

# Human Nutrition & Health



## Safe harbor statement

- This factbook may contain forward-looking statements with respect to DSM's future (financial) 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 factbook, 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](http://www.dsm.com)



# Global leader in Human Nutrition & Health

*Keep the world's growing population healthy*

- **Human Nutrition & Health** provides nutritional ingredients & solutions for the food and beverage, dietary supplements, early-life and medical nutrition markets
- Fundamental growth driver is the link between nutrition and health, supported by a number of global megatrends:
  - **Macro-economic:** enabling healthy food for a growing and aging population, local solutions for processed foods for new customers in emerging economies
  - **Behavioral trends:** need for healthier, safer and more sustainable foods (**less salt, less sugar, less fat**) that can be customized to local taste and preferences
  - **Value chain shifts:** being a complete **integrated solution provider** to our customers. capable of creating and delivering tailor-made, **personalized** formulations anywhere
  - **Sustainability:** need for healthier, greener solutions and eco and people friendlier value chains



# Broadest Portfolio of Nutritional Ingredients



## Vitamins

**Vitamins** – Broadest range of fat & water soluble vitamins; Essential ingredients required for growth and well-being ranging from fat-soluble vitamins (A, D, E, K) to water-soluble vitamins (C, all B vitamins, folic acid and pantothenic acid). Vitamins aid metabolism, growth and physical well-being



## Carotenoids

Natural source & natural-based beta carotene, lutein, zeaxanthin; In addition to vibrant colors, **carotenoids** will give your products healthy benefits. Certain carotenoids work as antioxidants in the body to protect cells, tissues and organs against the damaging effects of free radicals, which may contribute to the development of disorders such as cancer, heart disease and eye diseases



## Nutritional Lipids – Omega's

DSM is the global leader in providing **nutritional lipid solutions (ARA/EPA/DHA)**, with a portfolio that includes market-leading products in both fish and algal-source omega-3s, as well as ARA (arachidonic acid), the primary omega-6 fatty acid, important for optimal growth and development of the infant brain



## Enzymes & Cultures

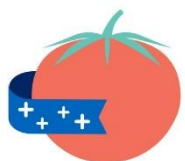
DSM offers solutions for digestion support through optimal nutrient breakdown. In food & beverage, **enzymes and cultures** enhance taste, texture or act as processing aids functioning as a catalyst for biochemical reactions

# Broadest Portfolio of Nutritional Ingredients



## Probiotics, Prebiotics

Gut health goes beyond issues with digestion, but also relates to many aspects of overall health. The role of the gut microbiome is of great importance. Given the complexity of the human gastrointestinal tract and the increase in clinical studies, there is clearly potential for the landscape of gut health products, including [prebiotics and probiotics](#). DSM's Culturelle (i-Health) is the no 1 probiotic brand in the US



## Nutraceuticals

[Nutraceutical ingredients](#), such as Fruitflow®, OatWell®, resVida®, Reducose®, ALL-Q™, deliver the optimal balance of microflora in the gastrointestinal tract enabling consumers to perform at their peak, as well as helping cope with future health concerns such as cardiovascular disease and weight management



## Active pharmaceutical Ingredients

[Vitamins and Lipids for pharmaceutical applications](#). Our commitment to delivering a sustainable supply of high quality APIs, together with our unique innovation expertise, make us the ideal partner for the development of over-the-counter products and prescription medications

## Offering a broad range of (premix) solutions

*DSM is more than a ingredients supplier – DSM is the preferred partner in all stages of the product life cycle*



(Customized)  
Premix  
Solutions

**Customized blends** of desired functional ingredients in one single, efficient, homogenous **premix**. DSM delivers more than nutrition. DSM offers an advantage in every phase of product development and processing DSM can combine two, ten or even dozens of nutritional ingredients in a single premix, sourcing from more than 1,400 ingredients – each carefully tested, qualified and researched specifically for your needs



Coloration  
Solutions

DSM's **color solutions** provide a vast assortment of choices: from pale lemon yellow to vibrant orange and red. Our carotenoid-based colors optimizes coloration costs, maintain uniform consistency throughout the product line, makes products healthier and addresses the growing need for more natural ingredients



Market-Ready  
Solutions

One-stop-shop service. DSM can streamline the product development process and deliver **fully-finished goods**, ready for the retail shelf

## Offering a broad range of (premix) solutions

*DSM is more than an ingredients supplier – DSM is the preferred partner in all stages of the product life cycle*



### Health Benefit Solutions

Health and well-being remain crucial concerns as chronic disease levels rise globally and the world population ages. DSM's [Health Benefit Solutions](#) help customers to develop successful, innovative nutritional products that address major consumers' health and lifestyle trends



### Shelf Life Solutions

One of the main causes of food waste is chemical spoilage or oxidation. This can lead to chemical reactions in food creating browning, staling or moisture reduction. DSM can help prevent spoilage of foods with its expertise and a robust portfolio of products to design tailor-made, efficient [antioxidant solutions](#)



### Personalized Nutrition Solutions

DSM is seen as a clear thought leader in Personalized Nutrition. With a strong heritage in [science-based nutritional solutions](#) and with global footprint, DSM connects dots in the Personalized Nutrition value chain through collaboration with companies, such as MixFit, Panaceutics and Biozoom



