

Animal Nutrition & Health

Factbook for Investors
April 2022

HEALTH · NUTRITION · BIOSCIENCE



Healthy animals, people & planet

Creating feed solutions that contribute to high-quality food, while looking after the welfare of the animals and the planet

- DSM Animal Nutrition & Health offers science-based nutrition solutions, based on a broad portfolio of ingredients including vitamins, enzymes, eubiotics, carotenoids, lipids, minerals and other specialties:
 - Nutrition solutions increase feed efficiency, which helps satisfy growing global demand for healthy and sustainable protein, brought upon by population growth and rising standards of living
 - Nutrition solutions also improve animal health & wellness, incl. gut health and reduce the environmental impact of farming as fewer resources are needed to produce the same amount of animal protein
- DSM is **unique with the business model of “Global Products and Local Solutions”**. We have the most complete portfolio of ingredients, a global network and are integrated along the value chain in premixes and solutions
- We drive our business through the Business Lines Essential Products (i.e., Vitamins, Carotenoids), Performance Solutions (i.e., Enzymes, Eubiotics, Mycotoxin Solutions) and Precision Services (i.e., farm management and sustainability solutions)
- Dedicated Competence Centers for Feed Efficiency, Gut Health, Mycotoxin Risk Management and Specialty Nutrients are developing state-of-the-art technologies, products and solution across all Species

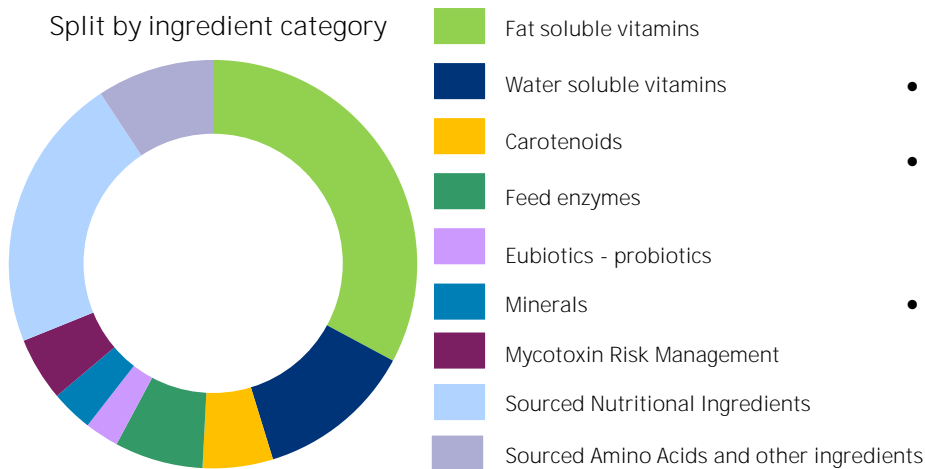
Global population growth & need for more sustainable animal farming drive sales growth

Sales
€3.3bn



DSM offering broad range of ingredients ...

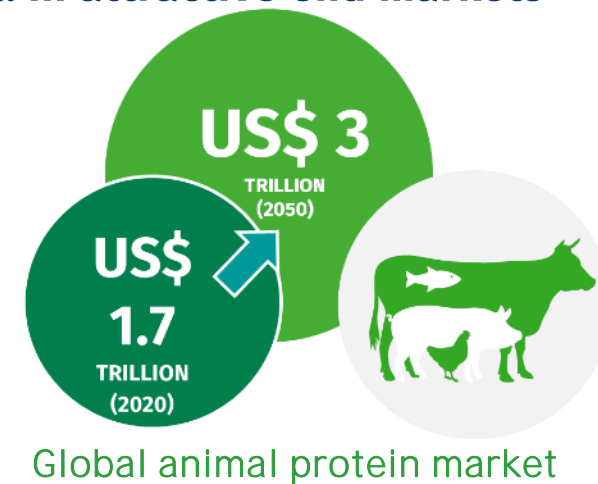
Split by ingredient category



... holding a strong market position ...

- ~30% market share in our markets
- Unique global premix network, strong representation in all regions in the world
- 65% of sales as premix solutions

... in attractive end markets

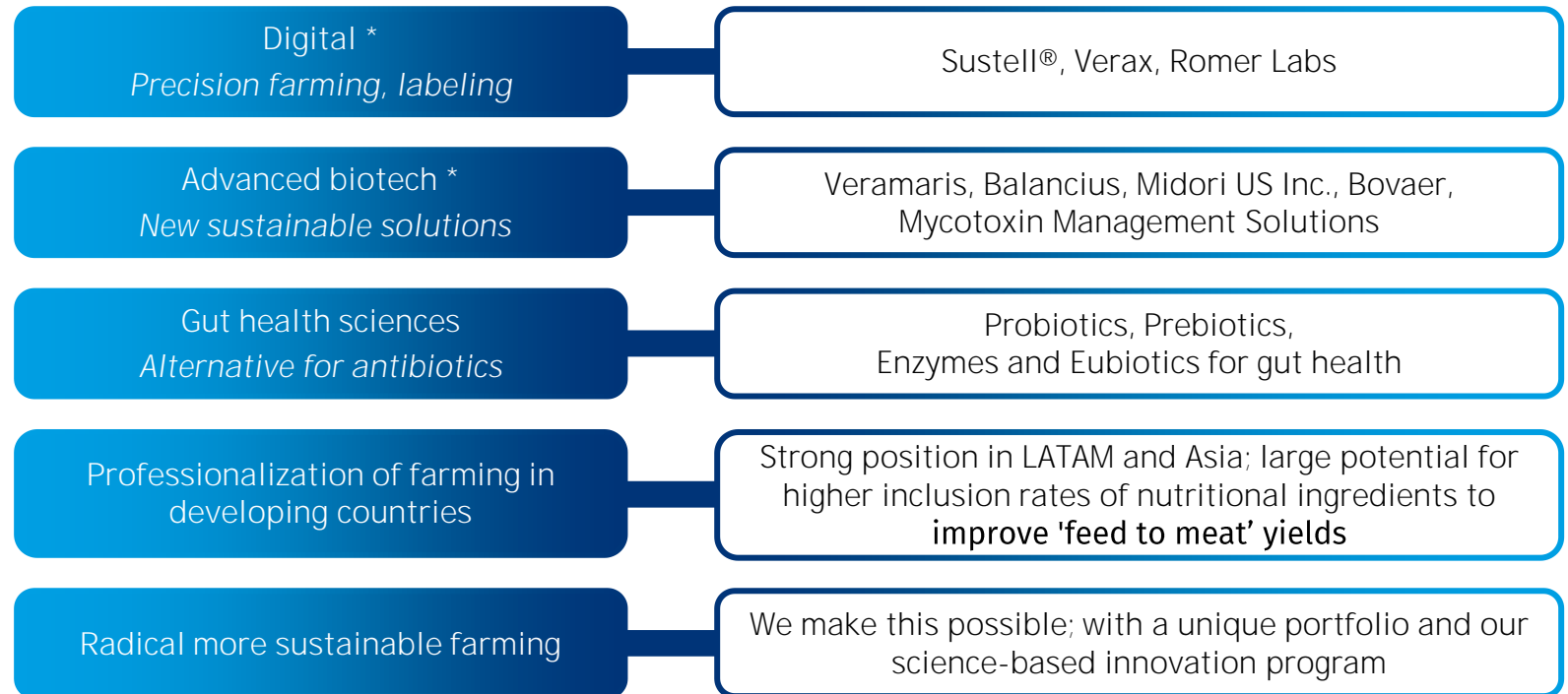


Productivity & sustainability drive demand for nutrition solutions

Key trends



Offering new opportunities ...

