

The future of livestock production

EVONIK ANIMAL NUTRITION – PRODUCT AND SERVICE OVERVIEW



 **EVONIK**
POWER TO CREATE

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THE FUTURE OF LIVESTOCK PRODUCTION

Evonik Animal Nutrition – Product and service overview

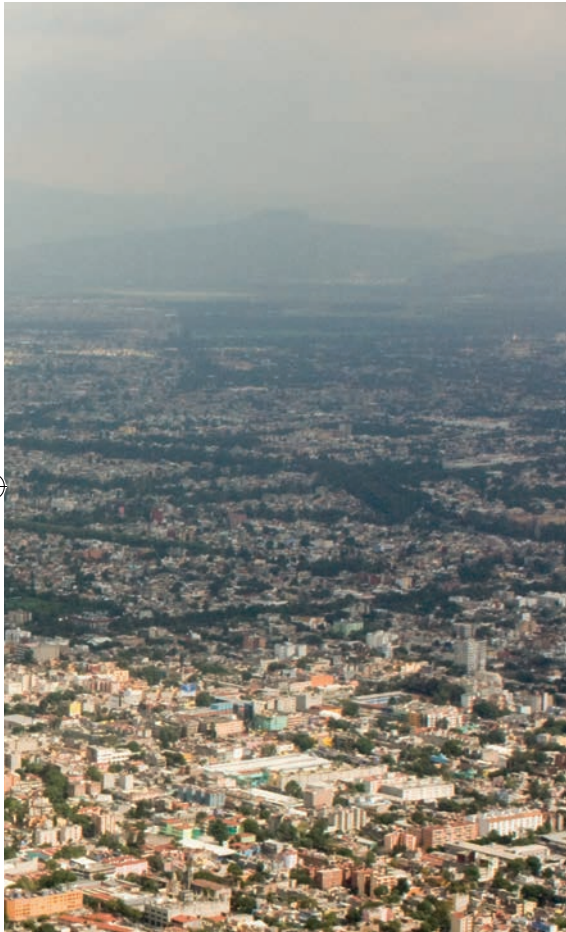
EVONIK ANIMAL NUTRITION

Better feed for better food: the science of animal nutrition is one of the keys to efficient and sustainable livestock production. And our cutting-edge feed additives, services and software solutions play an essential role in the process. Our proven holistic approach consistently supports superior feed conversion, animal welfare and profitability.

THE TASK:

FEEDING AN EVER-GROWING
WORLD POPULATION WHILE
KEEPING THE ENVIRONMENT
HEALTHY

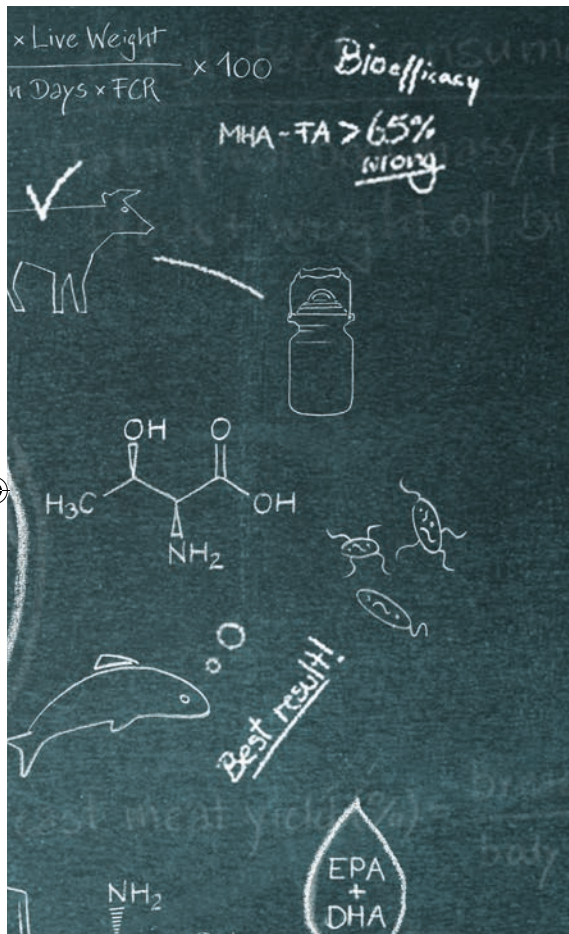




YOUR PARTNER FOR OPTIMIZED LIVESTOCK PRODUCTION

Evonik Animal Nutrition is a highly reliable, globally operating provider of science-driven products and services for sustainable and efficient production of meat, fish, eggs and milk. The organization is marked by scientific excellence and sensitivity to the needs of our customers and society.