# Human Nutrition & Health is addressing 4 key segments

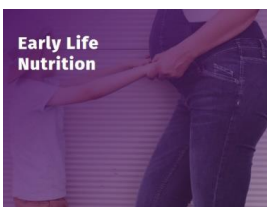
*Food, beverage, dietary supplements, early life nutrition and medical nutrition*



**Dietary supplement** customized for the health needs and desires of today's consumers. Through DSM's end-to-end solutions, DSM supports its customers with product development, consumer insights, smart science and strategic marketing. DSM can even go all the way to delivering finished, market ready products



Helping **food and beverage** manufacturers enhance the nutrient density of food. DSM's commitment to innovation in formulations and applications addresses the changing consumption habits of consumers, simultaneously meeting their needs of convenience, nutrition, value and taste. DSM's customized solutions nourish and improve the performance of our customers' brands



Helping mothers and their children get the best **Early Life Nutrition** for a happy, healthy future. The first 1,000 days between the onset of a woman's pregnancy and her child's second birthday offer a unique window of opportunity for nutrition to shape healthier futures. Nutrition beyond the first 1,000 days is critical to fuel the rapid development that occurs during childhood. Women hoping to become pregnant, pregnant women, infants and children must receive the necessary nutrients at appropriate levels to help set them on a path to a long, healthy life



Optimized **medical nutrition** for people of all ages with medical conditions or special needs. DSM's innovative solutions embrace specialized products for oral nutritional supplements, enteral nutrition and parenteral nutrition, meeting the raised quality and palatability requirements for the needs of patients across all ages, and the elderly. DSM specializes in the development, production and marketing of dietetic foods for special medical purposes in healthcare settings or home treatment, under medical supervision