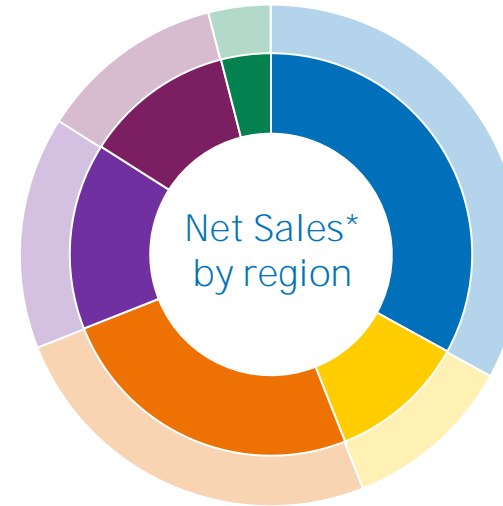


... for which DSM is uniquely positioned

Most complete ingredients portfolio, combined through a “Global Products, Local Solutions” approach enriched with Precision Services



ANH has a well-balanced global presence with more than 55 premix and blending facilities



- Europe (33%)
- North America (11%)
- Latin America (25%)
- China (15%)
- Rest of Asia (12%)
- Rest of the world (4%)

Complete portfolio of ingredients and solutions for animal feed

ESSENTIAL PRODUCTS

1

Vitamins

Vitamins are essential for well-being and good health. They play many crucial roles in farm animals such as bone formation, disease resistance, feed efficiency, growth, fertility, and egg production. **DSM's portfolio** includes all vitamins from A to Z



1

Colorants Carotenoids

Carotenoids are essential ingredients that are important in nutrition and reproduction. Providing sufficient carotenoids increases animal performance across species. Carotenoids also ensure consistent pigmentation of eggs and fish such as salmon. Key carotenoids are beta carotene, lutein, canthaxanthin, astaxanthin and zeaxanthin



3

Minerals

Minerals are needed in very small amounts in feed. Animals need certain minerals for instance to build strong bones and turn the feed into energy. As with vitamins, a healthy balanced diet should provide all the minerals needed to work properly



PERFORMANCE SOLUTIONS

1

Feed Efficiency (Enzymes)

Enzymes help unlock nutrient potential in feed driving feed cost optimization while at the same time improved ecological footprint of animal protein production. They allow a more efficient use of natural resources and increase animal welfare



2

Gut Health (Eubiotics)

Eubiotics are innovative feed additives that play an essential role in supporting animal performance and animal welfare by supporting gut health. Good gut health is a prerequisite for efficient and environmentally sound farm animals in modern farm systems. The correct balance of microflora in the intestinal tract (known as eubiosis) is essential for optimal gut performance



1

Mycotoxin Risk Management

Mycotoxins are secondary metabolites of molds, contaminating a wide range of crop plants and fruits. Such contaminated crops are toxic to humans and animals. Consequently, reliable and efficient mycotoxin testing solutions are paramount. With over 35 years of experience in this field, Romer Labs offers the most comprehensive portfolio of mycotoxin testing solutions.



1

2

3

Global Market position DSM

ANH capabilities range from formulations to premix solutions and precision to drive sustainable animal farming

Formulations

- A broad range of technologies transform 85% of our Nutritional ingredients into formulations, for example a fat-soluble vitamin oil into a powder form
- This increases performance in terms of stability, shelf-life, heat resistance, bio-availability, physical properties



Spray dried



Multi-layer
Micro encapsulate



Flake

Premix Solutions

- DSM offers its clients regional and segment-specific premix solutions: a broad network of more than 55 premix facilities allows DSM to offer tailor-made, localized customer-driven solutions
- 65% of total sales from Animal Nutrition and Health are through premix solutions



Precision

- DSM offers an intelligent sustainability service that combines the most advanced environmental foot printing calculation tool with expert sustainability, animal production and nutritional knowledge to create tailor-made, practical solutions and business development projects that enhance the environmental sustainability and profitability of animal farming.



Global Market position DSM

ANH Operating Model: “Global Products” and “Local Solutions”

complement each other with distinct approaches

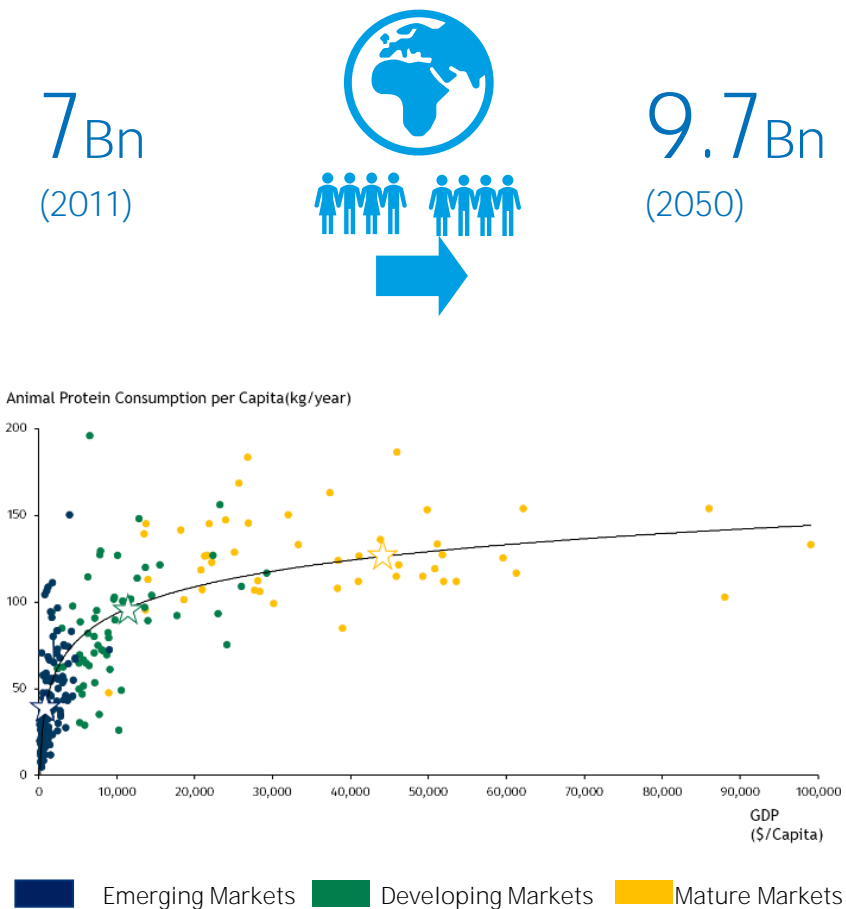


35% of DSM's sales are sold as single nutritional ingredients, while 65% of these nutritional ingredients are bundled in a premix and blends

Despite alternative protein growth trend, animal-based protein will continue to grow at 1-2% driven by population and GDP-growth

