Purpose Led, Performance Driven

DSM Factbook 2020

Introduction to DSM
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.
Royal DSM is a purpose-led science-based innovative company in Nutrition, Health and Sustainable Living
DSM is the company that ....

- Is a global leader in *Nutritional ingredients* for Animal Nutrition & Health, Human Nutrition & Health
- Active in *Specialty Materials*, providing solutions for Sustainable Living
- Has a clear *strategic growth path*, growing the company:
  - *Performance driven*, delivering on its ambitious financial targets over the last years
  - *Purpose led*, delivering on its responsibilities towards people and planet
- Has an *impressive innovation pipeline* with large projects addressing key societal needs and the UN SDGs
- Has a *shareholder friendly dividend* policy and is determined to continue to create *sustainable value for all its stakeholders*
DSM today
Global leader in animal nutrition, human nutrition and sustainable living

Key figures

GROUP ~€10bn sales
~20% sales from products and applications introduced in the last 5 years

Global footprint
200 locations over the world
45% sales from emerging economies
EMEA sales 35% - Americas 35% - Asia/ROW 30%

A global & diverse workforce
106 nationalities represented
~23,000 highly engaged employees
~30% female / male ratio

A broad, global Nutrition business and a focused specialty materials portfolio

Animal Nutrition & Health
~one third of DSM 2018 sales
Nutritional ingredients addressing the rising global demand for healthy animal protein around the world, Ingredients contributing to high-quality food, while looking after the welfare of the animals that produce it (and the planet we share with them)

Human Nutrition & Health
~one third of DSM 2018 sales
Nutritional ingredients keeping the world’s growing population healthy addressing various markets including food & beverages, dietary supplements, early-life nutrition, and medical nutrition

Specialty Materials
~one third of DSM 2018 sales
Advanced materials for high-performance, light-weight, safe and sustainable applications in a/o automotive, electric & electronics, building & construction
Building on an impressive history and has undergone a successful transformation

*From coal mining into (bulk) chemicals into nutrition and sustainable living*

- Formation of coal mining company 'De Nederlandse Staatsmijnen' (Dutch State Mines)
- Continuous shift to (petro) chemical and fertilizer products incl. industrial chemicals and raw materials for synthetic/polyethylene fibers and yarns
- DSM listed on the AEX stock exchange
- Acquisition of Gist-Brocades which was integrated into the DSM Life Science cluster
- Sale of Petrochemicals business
- Acquisition of Roche's Vitamins & Fine Chemicals division, subsequently renamed DSM Nutritional Products
- Focus on Life Sciences and Materials Sciences and divestment of non-core businesses Melamine, Agro, Elastomers
- DSM celebrates 150 years in biotechnology innovation
- Divestments of holdings in DSM Sinochem, Patheon and Fibrant

**Extensive experience in chemical synthesis and biotechnology**

**Est. 1902**
Gist-Brocades Biotechnology

**Est. 1869**
Royal DSM Chemistry, energy, polymer technology

**Est. 1934**
Hoffman La Roche Vitamins Chemical synthesis & biotechnology
Over the last strategy periods, DSM streamlined and simplified its portfolio by exiting (bulk) chemicals and accelerating its transformation into becoming a Nutrition company.

Significant portfolio transformation (in % of DSM sales):

- 1995: Petrochemicals, Base Chemicals & others
- 2000: Polymer Intermediates & Composite Resins, Pharma
- 2005: Materials, Innovation Center, Nutrition
- 2010: Materials, Innovation Center, Nutrition
- 2019: Nutrition

Legend:
- Petrochemicals, Base Chemicals & others
- Polymer Intermediates & Composite Resins
- Pharma
- Innovation Center
- Materials
- Nutrition
Successful M&A accelerated DSM’s transition into a global leader in Nutrition

DSM became a more global, innovative & sustainable company through portfolio transformation

- Strengthened our broad & global Nutrition business with nutritional ingredients for ruminants (Tortuga); marine-based poly-unsaturated fatty acids (Ocean Nutrition Canada); algae & fungi based (fermentation) Omega-3 and Omega-6 (Martek); tailored (integrated) premix solutions (Fortitech); vitamins (Jiangsu, Nenter) and textures/hydrocolloids (a/o Andre Pectin)