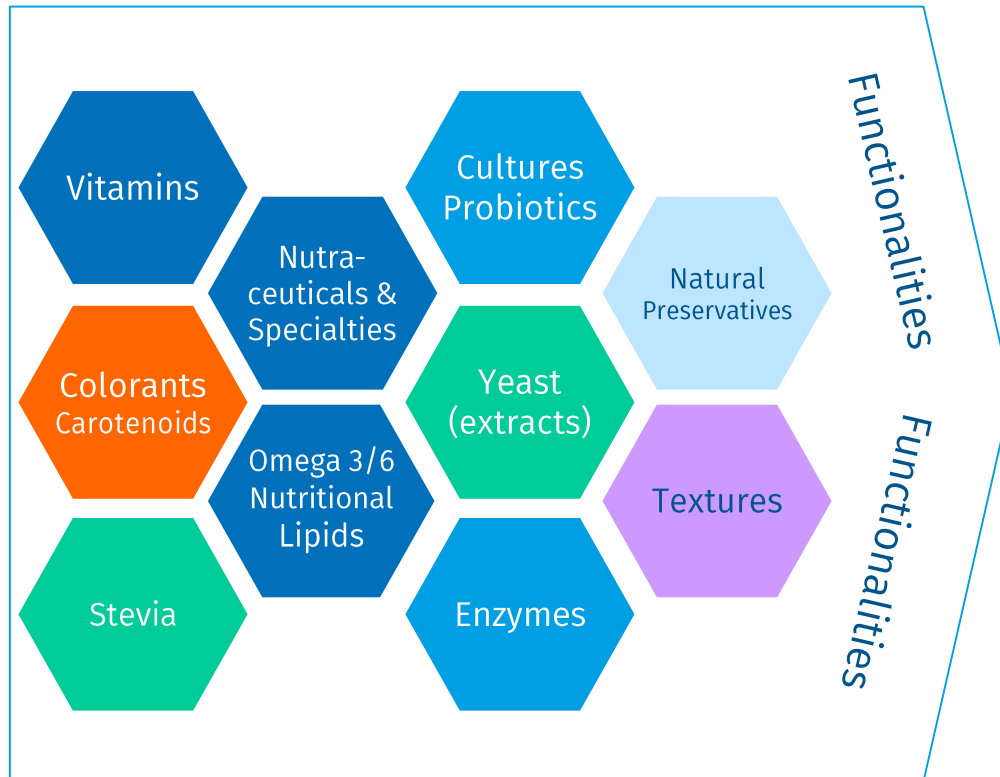




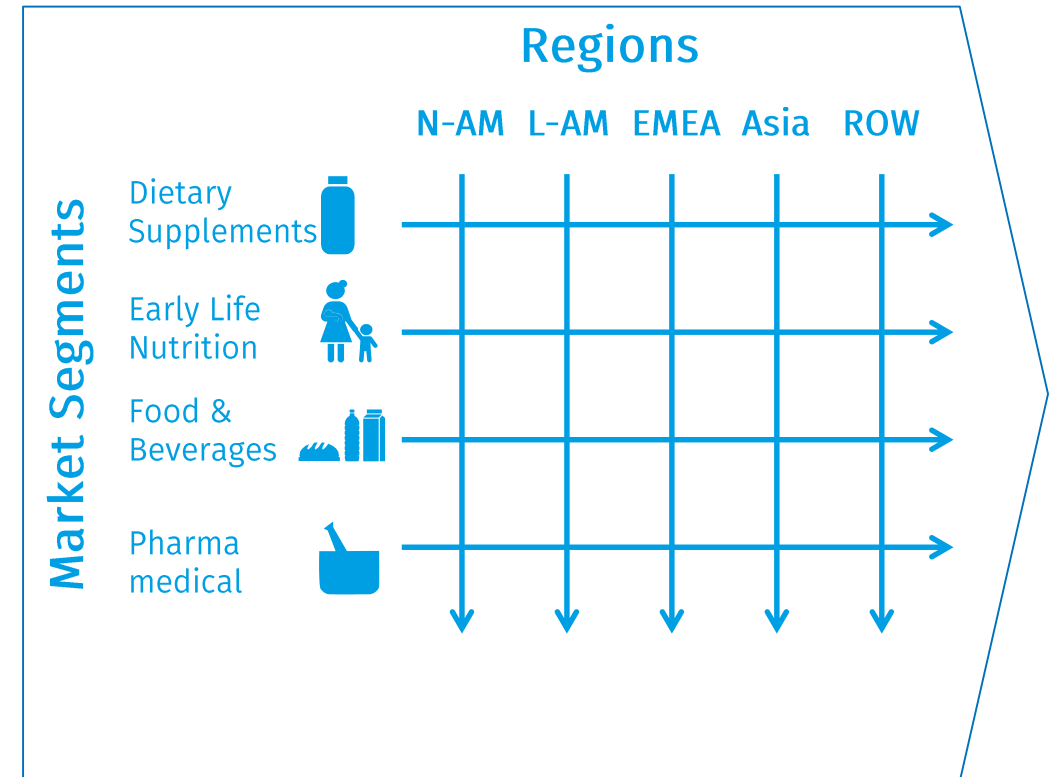
# Nutrition's unique business model

*Broad, global portfolio in nutritional ingredients & global network of (premix) solutions, addressing 4 key market segments*

## Global Products



## (Local) Solutions & Services



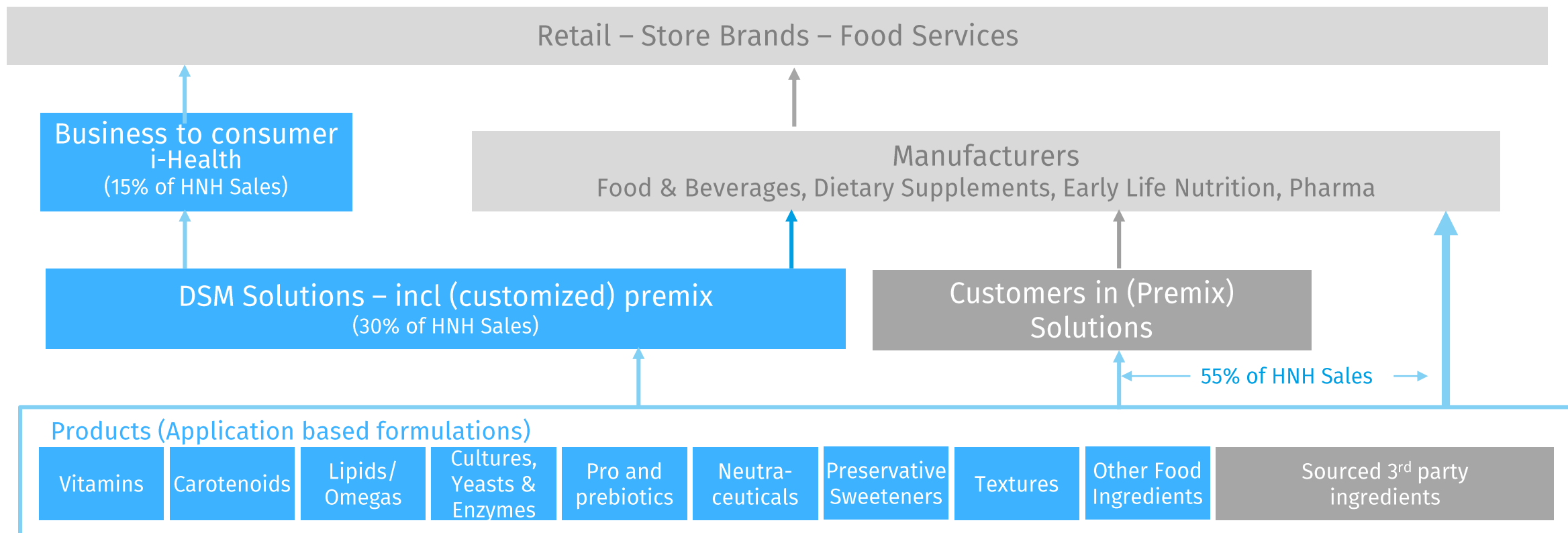
# Human Nutrition & Health (HNH) | value chain

## Food ingredients market



The only integrated premix, vitamin and nutraceutical producer for tailor-made formulations in the value chain