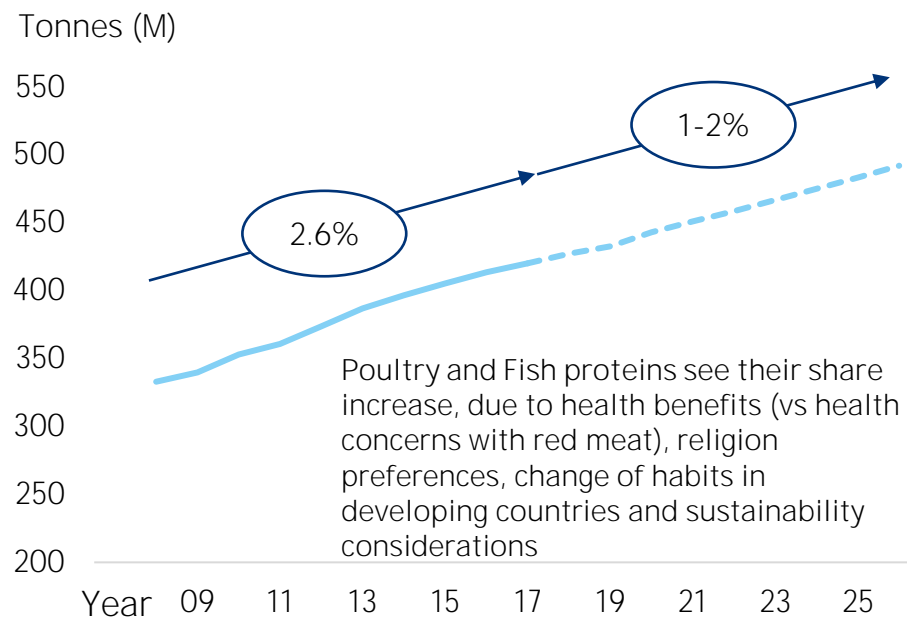
World population growth

Animal protein consumption strongly linked to per capita income



Sustained growth of animal protein production

Meat & fish production (beef, swine, poultry, aquaculture)



10 Source: United Nations, World Bank, IMF, FAO - Food & Agriculture Organization of UN, OECD



Feed Additives market growing at higher rate of 4-5% driven by increasing inclusion rates and innovation in compound feed

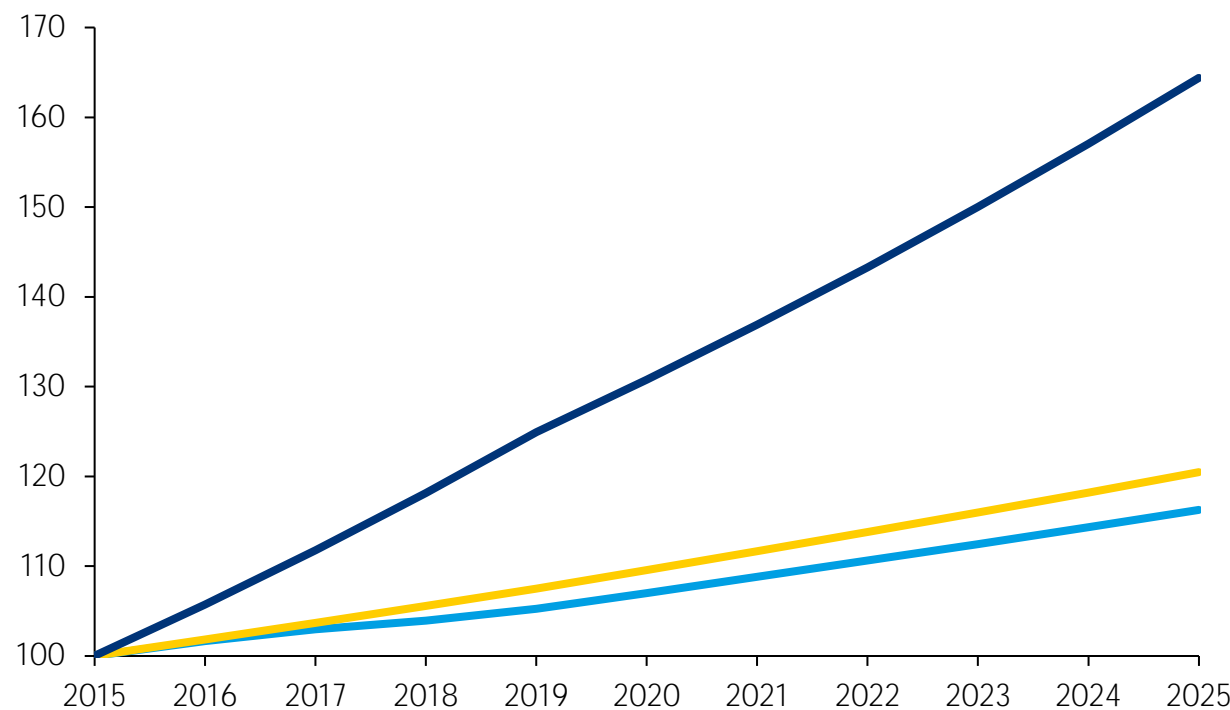
Feed Additive vs. Compound Feed and Meat Consumption Growth

Growing feed additive inclusion driven by:

- Larger & more professional farming practices
- Pressure on productivity & feed conversion
- Abolition of antibiotic growth promoters
- Entry emission control additives

Index (Base 100 = 2015)

— Feed additives — Compound Feed — Meat consumption



'15-'19 CAGR '19-'25 CAGR

5.7% 4-6%

1.8% 2%

1.3% 1-2%



We have the ambition to continuously outperform the market

Animal protein Market Growth



2-3%

Poultry



0-1%

Ruminants



1-2%

Swine



4-5%

Aqua

Strongest growth in more sustainable poultry, egg and aqua

Population growth and income growth in developing world support demand

2022-2025 growth: roughly 2% per year on average

Feed additives market growth

Need for more sustainable farming and higher yields drive higher inclusion rates and thus above market growth

Reduction of emissions – methane, CO2, nitrogen, ammonia, phosphorous

Protection of biodiversity, deforestation, protection of ecosystem (land and ocean)

Reduction of food loss and waste

Reduction of use of anti-biotics

2022-2025 growth: roughly 3-4% per year on average

DSM's ANH growth

DSM leveraging its unique business model in global products, local solutions, including a global premix network and regional R&D facilities, extended with precision farming