- Upgraded Materials by exiting several non-core businesses, focusing on and expanding in high-end specialty solutions, including Dyneema®, acquisition of SRF (India) specialty materials business. Added biomedical solutions (Kensey Nash), and advanced solar
DSM today has a broad range of sciences and technologies capabilities

Enabling DSM to leverage its technologies for developing innovative sustainable solutions

- Fundamental understanding of science behind Nutrition and Materials
- Capability to develop new ingredients and materials
- Biotech competences providing sustainable alternatives for chemical synthesis, and plant/animal-derived ingredients
- Fundamental understanding of material synthesis/characterization and capability to convert in Sustainable Living applications
- R&D investments at 5% of sales
DSM offers products & solutions to a wide range of end-markets

- DSM addresses with its products and solutions some of the world’s biggest challenges - while creating economic, environmental and societal value for all its stakeholders – customers, employees, shareholders, and society at large.

- DSM delivers innovative solutions for e.g. green products and applications, medical devices, new mobility and connectivity, human nutrition, animal nutrition and personal care.
DSM’s workforce has become very international

*60% of employees (2018) is based outside Europe*

- North America 3,400
- Europe 9,500
- Asia 6,800
- Latin America 2,200
- ROW 300

~23,000 Employees, ~60% Employees outside Europe - Employee engagement: 76%
Successfully delivered on financial targets

**DSM has been outperforming on Adjusted EBITDA growth and ROCE growth since 2015**

### High single-digit % annual Adjusted EBITDA (€m) growth

- **~13% CAGR**
  - 2015: 1,075
  - 2016: 1,262
  - 2017: 1,445
  - 2018: 1,822

  **290 Temporary vitamin benefit**

### Underlying business

- 1,532

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### High double-digit basis point annual ROCE (%) growth

- **~190 Avg. bps**
  - 2015: 7.6%
  - 2016: 10.4%
  - 2017: 12.3%
  - 2018: 16.8%

  **3.5% Temporary vitamin benefit**

### Underlying business

- 13.3%
Successfully delivered

*DSM outpaced market growth in both Nutrition and Materials segments*

Underlying sales growth\(^1\)(€m)

<table>
<thead>
<tr>
<th>Human Nutrition</th>
<th>Animal Nutrition</th>
<th>Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>~5% CAGR 2016-18</td>
<td>~7% CAGR 2016-18</td>
<td>~5% CAGR 2016-18</td>
</tr>
<tr>
<td>1,741</td>
<td>2,269</td>
<td>2,528</td>
</tr>
<tr>
<td>1,823</td>
<td>2,399</td>
<td>2,513</td>
</tr>
<tr>
<td>1,939</td>
<td>2,660</td>
<td>2,825</td>
</tr>
<tr>
<td>1,989</td>
<td>2,749</td>
<td>2,913</td>
</tr>
</tbody>
</table>

\(^1\)CAGR and average bps of underlying business
Strategy 2021

Purpose led, performance driven
DSM; a purpose led, performance driven company

*We balance the need to generate profitable growth with the need to have a positive contribution to the world*

**Doing well**
- Focus on profit

**Doing good**
- Improving the world

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10 years ago
- Start DSM’s new/next sustainability journey

Today
- DSM’s purpose approach is fully anchored in its strategy **Creating Brighter Lives for All**

10 years from now
- Good financial returns will go together with purpose
DSM’s key competences are addressing the UN Sustainable Development Goals

By focusing on sustainable solutions, DSM can grow faster and reduce its cost and risk profile

Please see DSM’s Integrated Annual Report 2018 for definitions and additional information
Strategy 2021: Growth & Value – Purpose led, Performance driven

Our purpose is to create brighter lives for all

<table>
<thead>
<tr>
<th>With our Employees</th>
<th>With our Customers and Suppliers</th>
<th>With our Shareholders</th>
<th>For Society</th>
</tr>
</thead>
</table>

Science-based competences in Nutrition, Health and Sustainable Living

Global Megatrends

Sustainable Development Goals

Growth in focus domains: Purpose led, Performance driven

Nutrition & Health

Climate & Energy

Resources & Circular Economy

Sustainable living

We are already reaching ~2.5 billion people worldwide

More engagement

More sustainability

More growth
Two ambitious *financial* targets for profit growth & cash generation.....