# Human Nutrition | DSM is an integrated value chain player

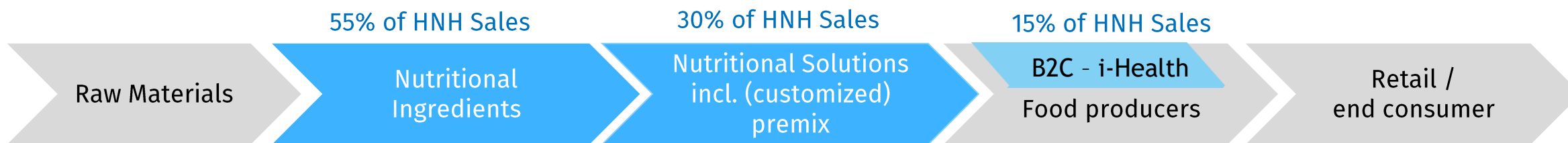


- DSM applies its food ingredients in the (customized) premix solutions it supplies to manufacturers; DSM's (customized) premix solutions represent about 30% of HNH's total sales
- DSM's direct sales to customers (B2C), is via its i-Health line a/o in US and Asia; this represents about 15% of HNH's sales

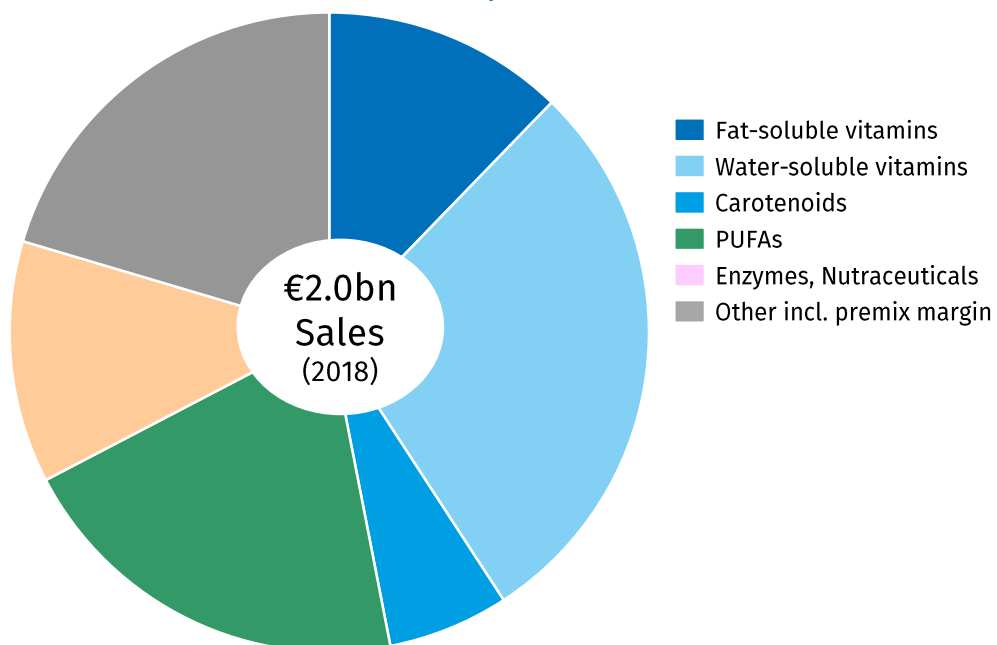
# Human Nutrition | Sales by product, segment and region

€2.0bn sales (2018) diversified across applications, geographies, channel and a complete portfolio

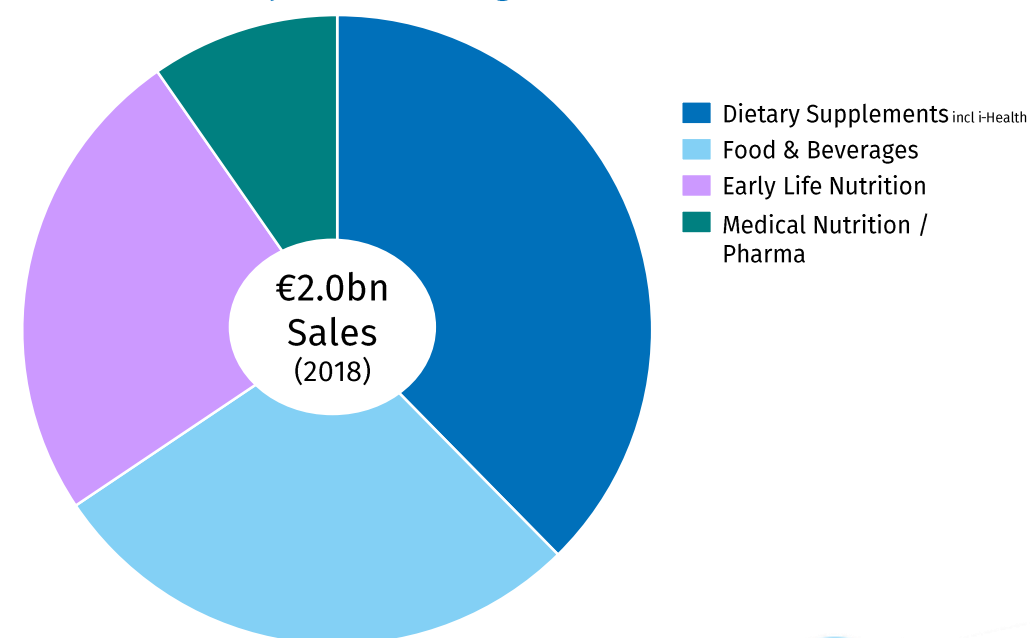
## Food value chain



HNH Sales related to products (%)