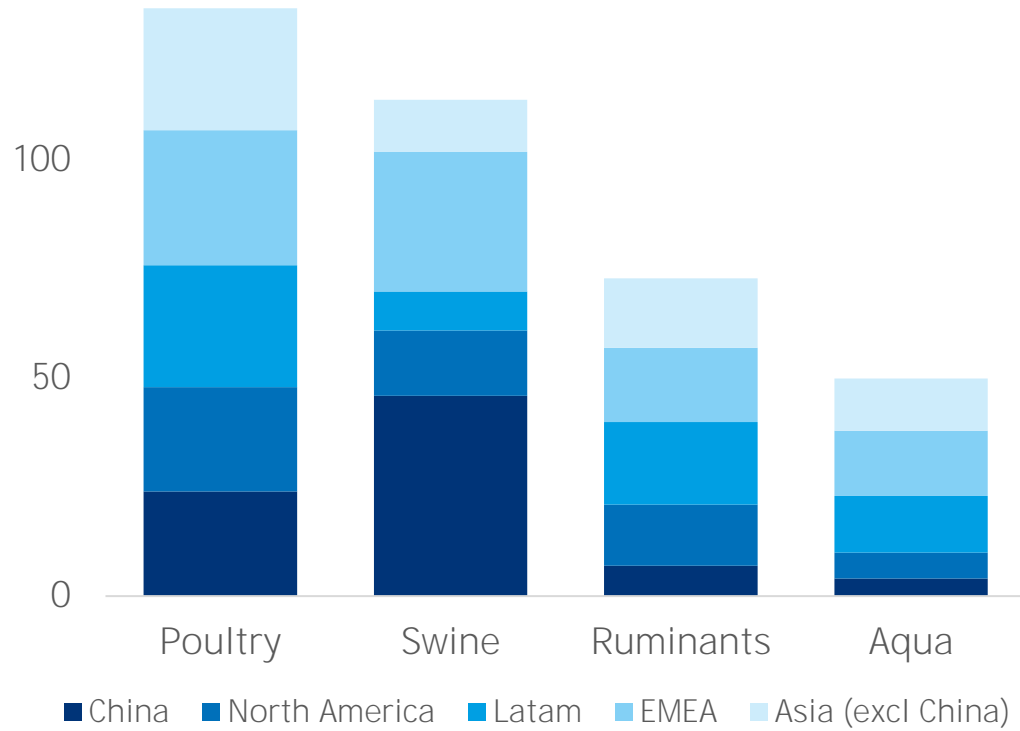
Higher growth of specialty Performance Solutions including Hy-D®, Myctotoxins, VevoVital®, Digestarom®

Rich innovation pipeline addressing challenges including Sustell™, Veramaris®, Bovaer®, HiPhorius™, Protease ProAct360™

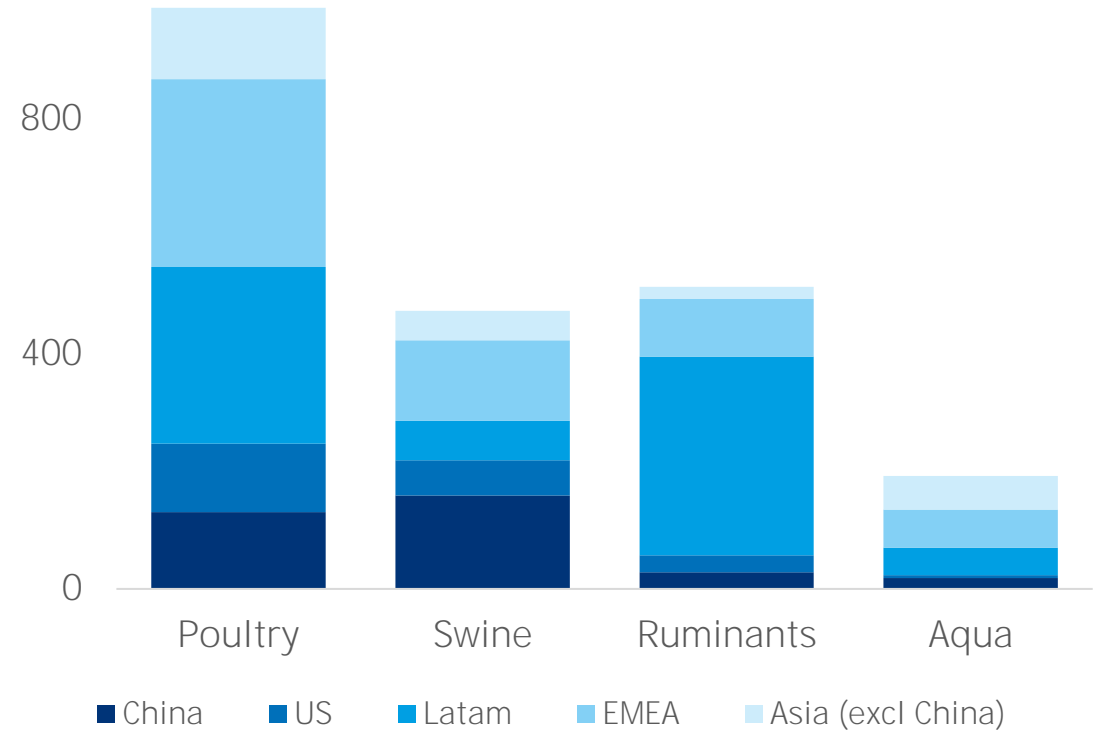
2022-2025 growth: roughly mid single digit on average

A strong basis across all Species and Geographies enables success

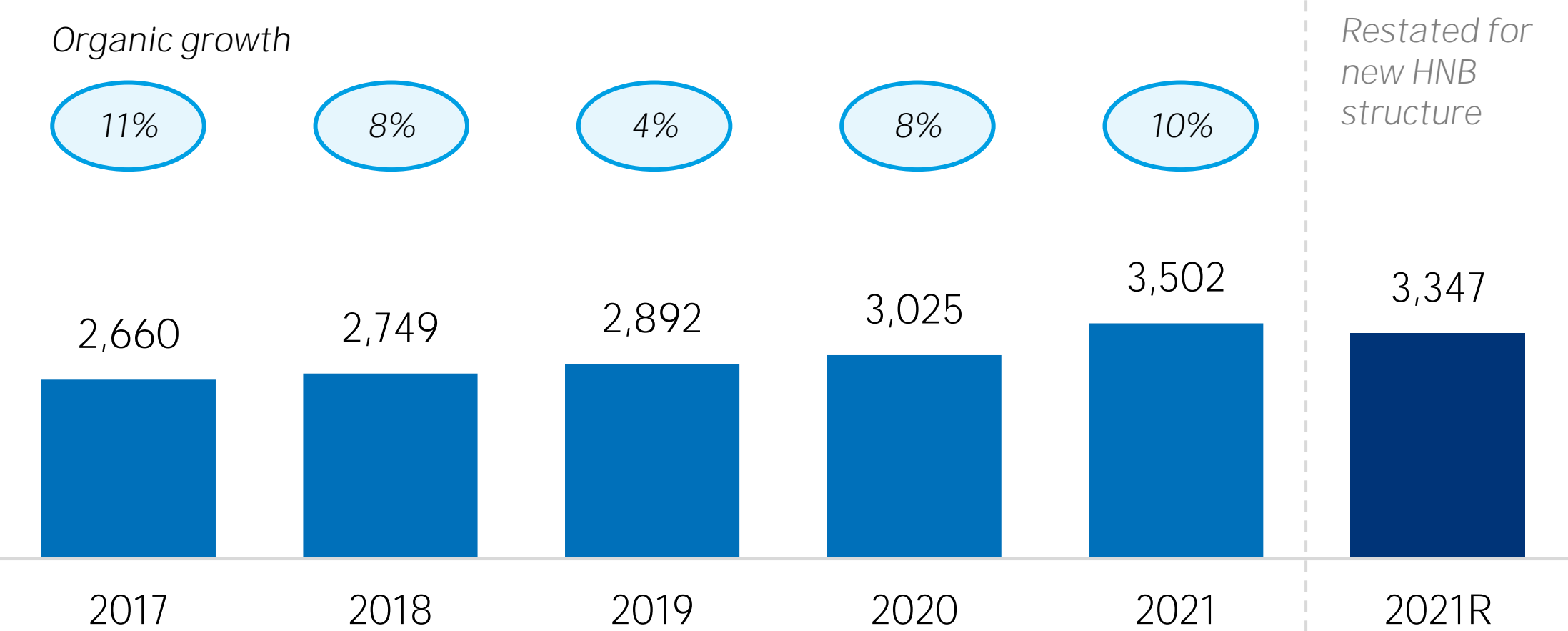
Global Animal Protein Production 2021
(million of tonnes)