### 2021 Financial Targets

- High single-digit percentage annual Adj. EBITDA increase
- ~10% average annual Adj. Net Operating Free Cash Flow increase

### Ambitions underpinning DSM Group targets

1. **Sales**
   - Above-market sales growth for Group, Nutrition and Materials

2. **Adj. EBITDA margin**
   - Nutrition: >20%
   - Materials: 18-20%

3. **Working capital**
   - Reduce by 50 bps annually to ~16%

4. **Capex**
   - ~6.5% of sales

5. **ROCE**
   - ~1%-point increase per annum

6. **Adj. EPS**
   - Increase ahead of Adj. EBITDA growth
Strategy 2021 | the following ambitions underpin our financial targets
For the period 2019-2021

DSM will continue its above-market growth
- Above-market growth for total DSM, Nutrition and Materials
- Supported by a well-balanced geo-split (45% sales will come from high-growth economies)
- About 20% of sales will come from innovations

DSM will improve margins by further shifting to higher-margin, specialty solutions
- Support growth while retaining efficiency through a returns-focused M&S organization and anchoring of support function savings

DSM aims to bring down Average Total Working Capital by around 50 basis points annually
- Customer-centric supply chain & digitization enable inventory reduction
- Automation & data analytics support accounts receivable optimization

Disciplined CAPEX allocation: investments focused on growth and efficiency
- About 6.5% of annual sales
- Focus on enhancing growth capabilities (i.e. 2/3 CAPEX in Nutrition)
- ~50-60% of CAPEX focused on growth

EBITDA growth and capital efficiency drive ROCE improvement
- Around 100 bps increase per annum & ROCE towards ~15%
### Strategy 2021 | Sustainability ambitions are integral part of our strategy

*Stepping-up our ambitions regarding the reduction of GHG emissions, energy efficiency*

<table>
<thead>
<tr>
<th>Realization 2018</th>
<th>2021 / 2030 Ambitions</th>
</tr>
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<tbody>
<tr>
<td>~8%¹</td>
<td>30% absolute reduction by 2030 (vs. 2016)²</td>
</tr>
<tr>
<td>1.4%³</td>
<td>&gt;1% average annually till 2030</td>
</tr>
<tr>
<td>41%</td>
<td>75% by 2030</td>
</tr>
<tr>
<td>76%</td>
<td>&gt;75% by 2021</td>
</tr>
<tr>
<td>0.33</td>
<td>&lt;0.25 by 2021</td>
</tr>
<tr>
<td>62%⁴</td>
<td>&gt;65%⁵ by 2021</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>▪ GHG absolute reduction (vs. 2016)</th>
<th>▪ Energy efficiency improvement year-on-year</th>
</tr>
</thead>
<tbody>
<tr>
<td>▪ Purchased renewable electricity</td>
<td>▪ Employee engagement favorable score</td>
</tr>
<tr>
<td>▪ Safety Frequency Recordable Index</td>
<td>▪ Brighter Living Solutions</td>
</tr>
</tbody>
</table>

¹ We estimate the effect of the underlying structural improvements in absolute GHG emissions to be roughly 8% versus 2016, while the total absolute GHG emission reduction versus 2016 is approximately 18% (from 1.5 million tons to 1.23 million tons)

² An additional Scope 3 intensity reduction target of 28% by 2030 (versus 2016) has been agreed which, together with our Scope 1 + 2 target, meets the criteria for a Science-Based Target

³ Our energy efficiency improvement was 5.1% over the past strategic period

⁴ Excluding temporary vitamin effect

⁵ KPI will be updated as part of the Responsible Care Plan updated in 2020
Sustainability as growth opportunity
Addressing the Sustainable Development Goals & grow in the focus domains

Nutrition & Health
- Provide adequate macro-/micronutrients
- Fight malnutrition (undernutrition, obesity)
- Enable sustainable animal protein production
- Help reduce salt, sugar, saturated fat
- Fight antimicrobial resistance
- Support health & longevity w/biomedical solutions

Climate & Energy
- Reduce own operations’ greenhouse gas emissions (GHG)
- Enable customers’ reductions of emissions (GHG, nitrogen)
- Advocate a low carbon economy & carbon pricing
- Step up renewable energy