HNH Sales by business segment(%)



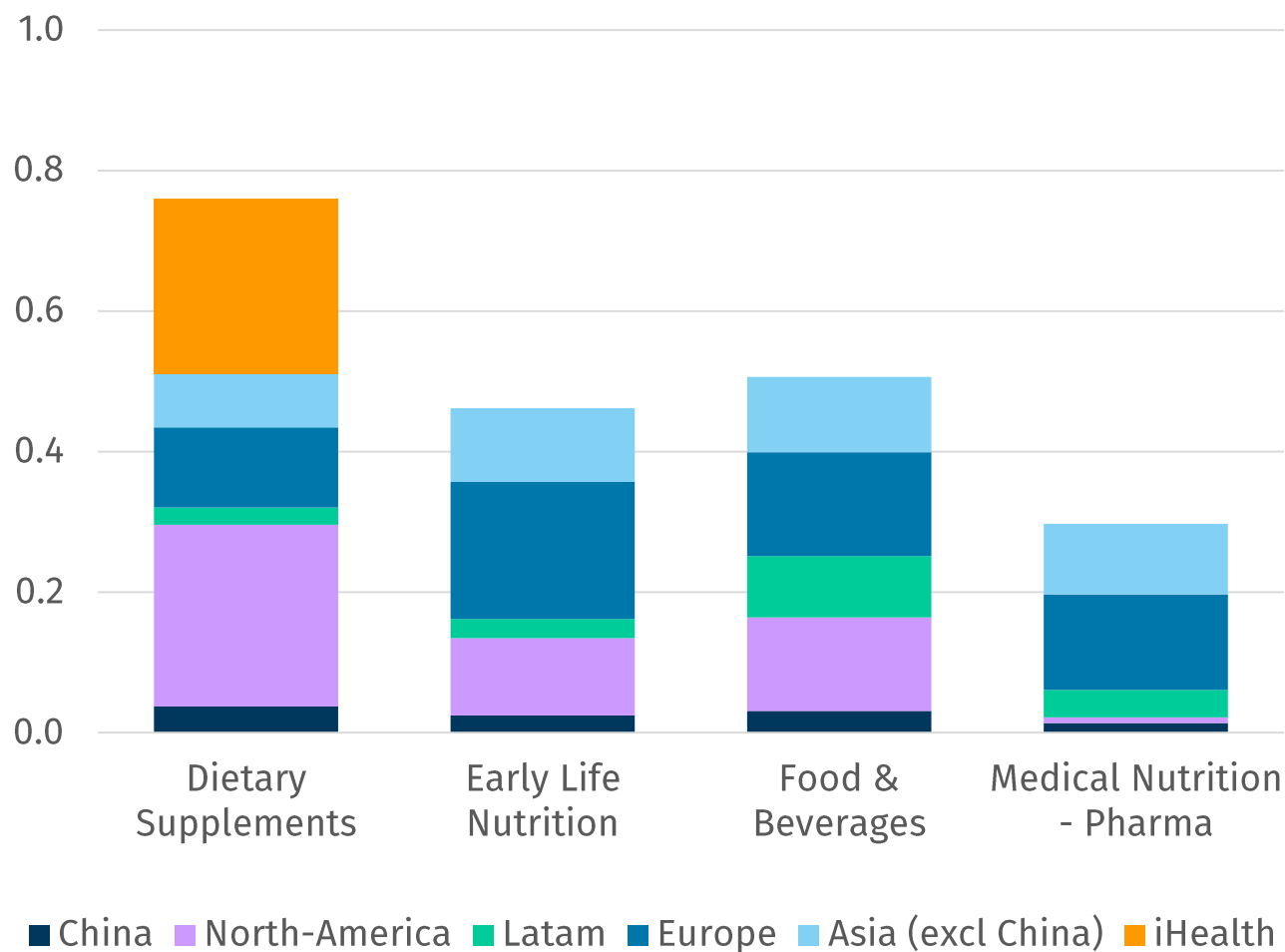
\* In this graph, the sales related to food ingredients such as vitamins, carotenoids, enzymes, lipids, **include** the sales of these products via DSM's own premix solutions