DSM ANH Sales
(€m)



ANH has a record already of strong above-market organic growth

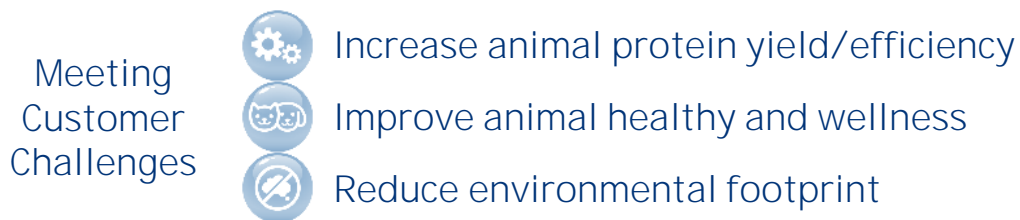


*2018 sales of the underlying business corrected for DSM's best estimate of the 2018 temporary vitamin effect due to exceptional supply disruptions in the industry in the first nine months of 2018



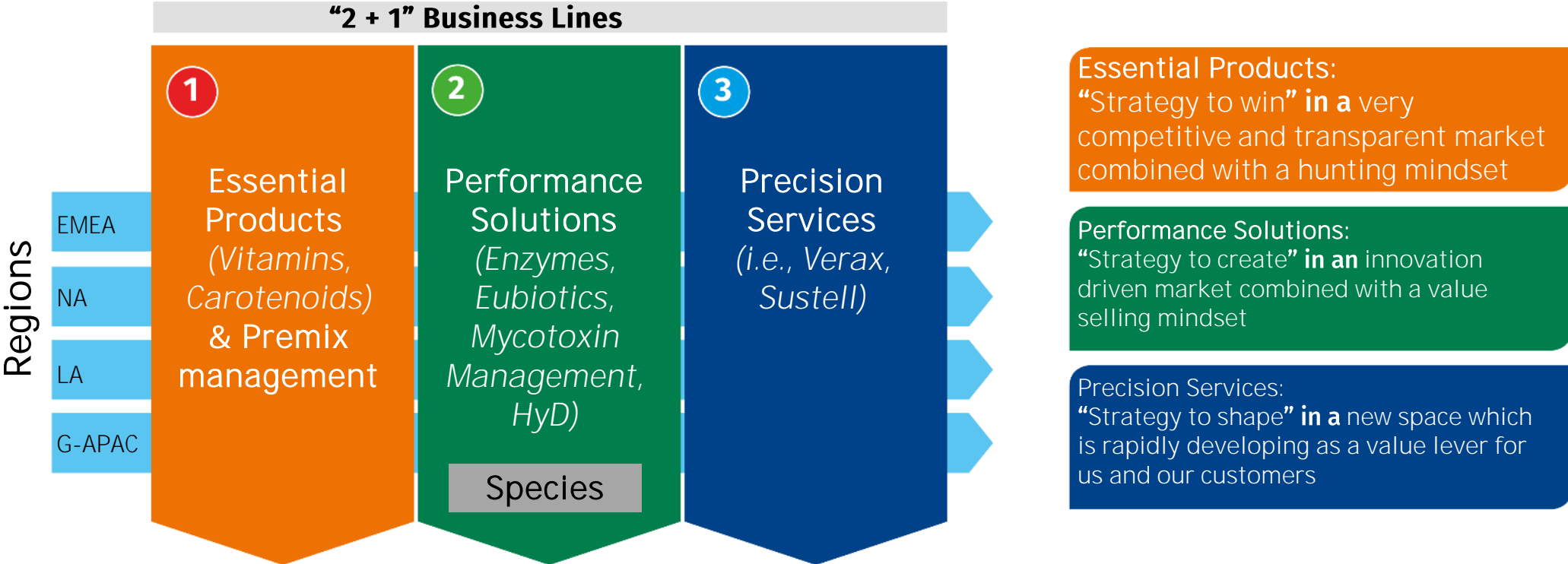
ANH strategy: Focused on stepping up animal farming in productivity and sustainability

- Foster market leadership in Essential Products by differentiating in quality, reliability and innovation
- Solidify our position as the leader in creating and delivering Performance Solutions
- Establishing Precision Services to provide transparency and traceability of livestock production and food safety, enabling a data-driven dialogue and information flow towards the consumer
- Building on 55 world class Premix and Blending facilities across the world to align our solutions with local customer needs
- Deliver on our Innovation pipeline by anticipating customer needs and having a disciplined execution to shape the industry



Target mid single digit organic sales CAGR

Three Business Lines with distinct strategies, complementing each other



Our ANH strategy is fully synchronized with the SDGs

Support affordable, accessible, aspirational **healthy nutrition** for a growing global population

Fight **hunger and malnutrition** worldwide

Provide for healthy diets and **combat diet-related diseases**

Support good health and **immunity** through via diets and supplementation

Reduce the risk of **anti-microbial resistance**



Reduce emissions from livestock: greenhouse gas (CO₂, methane), nitrogen/ammonia, phosphorous

Limit impact on natural resources, reduce pressure on biodiversity, conserve forests & oceans

Drive sustainable proteins from farming whilst **improving animal health & welfare**