Food security is not a given – even in industrialized countries. Climate change, political disruption, and global trends like urbanization, migration and rising animal protein demands, resulting from increasing affluence, all add to the challenge. The task of feeding an ever-growing world population while keeping the environment healthy calls for innovative solutions.



SCIENCING THE GLOBAL FOOD CHALLENGE

There is no single silver bullet when it comes to feeding future generations. It will take a concerted effort involving governmental, NGO, academic and business stakeholders on a worldwide scale. It will take a can-do attitude: if we all do what we can and contribute in our own way, humankind can overcome one of the biggest obstacles we face.

This is why Evonik sees feeding growing populations not as a food crisis in the making, not as a food gap, but rather as a challenge. A global food challenge; let's science it.



Scan the QR code to watch the Evonik Animal Nutrition video.



**THE OPPORTUNITY:
CONTINUE TO
OPERATE PROFITABLY**



QUANTITY MEETS QUALITY

The global food market is changing; growing consumer awareness of healthy nutrition and the environmental impact of food production is giving rise to new challenges and opportunities. Especially in terms of meat, fish, eggs and milk, people expect both quality and quantity. This – coupled with price sensitivity and distrust toward the livestock production industry – places farmers and feed producers under pressure.

At the same time, the current market environment opens up opportunities for those who can meet these high expectations – and continue to operate profitably. In the following pages, you will find winning solutions that harness science to give the best of both worlds to you, your customers and the end consumers.

AMINO ACIDS for optimum animal nutrition

THE BUILDING BLOCKS OF LIFE: AMINO ACIDS ARE THE ESSENCE OF A HEALTHY, GROWTH-SUSTAINING DIET.

For decades, Evonik has played a pioneering role in the development and application of easy-to-handle amino acid livestock-feed supplements of unsurpassed purity.

Alongside the essential methionine, we provide the full spectrum of amino acids to enable perfectly balanced diets for each livestock species and growth stage.



MetAMINO®

ESSENTIAL

Ideal for ensuring an adequate supply of sulfur amino acids, particularly the essential amino acid methionine, MetAMINO® is the product of choice featuring unsurpassed purity and easy handling. As the first-limiting amino acid in typical poultry diets, methionine is well established in laying and broiler production. MetAMINO® has also shown excellent results in diets for piglets and growing pigs, where considerable deficiencies in methionine can occur, especially when feed is formulated to reduce nitrogen excretion for ecological reasons. Such deficiencies can be easily and cost-effectively compensated for with MetAMINO®.

Biolys®

AMINO ACIDS IN BALANCE

Biolys® the highly effective and reliable source of lysine, enables unsurpassed precision in balancing amino acids. Along with lysine, Biolys® contains nutritionally valuable biomass and energy. The result is lower feed costs for pigs, poultry and aquatic species.



ThreAMINO®

OPTIMUM PROTEIN UTILIZATION

Supplementing feed with L-threonine, an essential amino acid that cannot be formed by the animal, supports optimum protein synthesis and muscle deposition. Threonine is known to be essential for maintenance of gut health and function, leading to better animal welfare and improved feed utilization. The benefit: optimum utilization of protein sources, reduced nitrogen excretion and lower feed costs.

TrypAMINO®

REDUCED PROTEIN INTAKE

Targeted use of TrypAMINO® allows significant reductions in feed protein intake. The 100% digestible source of L-tryptophan, an essential amino acid that animals are unable to produce, TrypAMINO® supports optimum protein synthesis. Scientific research and field trials demonstrate the effectiveness of tryptophan, which is typically the third-limiting amino acid in modern swine diets and helps to counterbalance stress.

ValAMINO®

FILLING THE GAP IN IDEAL-PROTEIN DIETS

Evonik has developed ValAMINO® in response to a specific need to further reduce protein in pig and poultry diets. ValAMINO® supplementation ensures optimal amino acid profile in low protein diets because valine quickly becomes the performing limiting amino acid.



