

# Field Trip Animal Nutrition

## Evonik Nutrition Roadmap

**Dr. Reiner Beste**  
**Head of Nutrition & Care Segment**  
Antwerp, 1 October, 2015



**EVONIK**  
INDUSTRIES

# Segment Overview

## The Nutrition & Care playing field



### Segment Nutrition & Care

#### Consumer Goods



Cosmetics  
Body Care  
Hygiene  
Laundry Care

#### Nutrition



Animal Nutrition  
Human Nutrition

#### Health Care



Pharmaceutical  
Ingredients  
Controlled Drug  
Release

#### Specialties



Insulation for home  
appliances  
Furniture & bedding  
Release Coatings

# Segment Overview

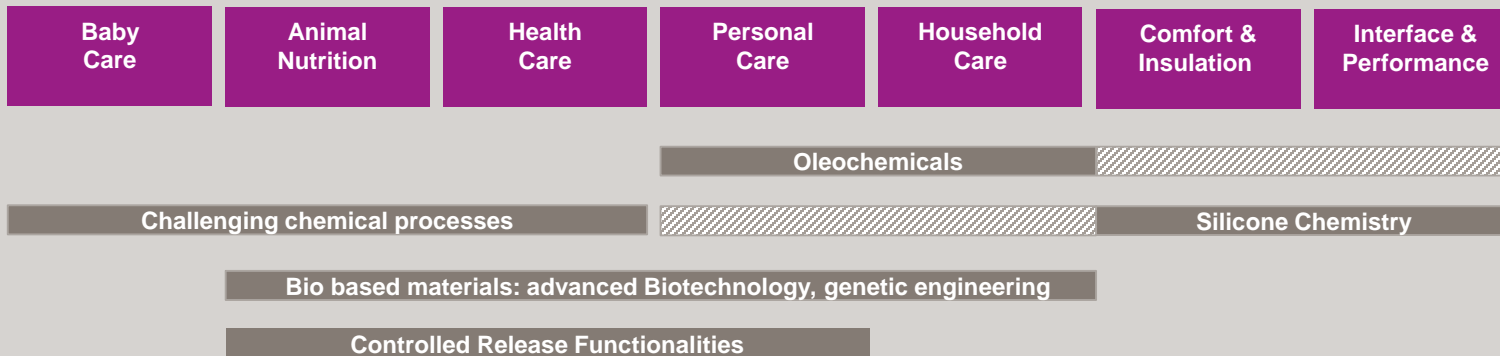
Shared technology platforms to create innovative solutions for our customers



## Nutrition & Care:

- We are the home of **strong technology platforms**
- We create extraordinary solutions from a **huge and diverse skill-set**
- We enable our customers for **differentiating solutions** in their markets

### Examples for enabling technology platforms of Nutrition & Care



# Animal Nutrition: Business at a glance

Preferred partner for sustainable and healthy animal nutrition products and solutions



Top  
#1

Market, technology and innovation leader in amino acids for animal nutrition

Global production setup on

4

continents

>90%

direct sales to customers

>6%

market growth of feed amino acids

~23t

CO<sub>2</sub> emission is avoided for each ton that is consumed in the Methionine production

# Amino acids

## The building blocks of life



**All organisms (human or animal) consist of**

- Water (~60%)
- **Protein (~17%)**
- Fat (~17%)
- Minerals (~5%)
- Carbohydrates (~1%)

### Proteins

- Fulfill vital tasks in the body
- e.g. building up muscles tissue, digesting food, contracting muscles, enabling immune system, etc.

made up from

### 20 amino acids

**8 essential amino acids**  
→ e.g. Methionine, Lysine, Threonine

12 nonessential amino acids

**Have to be ingested as part of a healthy diet**

Produced by the body

# Law of the minimum

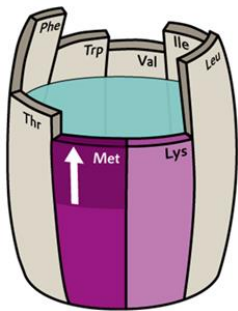
Amino acids help to utilize feed efficiency