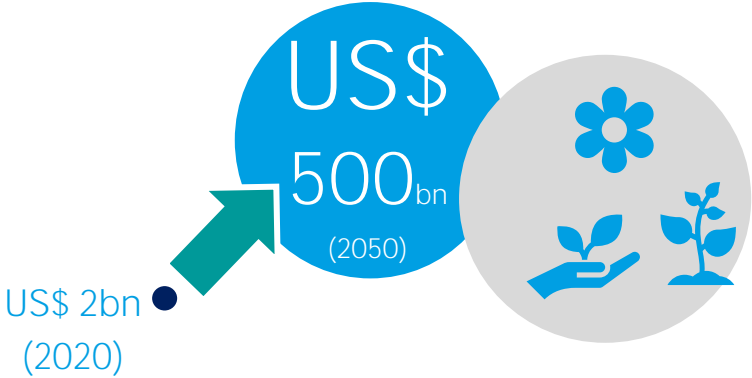
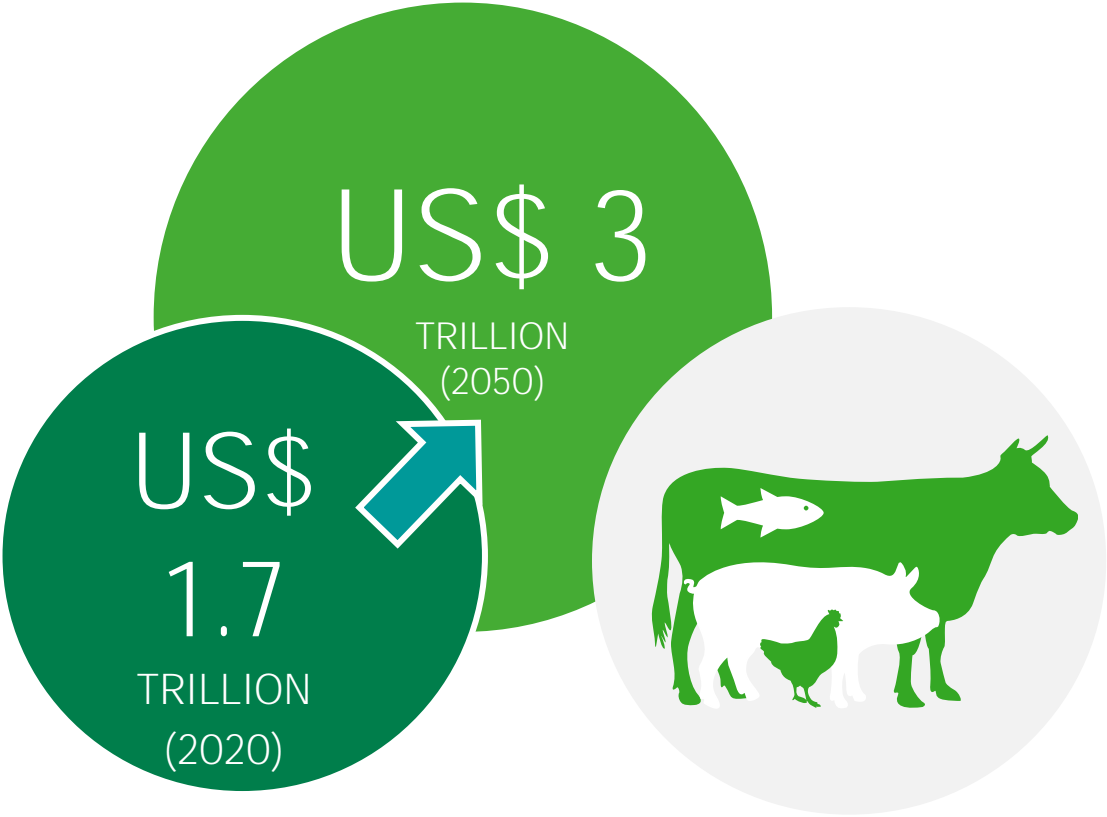
Develop and enable **alternatives for animal proteins**, that are nutritious, tasty and sustainably produced

Support farmers to generate a fair and stable income with sustainable farming practices

Promote a healthy supply chain for food and feed production that provide **welfare for the local communities** in which they operate

Promote **education, equality, equity, human rights**

A growing, more affluent population offers significant upside in demand for proteins, both for animal and alternative proteins



Animal farming has a critical role to play in society to shape a better world

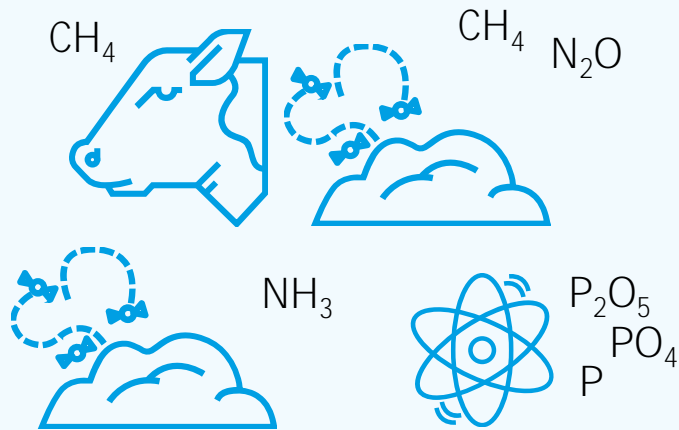
- Efficient and affordable way to produce healthy proteins
- Use marginal lands to produce digestible protein
- Plays a key role in nutrient cycling and soil fertility
- Key socio-economic factor – lifting people out of poverty in developing regions (employment)
- 30% of world population is involved in agricultural activities
- Yet, 820 million people are still exposed to chronic hunger and undernourishment (FAO, 2020)



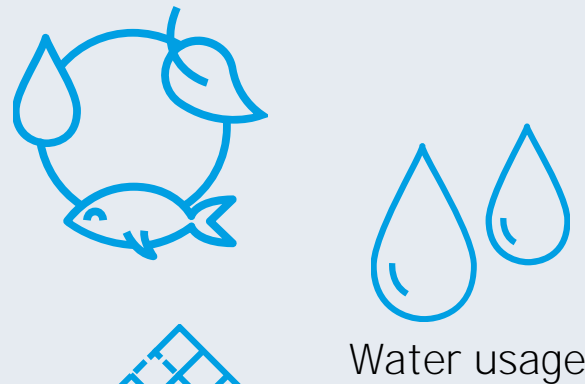
BUT: Animal Farming MUST become more sustainable

Reduction of emissions

Green House Gasses (e.g. methane), nitrogen, ammonia, phosphorus



Protection biodiversity and ecosystem on land and in the ocean



Land use - deforestation

Improving quality & safety meat, fish, milk and eggs while reducing food loss & waste



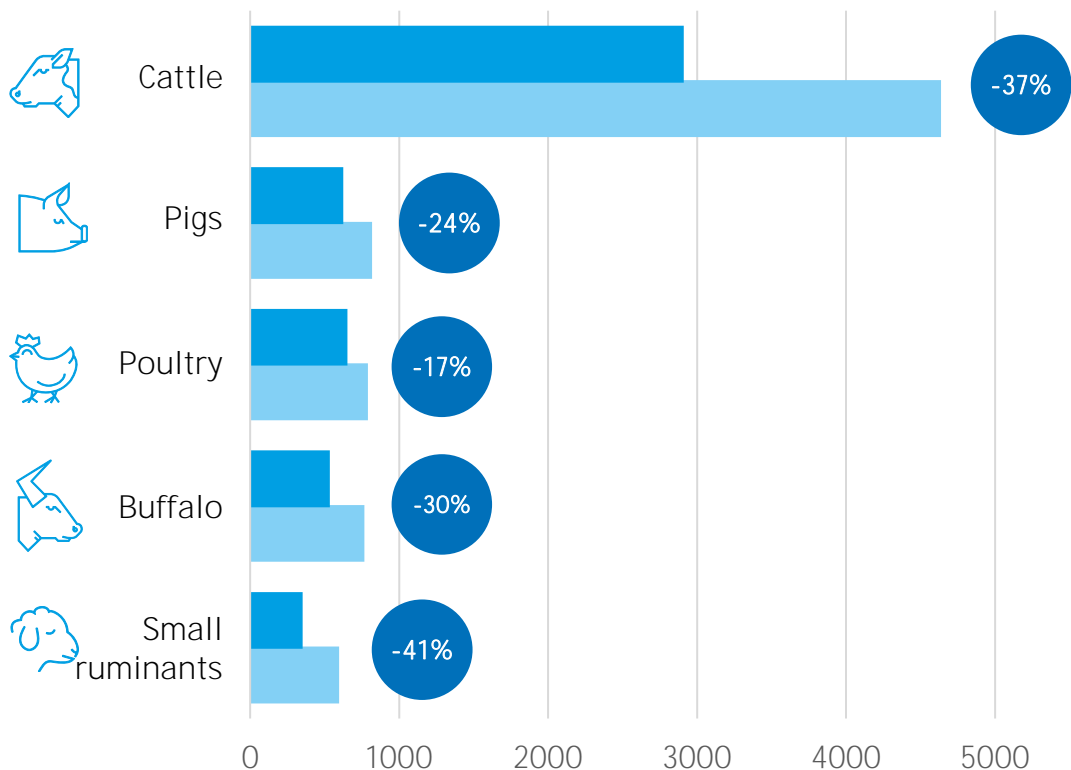
Food loss & waste



Tackle anti-biotic resistance

Animal proteins CAN become more sustainable and significant emissions reductions are possible ...