AMINO ACIDS FOR RUMINANTS

In ruminant nutrition, supplemental amino acids must be protected against microbial degradation in the pre-stomach rumen system. For this reason, Evonik's DL-methionine supplement Mepron® is equipped with a time-release film coating. Rumen-protected Mepron® delivers methionine in a highly concentrated form, ensuring that the nutrient arrives in the small intestine to be absorbed.



METHIONINE FOR SHRIMP AND PRAWNS

Thanks to its unique low leaching properties and slow release in the gut, AQUAVI® Met-Met has a higher nutritional value than any other methionine source available today. This means the specially designed peptide AQUAVI® Met-Met not only reduces costs, but also preserves the methionine content of your feed in the water and enhances it in the gut. The optimized diet enables better growth and higher feed efficiency.

BALANCE THE DIET

OPTIMUM ANIMAL PERFORMANCE CAN BE ACHIEVED BY SUPPLYING ALL AMINO ACIDS IN THE FEED ACCORDING TO THE IDEAL PROTEIN CONCEPT.





NATURE'S TASK FORCE FOR GUT HEALTH: Probiotics

**DEMAND FOR ANIMAL WELFARE AND ANTIBIOTIC-FREE ANIMAL FEED
LEAD TO WHOLE NEW CHALLENGES.**

Beneficial, sustainable, science-based probiotics from Evonik effectively support a healthy bacterial balance in the digestive tract and ensure effective utilization of nutrients supplied in feed. Probiotics are a key component in an effective response to the increasing demand for animal welfare and antibiotic-free production.

Ecobiol®

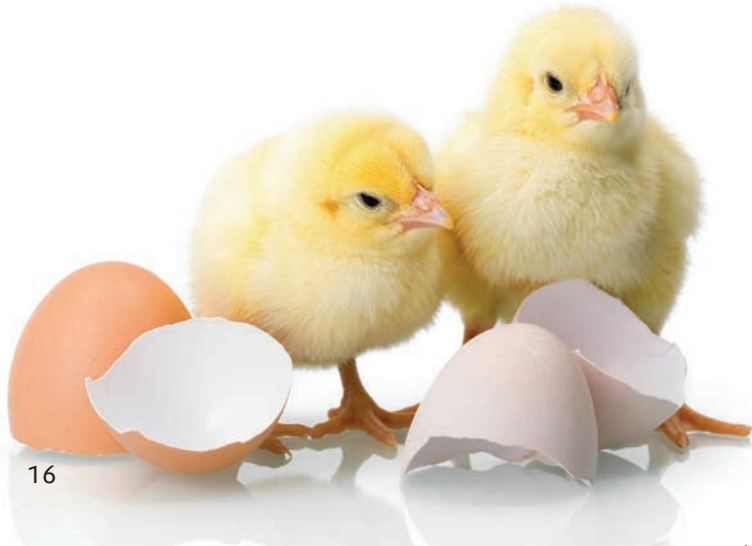
STABILIZING THE GUT FLORA

Based on a natural fast-growing *Bacillus amyloliquefaciens* CECT 5940 strain, Ecobiol® can improve the gut health of the animal and help producers solve quality, profitability and sustainability challenges.

GutCare®

FOR A HEALTHY MICROBIAL BALANCE

GutCare® is a direct-fed microbial solution based on a spore-forming *Bacillus subtilis* DSM 32315 strain with an inherent capacity to produce a variety of secondary metabolites. It supports a more balanced intestinal microbial population in the gut.



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GutPlus®

FOR INTENSIVE FARMING OPERATIONS

GutPlus® contains the patented Evonik strain *Bacillus subtilis* DSM 32540. GutPlus® resists the passage through the gastric tract and takes effect within the intestinal environment, where it effectively supports a balanced microbiome and contributes to growth.

Fecinor®

FOR HEALTHY PIGLETS AFTER WEANING

Fecinor® is a feed additive which consists of a natural fast-growing *Enterococcus faecium* CECT 4515 strain. Fecinor® supports intestinal health and benefits the host due to its capacity to produce lactic acid.

BENEFICIAL PROBIOTICS

SUPPORT THE ANIMAL'S GUT HEALTH TO MAINTAIN AN ANTIBIOTIC-FREE PRODUCTION.





SERVICES FOR EFFICIENT livestock production

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EVONIK OFFERS A RANGE OF TAILORED SOFTWARE TOOLS, AND ANALYTICAL & HANDLING SERVICES ALLOWING YOU TO SELECT, PRECISELY FORMULATE AND PRODUCE THE OPTIMAL DIET DEPENDENT ON SPECIES AND AGE PHASE.
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In addition, we provide cutting-edge Precision Livestock Farming (PLF) software and whole flock DNA test solutions. This holistic portfolio is rounded off with news and information services covering the latest animal nutrition topics.