## Example poultry nutrition

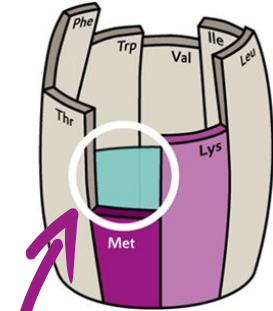
Supplementing  
DL-Methionine



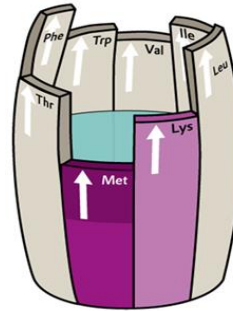
Using only  
conventional feed  
resources  
(e.g. soybeans)



Selective  
= Efficient



The amino acid  
methionine limits  
the growth of  
poultry



Unselective  
= Inefficient



## Law of the minimum

Growth is controlled not by the total amount of resources available, but by the scarcest resource

## Amino acids

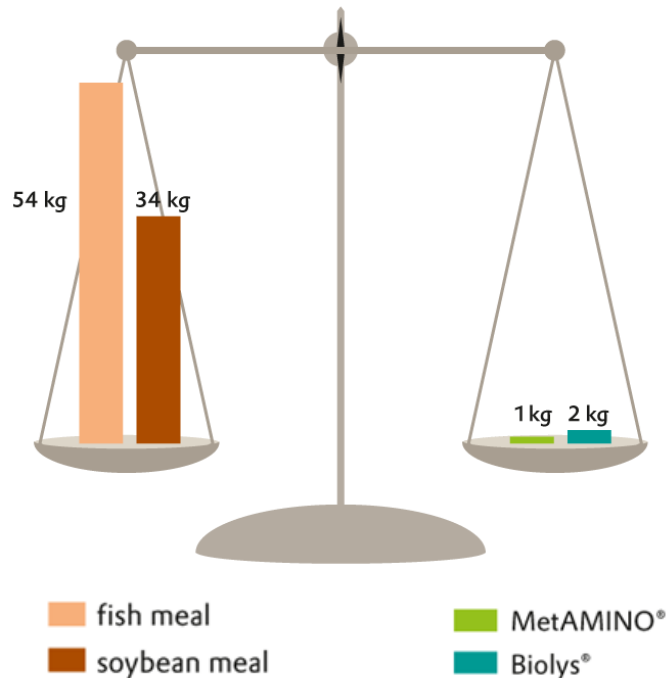
balance animal feed for the ideal composition of amino acids and thereby maximize the utilization by livestock

## Balanced nutrition

- Healthier livestock
- Reduced waste
- Reduced amount of feed needed (cost)

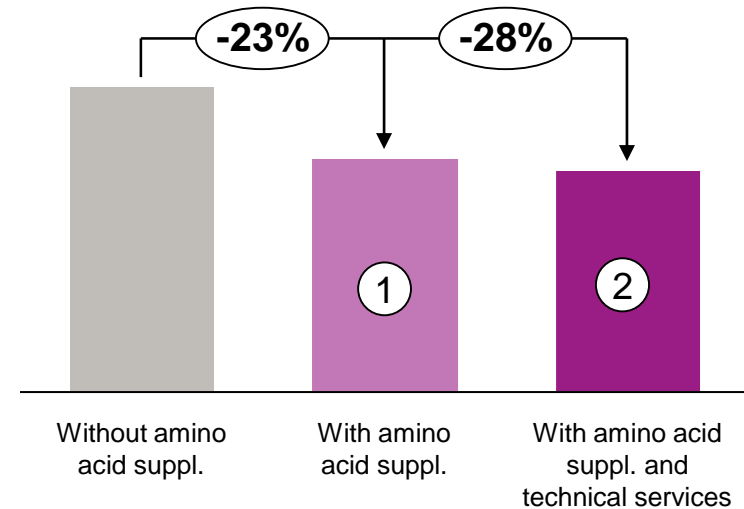
# Amino Acids significantly increase efficiency and improve our customer's P&L