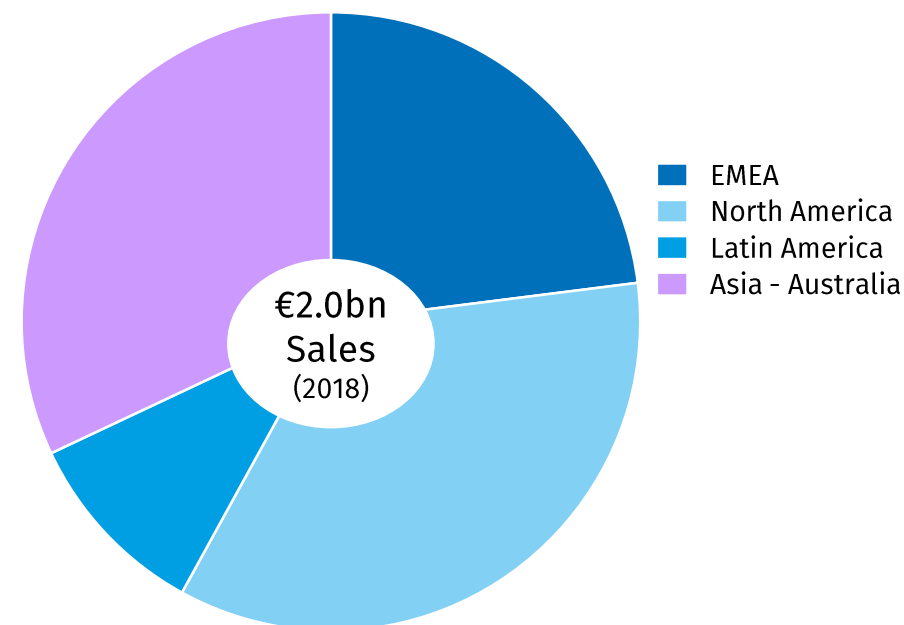
# HNH sales by application & region

€2.0bn sales (2018)

Region &amp; Application



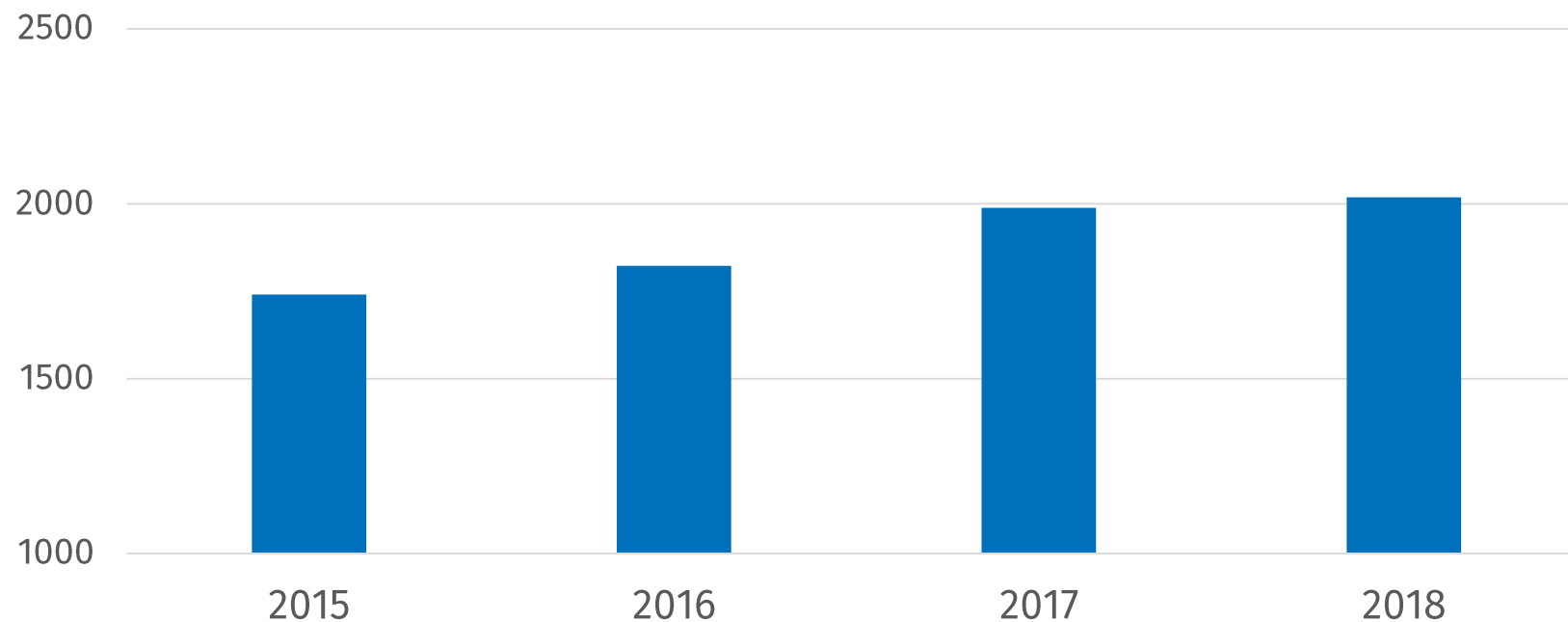
Region



# HNH business continued above-market growth

€2.0bn sales (2018)

Sales (€ million)



6%  
CAGR organic growth  
2016-2018

# Human Nutrition & Health | Strategy 2021

*Disruptive value chain shifts resulting in new opportunities for our Human Nutrition & Health business*