Your benefit: complete support for cost-effective, healthy and efficient livestock production.

PRECISION LIVESTOCK FARMING

ANALYTICAL SERVICES

NUTRITION

HANDLING SOLUTIONS

KNOWLEDGE

PRECISION LIVESTOCK FARMING

Porphyrio®

THE POWER OF BIG DATA FOR YOUR POULTRY OPERATION

Porphyrio® provides innovative software solutions to optimize management of chicken, turkey and duck farming as well as egg production. The cloud-based systems use self-learning algorithms to process big data and enhance safety, reliability and accuracy throughout your farming operations.

ScreenFloX®

MONITORING EXPERTISE AT YOUR FINGERTIPS

Monitor your flocks before health and food safety issues arise: the reagent system allows for the quantification of total DNA of *Clostridium perfringens* type G, *Salmonella enterica*, *Campylobacter jejuni* in real time. The test kits includes a heterologous amplification system (internal control) to identify possible PCR inhibition and to confirm the integrity of the assay reagents. As an environmental monitoring solution, ScreenFloX® puts you in a position to take early action and protect your flock long before a health issue arises.

OPTIfarm

PRECISION SUPPORT AND OPTIMIZATION SERVICE

OPTIfarm makes real-time recommendations to clients, tailoring its service to help overcome specific challenges on farms. We deliver our service using pictures, videos, voice calls, sensors, Eyenamics technology, vet reports, factory kill information and parent flock data. We help make changes when they are needed – any time, day or night. The service maximizes the benefits of using humans and software combined.



Evonik Precision Livestock Farming (PLF) means using advanced technologies to help optimize every stage of livestock production – animal nutrition, health and farming in one holistic approach. We combine science-based aspects of poultry production with software algorithms and seamless connectivity to help deliver solutions before real problems occur.

By creating a “flock” approach, we enable farmers to deliver better results – in terms of quantity, quality and sustainability – in livestock farming. Our support offers deeper understanding of the production process along with help in optimizing diets and enhancing animal welfare. As a positive side effect of PLF, farmers can significantly reduce the environmental impact of their operations. The net result of Evonik PLF: higher efficiency, better margins and improved livestock performance.

ANALYTICAL SERVICES

AMINONIR®

ALL PARAMETERS FROM ONE SCAN

The fast and reliable analysis service AMINONIR® uses near infrared spectroscopy (NIR) to predict the crude protein and amino acid content in more than 60 important feed ingredients. Samples can be processed through onsite NIR equipment, preferably Bruker or Foss, or alternatively sent to Evonik labs. It works for ground and unground ingredients.

AMINONIR® AA

FAST AND EASY FEED INGREDIENT SCREENING

Evonik has developed specific calibrations for the prediction of crude protein, dry matter, essential and non-essential amino acids for all major feed ingredients, compiled in AMINONIR®. A large and diverse set of globally sourced samples form the basis of the tool. The advantages of AMINONIR® are easy sample preparation, speed and low operating costs, allowing you to carry out extensive feed ingredient screening programs at moderate expense.



AMINONIR® NRG

ENERGY CHECK

AMINONIR® NRG allows quick and reliable estimates of important energy parameters in feed ingredients and finished feeds. Readings include gross energy, apparent metabolizable energy (AME_n) for poultry (broiler, turkey, duck, layer), digestive energy, tmetabolizable energy and net energy for growing pigs and sows.

AMINONIR® Prox

PREDICTIVE FEED ANALYSIS

Using near-infrared technology, AMINONIR® Prox predicts nutrients from proximate analysis and phosphorus in raw feed materials as well as in feed mixes for poultry (broiler, turkey, duck and layer) and pigs (sow, weaner, grower, finisher).

AMINONIR® RED

FAST AND RELIABLE FEED ANALYTICS

Deeper understanding of soya and distiller's dried grains with solubles (DDGS) products and a precise evaluation of their quality through our AMINONIR® RED service allows more accurate feed formulation for more consistent long-term livestock performance. The service uses NIR analytics to estimate the Processing Conditions Indicator (PCI) of raw material samples – quickly, reliably and conveniently. Your benefit: ensured feed quality and better purchasing decisions.