## Significant increase in efficiency



## Significant savings potential

Feed costs to produce poultry meat



- ① Low protein diets with full range of Evonik amino acids
- ② Balanced amino acid and nutrient profiles via Evonik's Animal Nutrition service offering

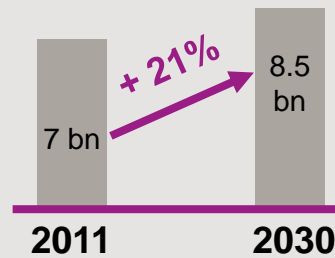
# Socio-demographic megatrends drive growing meat demand

## The Challenge - Meeting the needs of the growing population for healthy and safe food

### World Population

Higher meat consumption:

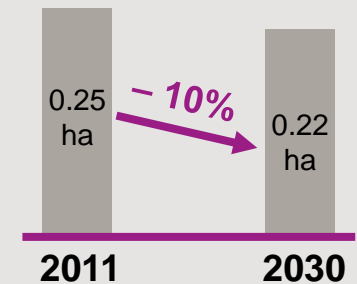
- Increasing population
- Urbanization



### Technology

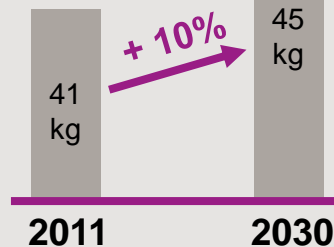
Decreasing land per capita

Technology needs to cope with limited resources



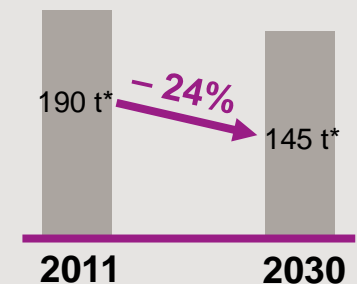
### Standard of living (affluence)