## Food & Beverage

- Prefers **local**, known brands
  - Prefers **healthy** products with less sugar, salt & fat from natural origin
- ▼
- **Local brands focus on marketing & sales** and have limited manufacturing and R&D capabilities
  - **Global brands under pressure** to cut costs - manufacturing and R&D mainly impacted
- ▼
- Requires brand-specific, **multiple ingredient** solutions with **local application support**
  - Requires new, **clean-label ingredients** complementing and/or replacing sugar, salt & fat



## Specialty Nutrition esp. Dietary Supplements

- More **health-conscious** and educated consumers
  - Require **more personalized offers** based on genetic makeup, lifestyle and diet
- ▼
- Dietary Supplement brands with **limited personalization options** through traditional retail
  - Needs **offering beyond the product** e.g. individualized advice, delivery system, diagnostic tools
- ▼
- More **integrated offering** beyond ingredients e.g., delivery systems and diagnostic tools
  - **Consumerization of scientific know-how** into sound advice

# Human Nutrition & Health | Strategy 2021

*Continued above-market organic sales growth*

## Market growth



3-5%

Dietary Supplements



2%

Infant Nutrition



1-2%

Food & Beverages



5-6%

Medical - Pharma

$\Sigma$  around 2-3%

## Human Nutrition & Health growth enhanced by

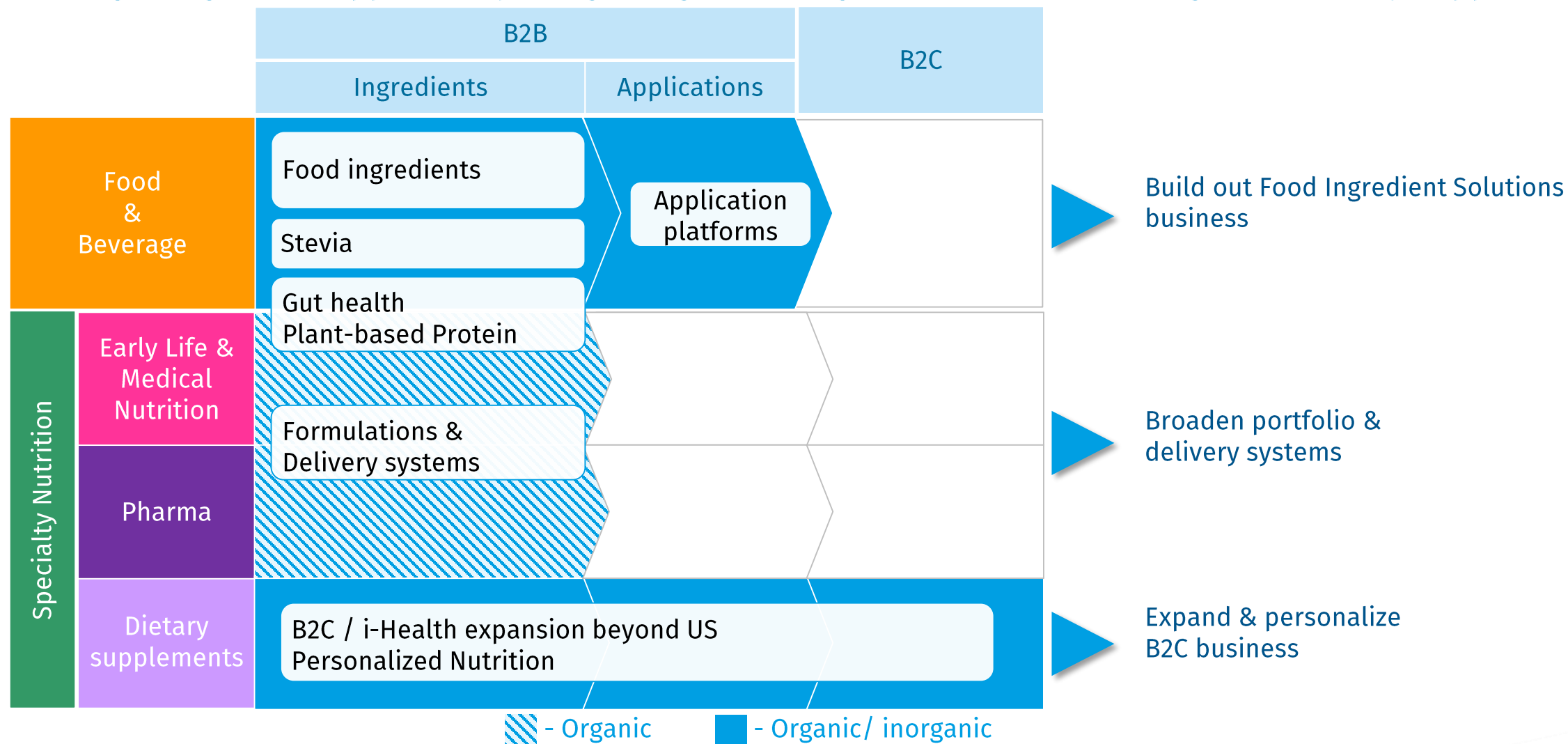
Macro-economic	Health & wellness	Value Chain Shifts	Sustainability
<p>Growing population: new customers</p> <p>Ageing Population</p> <p>Rising Health care costs</p>	<p>“Less of” strategy: Less fat, less salt, less sugar</p> <p>Gut-Health &amp; Microbiome</p> <p>Active Nutrition</p> <p>Personalized Nutrition</p>	<p>Small/new local brands on the rise</p> <p>Big Brands need customized Products</p> <p>Personalized Nutrition</p> <p>Digitalization/E-commerce</p>	<p>Natural/non-artificial</p> <p>Manufacturing:</p> <ul style="list-style-type: none"> <li>• Sustainability</li> <li>• Fermentation</li> </ul>
Organic growth	New Market Opportunities	Forward Solutions	Rise of Biotechnology