AMINOLab®

THE GOLD STANDARD

With AMINOLab®, you can reliably determine the total amino acid, dry matter and crude protein content in your feed ingredients and finished feeds. At three lab locations in China, Germany, and Singapore – representing internationally unsurpassed animal nutrition laboratory capacity – we perform sophisticated analyses with exceptional accuracy. Using globally recognized wet-chemistry methods, our experts evaluate samples and return findings on a timely basis, enabling nutritionists, purchasers, quality control and livestock production managers to make informed decisions.

Analytical Data Advanced

ONE ACCESS POINT FOR LAB DATA

To provide customers with a single easy access point for all of their proprietary lab data, Evonik has established *Analytical Data Advanced (ADA)*, a secure, web-based platform accessible through our customer portal. The system is highly flexible, allowing users to filter data by feed ingredient or time-frame and configure the data columns as required. ADA notifies the customer by e-mail whenever new lab results become available.

AMINOInsight®

ONGOING QUALITY CONTROL

By enabling you to quickly identify the values hidden in large datasets of feed ingredients, AMINOInsight® lets you easily recognize if the quality of a feed ingredient is changing over time or if the quality of a certain supplier is superior. With feed ingredient costs representing the single largest cost position in feed milling and animal production, controlling feed ingredient quality and evaluating different sourcing options are essential to profitability.



We have **more than 10 labs on five continents** that provide NIR and wet-chemistry services, placing leading analytical capacity for amino acids and other nutrients at your disposal.

NUTRITION

COMING
SOON

AMINODat® 5.0

COMPREHENSIVE FEED INGREDIENT DATA

The most exhaustive and up-to-date nutritional database of feed ingredients in the world, AMINODat® 5.0 contains data from more than 140 feed ingredients used by the feed industry. With more than 530,000 analytical results, AMINODat® 5.0 gives you an informational edge.

AMINOPoultry®

FORWARD-LOOKING RECOMMEN- DATIONS FOR POULTRY FEED DESIGN (BROILER AND HENS)

A software tool to predict optimum digestible amino acid contents in poultry feed, AMINOPoultry® operates with user-defined input variables. The system employs a completely revised set of scientific data and includes an additional feature that allows you to calculate optimum dietary amino acid contents based on the methionine source, its supplementation rate and the nutritional value.

AMINO*Pig*[®]

FEED RECOMMENDATIONS FOR GROWING PIGS

The software tool AMINO*Pig*[®] provides amino acid and energy recommendations for growing pigs. It enables you to simulate your particular production conditions by selecting the genetic lean gain, sex and body weight of the pigs and the dietary net energy (NE) content.

AMINO*Cow*[®]

COMPANION FOR MEPRON[®]

An easy-to-use and powerful tool for dairy cow ration formulation and evaluation, AMINOCow[®] supports amino acid balancing with Mepron[®], the rumen protected methionine.

AMINO*Aqua*[®]

AQUACULTURE SOFTWARE (CARP, SALMONID, SHRIMP, TILAPIA)

Four targeted software tools for quick and easy amino acid recommendations. By simulating production scenarios based on various operation-specific features, the tools allow you to optimize your feed mix for cost-effective production of different aquatic species.

HANDLING SOLUTIONS

AMINOSys®

COMPREHENSIVE FEED-MILL SYSTEMS

Consulting, hardware and software solutions for micro-ingredient handling and dosing in feed mills: the AMINOSys® equipment range offers flexible solutions for fully automated direct dosing and conveying of amino acids from bulk storage to your batch mixing line. Comprehensive engineering and commissioning support ensure maximum benefit for the feed mill.

AMINO*Batch*[®]

MIXING QUALITY CONTROL

By analyzing supplemented amino acids in 10 compound feed samples out of one batch of feed, AMINO*Batch*[®] gives you a clear and realistic indication of whether your mixer is operating effectively, evaluating amino acid variation in assays obtained with high analytical accuracy. The AMINO*Batch*[®] test helps you produce homogeneous compound feed, supporting uniform and consistent animal performance.