Higher meat consumption per capita



### Sustainability of Food Chain

Stronger focus on reduction of emissions e.g. China

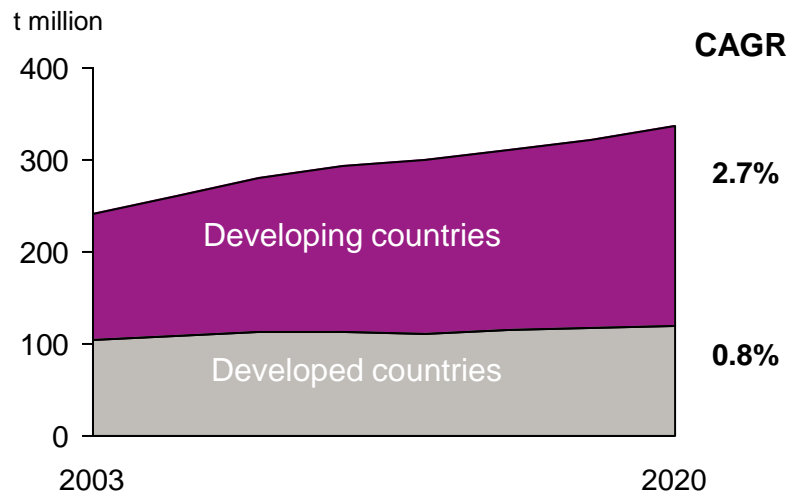


\* Tons CO<sub>2</sub> emission in China per one million RMB GDP



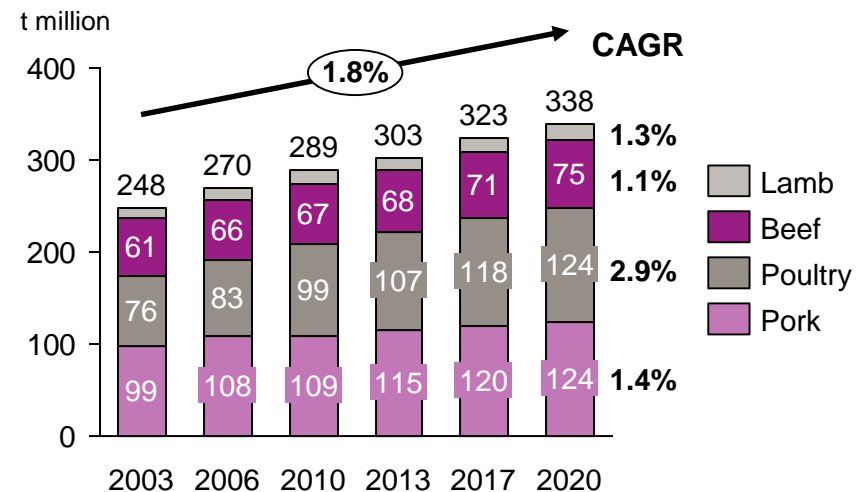
# Improving standard of living in developing countries drives worldwide meat demand

## Meat consumption by region



- Consumption habits and demand level are key drivers for meat market growth
- Global meat markets grow twice as fast as population (0.9% p.a.) due to increasing demand in developing countries

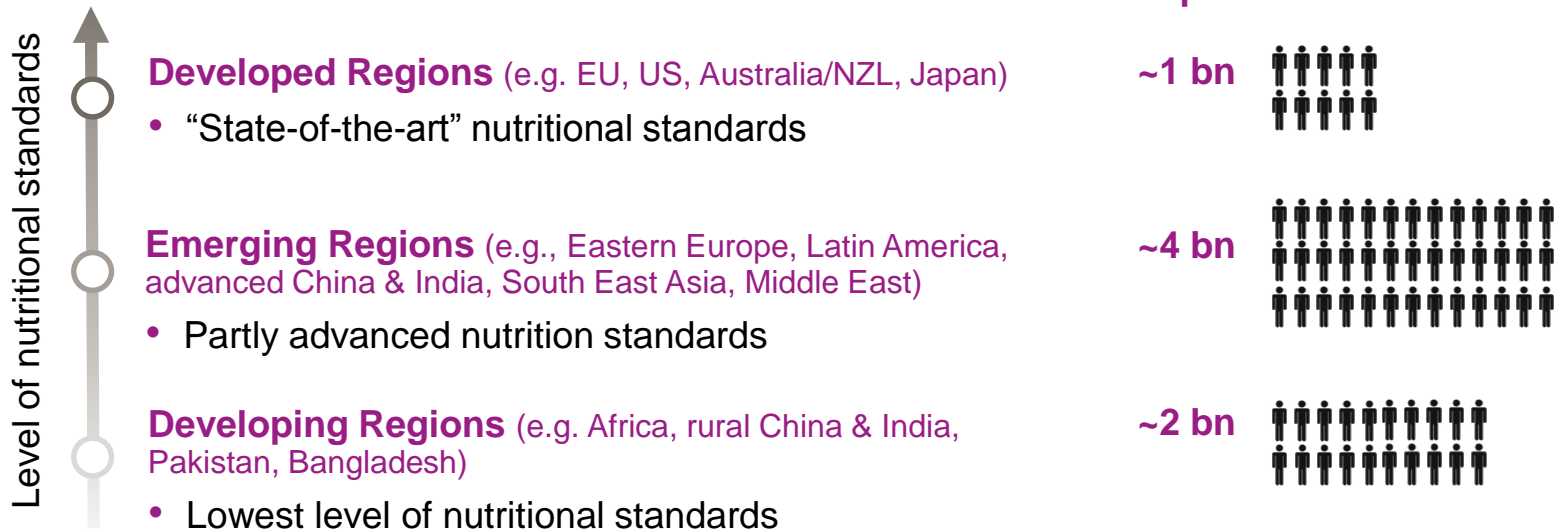
## Global meat market development



- Poultry with highest growth rate due to ease of industrial production, affordability, health image (lean) and unrestricted cultural fit
- Pork still the most preferred meat, especially due to importance in China