... if best practices and technologies are implemented across species



This can be achieved through the following:

Productivity gains
especially milk & meat production and reducing food loss & waste

Improved nutrient utilization
including the consequential reduction in manure nitrogen & its reactive forms

Enteric methane inhibition
imperative for fast and effective GHG reduction

Feed additives and nutritional science are the foundation to making improvements and unlocking the value of sustainability

Reductions based on applying practices of the 10th percentile of producers with the lowest emissions while maintaining constant output. Million tonnes CO2-EQ



ANH Innovation: Focused on 6 Business Drivers, connected to key SDGs and central for animal production sustainability



Helping tackle antimicrobial resistance



Reducing our reliance on marine resources



Making efficient use of natural resources



Reducing emissions from livestock



Improving lifetime performance of farm animals



Improving the quality of meat, milk, fish and eggs while reducing food loss & waste

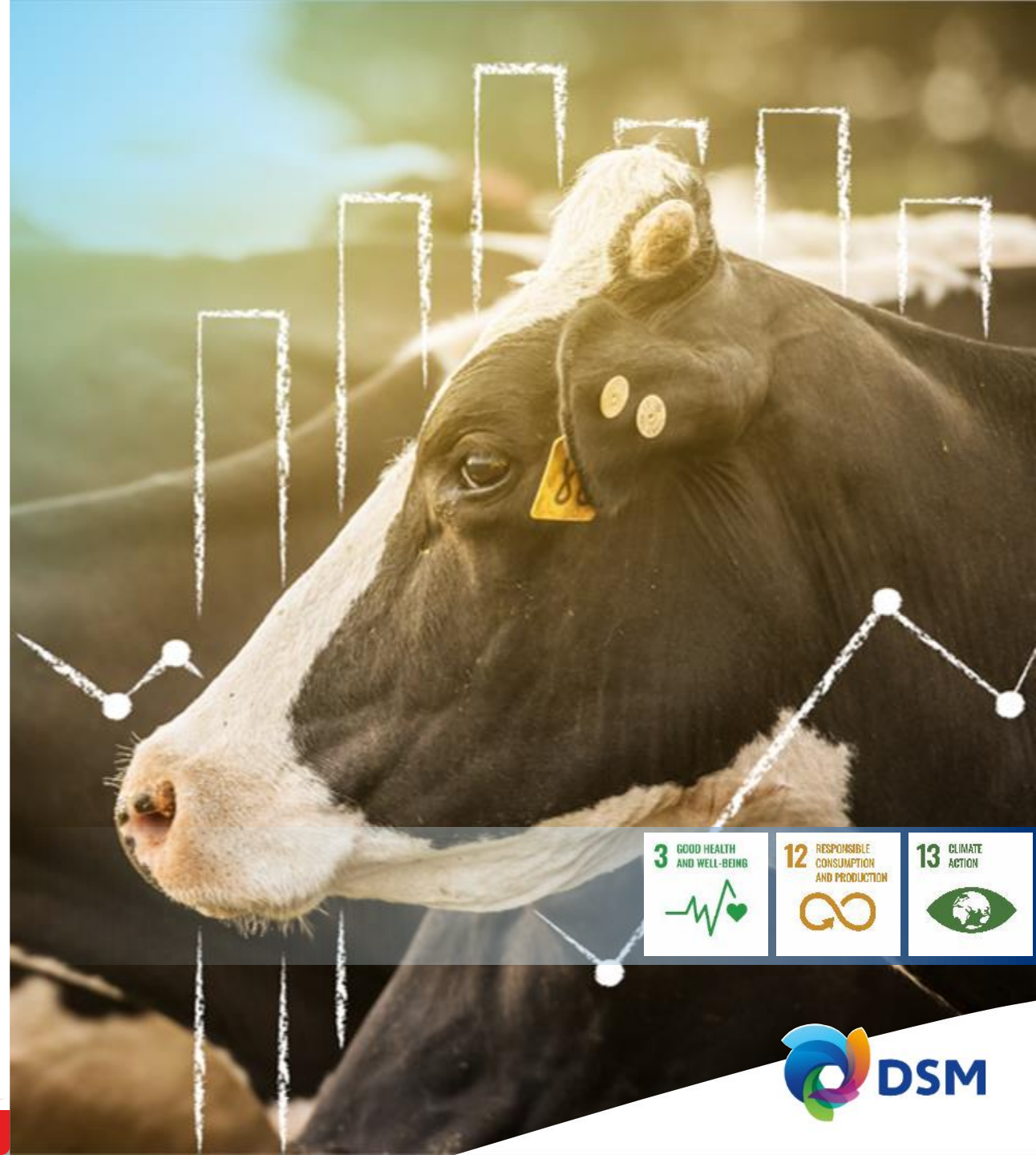
SUSTAINABLE DEVELOPMENT GOALS



Bovaer™

Reducing emissions from livestock

- Update Q1 Around 14.5% of all human-caused greenhouse gas (GHG) emissions come from livestock, with nearly 65% of this originating from dairy and beef cattle
- Bovaer™ is a cutting-edge technology that directly reduces the enteric methane emissions by approximately 30% for dairy and beef cattle as well as sheep – no other player with a similar effectiveness
- 2022:
 - Bovaer approved for dairy cows in Europe
 - Bovaer approved for beef and dairy cows in Brazil and Chile
 - Capacities arranged for up to Euro 100m sales by 2025
 - Several market development cooperations in place with dairy companies in Europe and New Zealand and for beef with JBS in Brazil
 - Large production plant under development in Dalry, UK for start-up in 2025
 - Ramp-up of sales to several hundreds millions of Euros from 2025



Veramaris®

Reducing our reliance on marine resources

- Algae-based technology producing omega-3 fatty acids EPA and DHA that are critical for aquaculture feed – sole player in the industry
- Reducing the need for omega-3 EPA and DHA derived from wild caught fish, a finite marine resource
- Combatting overfishing while enabling the aquaculture industry to grow sustainably and become a net fish producer
- Addressing the decline in omega-3 levels in salmon
- Veramaris® can produce the equivalent amount of omega-3 EPA and DHA to that obtained from 1.2m tons of wild catch fish – more than the annual catch of the Mediterranean Sea



