves from the competition," says Dr. Reiner Beste, head of Evonik's Health & Nutrition Business Unit, explaining the strategy. Growth prospects are particularly bright for DL-Methionine, and Evonik has recently expanded production capacities in this area. Since November 2005 the company has been operating the world's largest methionine plant in Antwerp with an annual capacity of 120,000 metric tons of DL-Methionine. The plant is also setting new standards in the area of backward integration, obtaining all the important precursors such as acrolein and methyl mercaptan from its own raw materials production facilities. "This ensures the highest degree of production efficiency as well as environmental safety and supply security," says Beste.



Amino acid analytics: sample preparation in the autosampler.

### **Balanced provision of amino acids is key**

The right mix and the correct quantities of amino acids are crucial for healthy and effective nutrition, because a chain is only as strong as its weakest link. A key factor here is the amino acid present in the smallest quantity in relation to the animals demand: its content determines the nutritive value of a protein.



In feeds based upon cereals such as wheat or corn, large amounts of soy bean meal and fish meal must be added to the feed to ensure an adequate supply of amino acids for a broiler, for example. Although a feed of this type has high protein content, only a part of this protein can be used to produce milk, egg or meat. With supplemental amino acid, on the other hand, even small percentages allow a feed containing more cereals and less protein.

The decisive advantage here is that for each kilogram of weight gain in the animal, only about half as much nitrogen is released in the manure, and hence into the environment, as for feeds with high protein content. This is extremely important because more than one fifth of agricultural land in the EU already has a considerable nitrogen surplus, posing a hazard to groundwater through high nitrate loads. "Taking as an example pork production over the entire EU, it is possible, with the appropriate use of amino acids, to eliminate as much as 300,000 metric tons of nitrogen in manure. This corresponds to almost one quarter of the total load," says Thomas Kaufmann, who is responsible for marketing of the four amino acids for animal nutrition.

### **A chance to save a million metric tons of crude oil**

Under current EU conditions, one kilogram of methionine replaces 160 kilograms of soy bean meal, which would represent a considerable reduction in imports into the European Union. The eco-balance for methionine, as determined by the well-known IFEU (Institute for Energy and Environmental Research) in Heidelberg, confirms the positive impact on the environment. According to this study, DL-Methionine not only reduces overfertilization of soils but also lowers energy consumption to one sixth compared with the use of soy bean meal. The reason is that when DL-Methionine is added to feed, more locally grown wheat can be used as a nutrient source instead of imported soy bean meal. This dispenses with the need for energy-intensive soya imports from the main producing countries, USA, Brazil, and Argentina, where, moreover, the need for agricultural land continues to increase. It also reduces CO<sub>2</sub> load: If Evonik's DL-Methionine plants are operated at full capacity; the substitution could save 14 million metric tons of CO<sub>2</sub> annually.