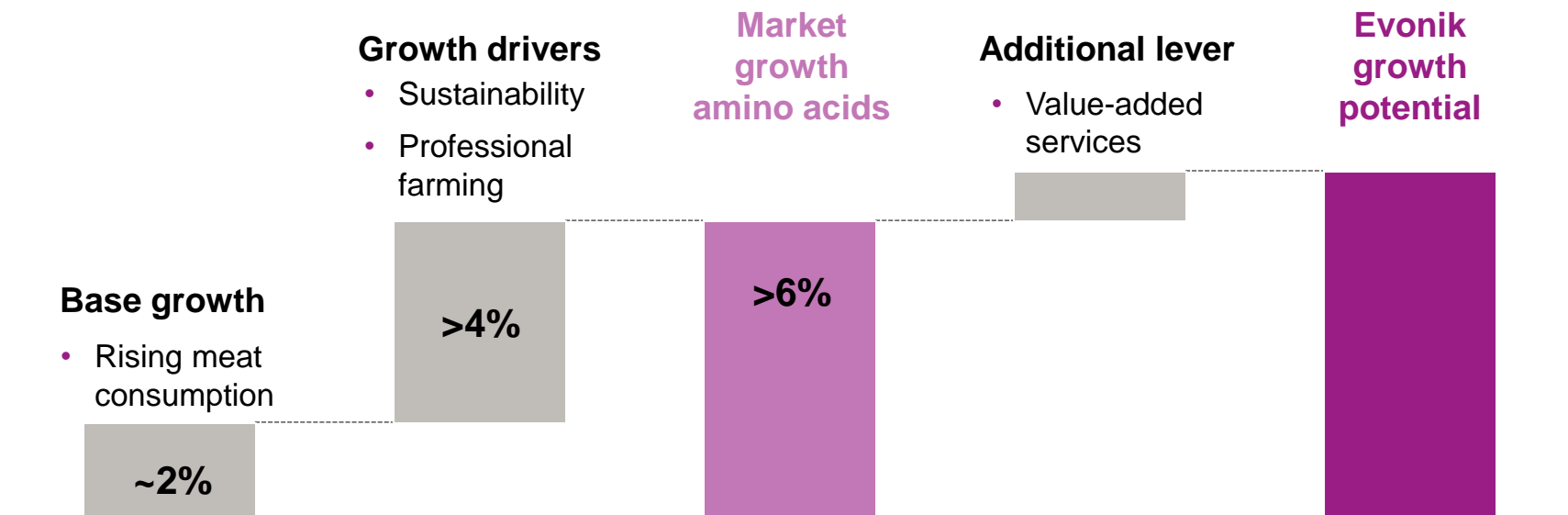
# Globally improving standards in animal nutrition drive growth for high-performance feed

## Nutritional Standards by Region



**Increasing use of advanced nutrition concepts** factored with **growing population** as key growth drivers for feed markets in developing regions

## Components of annual amino acid market growth



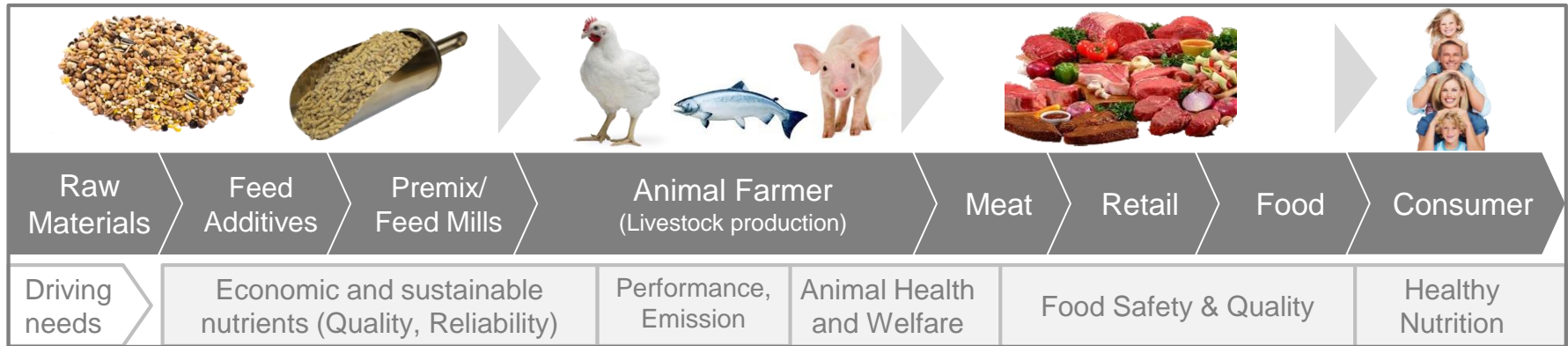
### Evonik growth potential in amino acids significantly outpacing meat consumption due to:

- **Sustainability:** Significant ecological advantages, healthier livestock
- **Professionalization of farming:** Clear efficiency and performance improvements; consolidation trend in agricultural sector
- **Value-added services:** Additional growth driver for Evonik

# Strategic perspective: Expand portfolio to broaden our participation in the food value chain



## Utilizing our technology platforms to grow the amino acid core and expand beyond

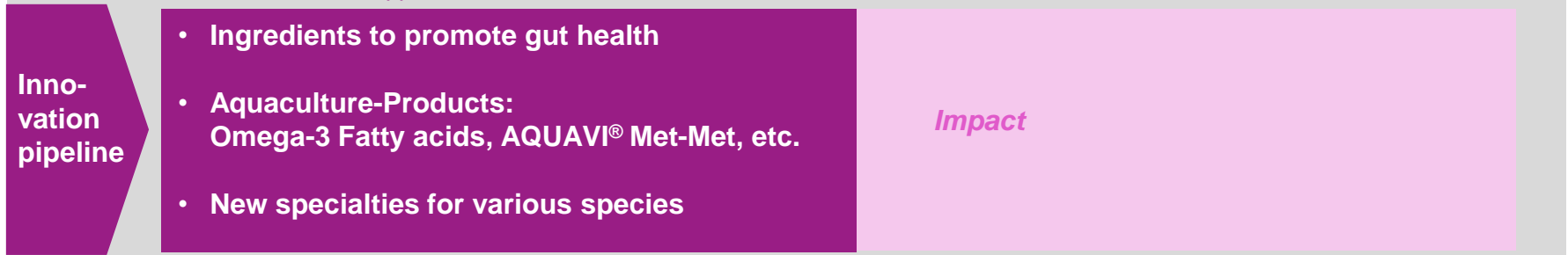


*Customer Access / Application*



## Apply our technology platforms to broaden portfolio in the field of sustainable nutrition

*Customer Access / Application*



# JDA with DSM to develop algae-based omega-3 fatty acids for animal nutrition



- Long-established biotechnology capabilities in development and operations
- Expertise in cultivation of marine organisms

- Focus on industrial amino acid biotechnology
- Expertise in large-volume fermentation

# Announcement focused on four strong core messages



## Joint Development Agreement:

DSM Nutritional Products and Evonik Nutrition & Care GmbH sign a Joint Development Agreement

## Aim:



To meet increasing demand for omega-3 fatty acids by harnessing naturally occurring marine algae, using sustainable, biotechnological processes based on natural, non-marine resources

## Scope:

Algal omega-3 fatty acids for animal nutrition applications, in particular aquaculture and petfood applications

## Why Evonik and DSM?:

**DSM** has expertise in the cultivation of marine organisms and long-established biotechnology capabilities in development and operations while **Evonik's** focus for decades has been on amino acid biotechnology executing large-volume fermentation processes



**Press release**

July 29, 2015

**DSM Nutritional Products Ltd. and Evonik Nutrition & Care GmbH to develop algae-based omega-3 fatty acids for animal nutrition**

DSM Nutritional Products Ltd. (Kaiseraugst, Switzerland) and Evonik Nutrition & Care GmbH (Essen, Germany) today announced they have entered into a joint development agreement for algae-based omega-3 fatty acid products for animal nutrition, in particular in aquaculture and pet food applications. The aim is to meet the increasing demand for omega-3 fatty acids by harnessing naturally occurring marine algae using sustainable, biotechnological processes based on natural, non-marine resources.