Balancius™

Helping tackle antimicrobial resistance

- Unique, break-through feed ingredient (“**gut health enzyme**”) that significantly improves broiler productivity and reduces FCR by 3% consistently, replacing the use of antibiotic growth promoters
- Gut Health Enzymes established as new enzyme class facilitating digestion and nutrient absorption, developed by DSM and Novozymes (“**Enzymes Alliance**”)
- Optimizes nutritional absorption and digestion, so broilers get more from their feed, trials show that adding Balancius of a broiler flock of 1 million birds saves 12,500 kgs of feed
- If used by the LatinAmerica chicken flock, the reduced feed requirement would amount to an annual GHG emissions reduction equivalent to that of a population of half a million people



Hy-D®: Reducing food waste

Billions of eggs can be saved each year

- Global food distribution coupled with the loss and waste of more than 1 billion tons of food each year, resulting in about 24% of food calories produced never being eaten
- **DSM's Hy-D**, allows a more effective mineral metabolism, leading to a 4% increase in eggshell thickness and a 15% reduction in egg breakages
- **Supports the animal's health and welfare** leading to improved productivity and lifetime performance



VevoVital[®] eubiotics

Tackling antibiotics, reducing nitrogen emissions

- Nitrogen and phosphorus emissions from animal production are very important to address since they are key drivers of land and water eutrophication and biodiversity loss
- VevoVital[®] improves feed efficiency and significantly lowers ammonia (nitrogen) emissions from swine operations by up to 20%
- VevoVital[®] optimizes gastrointestinal functionality and health of livestock animals crucially, enabling the removal of antibiotics for growth promotion (AMR)
- Highest effectiveness and quality due to an ultra pure version of benzoic acid
- Enabling farmers to use less feed, which leads to more sustainable farming



Protease ProAct® enzyme

Making efficient use of natural resources

- Growth in animal production places tremendous demands on the world's natural resources
- DSM's ambition:
 - Limit the use of finite natural resources
 - Reduce pressure of crop production on biodiversity
- Protease Proact® feed enzyme:
 - Improves feed digestibility
 - Increases the amount of digestible protein in feed
 - Allows more diverse use of various local feed raw materials
 - Decreases pressure on land-use and deforestation
 - Decrease in nitrogen content in manure
- Used globally in broilers, ProAct® would allow replacement of 7 million tons of soybean meal (9m tons of soy), leading to a lower deforestation pressure of 3 million ha per year (the size of Belgium)



Mycotoxin deactivation

Making efficient use of natural resources

- Most types of agricultural commodities are infested by molds producing mycotoxins that are hazardous to animals and humans
- Mycotoxins cost the global livestock and agriculture industries billions a year
- DSM (now with Biomin) is a leading pioneer in detecting and combatting almost 400 different types of mycotoxins:
 - Improving animal health and performance
 - Reducing loss of agricultural feed, reducing pressure on land-use by agriculture
 - Reducing loss of income of farmers
- The DSM (Biomin) mycotoxin management portfolio includes solutions with targeted, mycotoxin inhibiting enzymes, a unique technology in the market



Sustell™

Enables positive change for business, societies and the environment

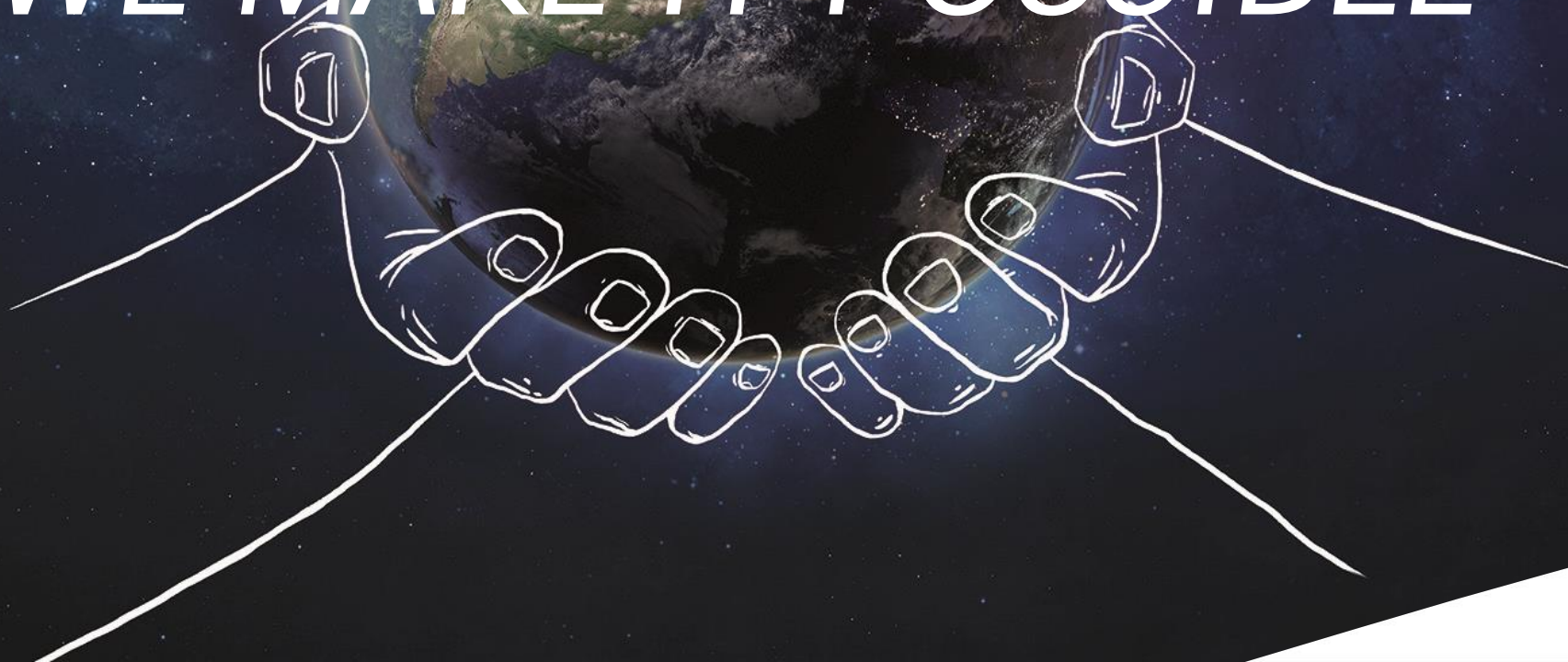
- A global service, built on validated protocols, calculation methodologies and proven processes that meet international standards
- Providing accurate, globally recognized, comparable analyses and results of environmental impact assessments, interventions and improvements throughout the animal protein value chain
- Animal farming companies and the associated value chain, have, for the first time, a powerful solution to measure, compare and improve the sustainability of animal protein





*If not us, who?
If not now, when?*

WE MAKE IT POSSIBLE



Safe harbor

This presentation may contain forward-**looking statements with respect to DSM's future performance and position. Such statements** are based on current expectations, estimates and projections of DSM and information currently available to the company. DSM cautions readers that such statements involve certain risks and uncertainties that are difficult to predict and therefore it should be understood that many factors can cause actual performance and position to differ materially from these statements. DSM has no obligation to update the statements contained in this presentation, unless required by law

A more comprehensive discussion of the risk factors affecting DSM's business can be found in the company's latest Annual Report, which can be found on the company's corporate website, www.dsm.com



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