AMINO*Batch*[®] WPT

ONE TEST FOR ALL

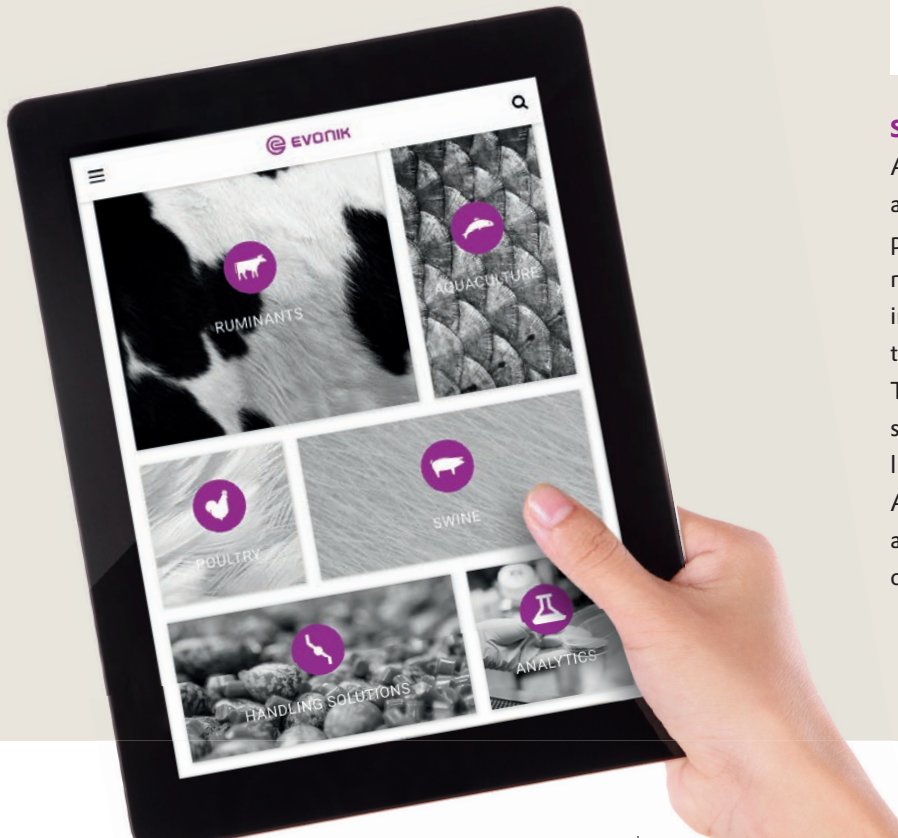
The unique tool AMINO*Batch*[®] Working Precision Test delivers comprehensive data on the working precision of the dosing and mixing lines for all amino acids in the process in one single test. The working precision test provides results for the application of dry and liquid additives in the same mixing line under comparable conditions.

AMINO*Trac*[®]

VENDOR MANAGED INVENTORY

To ensure on-time replenishment of amino acids silos we provide AMINO*Trac*[®] – the Evonik service for vendor managed inventory and optimization and replenishment optimization. Filling levels of silos are remotely monitored. Based on forecast scenarios, optimal replenishment is scheduled and alerts are triggered to ensure timely call-off or deliveries.

THE LATEST KNOWLEDGE



AMINONews®

STAY UP TO DATE

AMINONews® translates scientific data and experience into practical solutions, providing informational updates on nutritional topics for the feed industry, integrated livestock and poultry operations, consultants and universities.

The content is specifically selected to support decision-making processes in livestock and feed-milling operations. AMINONews® is available on Google and Apple app stores, as well as on our website.

Facts&Figures

APPLIED SCIENCE, PRACTICAL INSIGHTS

Our *Facts&Figures* (scientific papers) reveal information on trial results, executive summaries on scientific findings and discussions on nutritional and feeding trends. The information is normally condensed to two to four pages.

AMINO*Footprint*[®]

REDUCE ENVIRONMENTAL IMPACT

Develop diets with the lowest-possible environmental impact using AMINO*Footprint*[®]. The web-based app runs on notebooks and tablets.

Note: Not all products and services are available in all geographical regions. Please contact your Evonik representative for further information.

KNOW YOUR
SUSTAINABILITY!

SOCIAL MEDIA



Follow us on LinkedIn:
Evonik Animal Nutrition

THE RIGHT SUPPORT for your needs

Whether you run a feed mill or livestock operation, whether you produce meat, dairy products, eggs, fish or shrimp, Evonik can provide essential support. Let's talk about what our targeted feed additives, software tools, services and experience can do to take your business to the next level – and set you apart from competitors.

EVONIK NUTRITION & CARE GMBH

Animal Nutrition Business Line

animal-nutrition@evonik.com

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