$\Sigma$  Above-market (~4-5%) organic sales growth ambition



# Human Nutrition & Health | Strategy 2021

*Continued organic growth supported by inorganic growth targeted at Food & Beverage and Dietary Supplements*



# Fermentative Stevia – Avansya




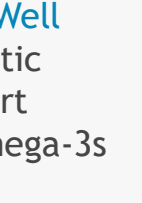
## *Next generation of great tasting Stevia Sweeteners!*

- Consumer interest and awareness on ways to improve their health has also increased the demand for “healthier foods” with reduced fat, sugar and salt. Main objective is to reduce overall calorie intake, yet not to compromise on taste
- To meet this demand, Cargill and DSM combined their efforts to create the joint venture Avansya, to deliver zero-calorie great tasting sweeteners to the market. This partnership combines DSM’s leading biotech know-how and fermentation expertise with Cargill’s global commercial footprint in sweeteners and large-scale fermentation capacity, making sugar reduction a sustainable and affordable reality. Avansya offers a more scalable, more sustainable and low cost-in-use, zero-calorie solution
- Avansya (JV with Cargill) launched in March 2019. Commercial production started in Blair (Nebraska, US) end of 2019. Avansya has commercial volumes available and is already supplying EverSweet to various customers. Further consumer products will launch in the coming months across multiple market segments. Total market for fermentative high-intensity sweeteners is forecasted to be >€3bn by 2025



# Culturelle | #1 selling supplement probiotic brand in the US

*Focus now on global expansion*

 <p><b>Culturelle Adult Chewables</b> New form expands consumer base</p>	 <p><b>Culturelle Digestive Health Ex. Strength</b> Growth from committed loyal consumer base</p>	 <p><b>Culturelle Pro-Well</b> Expands probiotic benefits to heart health with Omega-3s</p>	 <p><b>Culturelle Kids</b> Expands Kids line with new benefits</p>
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- The global dietary supplements probiotics market has been growing 6-7% per year (2015-2019) and is expected to continue to grow above 5%
- New product innovation is helping to fuel this growth
- The market is highly segmented and extremely competitive: product differentiation supported by authenticated health claims is vital for success
- Top-line growth has been achieved by creating consumer demand for Culturelle®
  - Important to understand and validate consumers' health and wellness needs
  - Delivered on those needs across three growth platforms (Digestive Health, Everyday Wellness, and Kids) based around Lactobacillus GG – the leading clinically-studied probiotic strain
  - Positioned Culturelle® as the proven probiotic brand in the broader health and wellness space
- Global expansion strategy focused on distribution and consumer brand-building in Asia (China/Korea) first and Europe later
  - Different local market characteristics require new routes to market
  - Currently building expertise in these new segments
- International marketing supporting ongoing brand- building



# Main sustainability Topics in HNH

Solutions to support plant-based diets / vegetarian trend (vegetarian ingredients, need to fortify vegetarian products...



Affordable nutrition products to overcome malnutrition



Solutions to increase shelf life and reduce food waste (anti-oxidants and to a certain extend our coloration solutions)



Low carbon footprint ingredients supporting our and our customers' science-based targets



Embedding sustainability in our production site



Addressing malnutrition with our Nutrition Improvement solutions and working with our partners





# Fighting Hidden Hunger

*Providing nutrition for the most vulnerable*



DSM is the partner of choice in the global fight against nutritional deficiencies, also known as hidden hunger. Through our **Nutrition Improvement** activities, DSM has been offering high quality, affordable and innovative nutritional solutions in the developing world for decades. The support DSM provides is tailored to the needs of local communities and DSM continues to expand its capabilities. Above all, DSM is passionately committed to achieving a brighter future for everyone through both DSM's solutions and collaborating with a wide variety of partners and organizations



**Africa Improved Foods (AIF)** is a public-private partnership involving a/o DSM, the UN WFP and the Government of Rwanda providing a scalable and sustainable solution to malnutrition via local production of highly nutritious foods. US\$65m has been invested in Rwanda already in best-in-class technology, operational since December 2016. AIF is a social enterprise and embedded in its business model is a comprehensive strategy to reduce poverty, create jobs and address stunting and malnutrition through partnerships with nonprofit institutions, such as WFP & Governments, as well as making affordable commercial products for the mass market. Enough nutritious foods are being produced to reach over 1 million children a day.

DSM is inspired by the solid evidence that the 1000 days from conception to the second birthday of an infant's life, are critical for a child's physical and mental development





**BRIGHT SCIENCE. BRIGHTER LIVING.™**