Under the agreement, the companies will jointly work on the development of products and explore opportunities for commercialization. The competencies that DSM and Evonik bring to the development partnership complement each other: DSM has expertise in the cultivation of marine organisms and long-established biotechnology capabilities in development and operations, whilst Evonik's focus for decades has been on industrial amino acid biotechnology executing large-volume fermentation processes.

The envisioned algae-based omega-3 fatty acid products will be high value, natural and sustainable alternatives to fish oil, whose supply is finite. This will help the animal nutrition industry keep up with increasing demand without endangering fish stocks and will contribute to healthy and sustainable animal nutrition. Just like humans, animals also need their daily intake of essential, long-chain polyunsaturated fatty acids in their diet to ensure healthy growth. Until now, these fatty acids have been added to aquaculture feed almost exclusively from marine sources such as fish oil and fishmeal. By using algae, DSM and Evonik are looking to contribute to a more sustainable aquaculture industry.

**Press contact**  
Evonik Nutrition & Care GmbH  
Dr. Jürgen Krüger  
Phone +49 61 81 59-6247  
juergen.krueger@evonik.com

**Press contact**  
DSM Nutritional Products  
Herman Batten  
Phone +31 45 9762017  
herman.batten@dsm.com

Evonik Nutrition & Care GmbH  
Rellinghauser Straße 1-11  
45128 Essen  
Telephone +49 201 177-01  
Telefax +49 201 177-8475  
Germany  
www.evonik.com

**Management Board**  
Dr. Rainer Bock, Chairman  
Dr. Hans-Joachim Ritzert  
Stefan Michael Gattermann  
Manus Schäfer

Registered office Essen  
Registered court  
Essen local court  
Commercial registry B 25784  
HR no. FN 481887 v

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# Status and Progress of Joint Development Agreement



- Project is running at full speed.
- Evonik and DSM aim to contribute to filling the **future supply/ demand gap for high value omega-3 fatty acids**, which cannot be filled by fish oil.
- Evonik and DSM aim to set a **new industry standard** for omega-3 fatty acids based on performance, uniqueness, quality and reliability.
- Market development approach **along the entire value chain** from Feed Producers through Retailers





**Growth  
Agenda**

The diagram features a central purple circle labeled 'Growth Agenda'. Three lines radiate from the right side of the circle to three separate text boxes. The top box is connected by a line that goes up and then right. The middle box is connected by a line that goes down and then right. The bottom box is connected by a line that goes down and then right. Each text box contains a bolded heading and a sub-point.

**Leveraging our strength of the amino acid core**

**Drive Differentiation – Adding value to customer, markets and Evonik**

**Leveraging leading technology platforms  
– Expand further into solutions for  
“Sustainable Nutrition”**



# Following presentations



Field Trip Animal Nutrition		
12.45 – 13.30	<b>Leveraging the sustainable food chain as growth driver</b> <i>Q&amp;A session</i>	<b>Dr. Christoph Kobler</b> Vice President Global Account Management & Sales Strategy Animal Nutrition
13.30 – 14.15	<i>Quick lunch</i>	
14.15 – 15.00	<b>Building strong customer relations through value propositions</b> <i>Q&amp;A session</i>	<b>Dr. Alfred Petri</b> Senior Vice President Sales & Marketing Services Animal Nutrition
15.00 – 15.45	<b>The MetAMINO® success story</b> <i>Q&amp;A session</i>	<b>Dr. Emmanuel Auer</b> Head of Animal Nutrition Business Line
15.45 – 17.00	<b>Plant Tour</b>	<b>Dr. Hartwig Pohlmann</b> Head of Global Production and Technology Animal Nutrition
		<b>Frank Daman</b> General Manager Evonik Antwerp Site



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