Resources & Circularity
- Enable circular & bio-based solutions: reduce, replace, extend, design, recover
- Increase resource efficiency & yields
- Reduce food loss and waste
- Promote sustainable land use for farming and food production
- Preserve marine biodiversity

Partnerships for the broadest reach:

- WFP
- World Food Programme
- unicef
- World Vision
- Partners in Food Solutions
- Scaling Up Nutrition

DSM
Sustainability | DSM’s performance recognized by benchmarks

Leading in integrating sustainability in operations and business

- 3rd year on Fortune’s Change the World list (2018)
- AAA - Top-rating in ESG index (2019)
- Sector Leader in ESG ranking (2020)
- PrimeRating (2019)
- Constituent (2018)
Corporate Governance

The General meeting of Shareholders appoints members of the Managing Board and Supervisory Board.

The Supervisory Board supervises the policy pursued by the Managing Board, its performance and the company's general course of affairs. The SB approves the annual financial statements. It is organized around committees including Audit, Nomination, Remuneration and Sustainability Committees. Members are appointed for 4 years (reappointed up to 8 years).

The Managing Board is responsible for the Strategy, portfolio management, deployment of human and financial capital, risk management, financial and sustainability performance.

The Executive Committee focuses on strategy and direction, review of business results, functional and regional strategies, budget-setting, and people and organization. It includes the MB members and four senior Managers (currently the leaders of Nutritional Products, Food Specialties & Strategy, Innovation center and People & Organization).
Managing Board

Feike Sijbesma (Dutch, 1959)
- CEO & Chairman of the Managing Board since May 2007, member of the MB since 2000.
- Joined DSM in 1998 with the acquisition of Gist-Brocades (from 1987)

Geraldine Matchett (British, French, Swiss, 1972)
- CFO and Member of the Managing Board since 2014
- Joined DSM in 2014

Dimitri de Vreeze (Dutch, 1967)
- Member of the Managing Board since 2013
- Joined DSM in 1990

Executive Committee

Chris Goppelsroeder (Swiss, 1959)
- President and CEO, DSM Nutritional Products since 2013
- Joined DSM in 2003 with the acquisition of Roche Vitamins & Fine Chemicals

Patricia Malarkey (British/American)
- Chief Innovation Officer
- Joined DSM in 2019

Philip Eykerman (Belgian, 1968)
- Executive Vice-President Corporate Strategy & Acquisitions
- Joined DSM in 2011

Judith Wiese (German)
- Executive Vice President Group People & Organization
- Joined DSM in 2017
Supervisory Board

Rob Routs (Dutch, 1946), Chair
- First appointed: 2010. Chair of the Nomination Committee, member of the Remuneration Committee
- Last position held: Executive Director Downstream and member of the Board of Royal Dutch Shell plc

Pauline van der Meer Mohr (Dutch, 1960)
- First appointed: 2011. Chair of the Remuneration Committee, member of the Nomination Committee
- Last position held: President of the Executive Board of Erasmus University Rotterdam

John Ramsay (British, 1957)
- First appointed: 2017. Chair of the Audit Committee, member of the Remuneration Committee
- Last position held: Chief Financial Officer of Syngenta AG

Fritz van Paasschen (Dutch and American, 1961)
- First appointed: 2017. Member of the Audit Committee Sustainability Committee
- Last position held: CEO of Starwood Hotels and Resorts

Eileen Kennedy (American, 1947)
- First appointed: 2012. Chair of the Sustainability Committee, member of the Nomination Committee
- Position: Professor Nutrition Friedman School of Nutrition Science & Policy (Tufts, Boston, USA)

Victoria Haynes (American, 1947)
- First appointed: 2012. Member of the Audit Committee and Remuneration Committee
- Last position held: President and CEO of the Research Triangle Institute International

Pradeep Pant (Singaporean, 1953)
- First appointed: 2016. Member of the Audit Committee and member of the Sustainability Committee
- Last position held: EVP & President, APAC and EMEA of Mondelēz International

Erica Mann (Australia, 1958)
- Last position held: Member of the Board of Management of the Bayer Group and Global President of Bayer’s Consumer Health Division.
BRIGHT SCIENCE. BRIGHTER LIVING.
Nutrition
Safe harbor statement

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Product Portfolio Nutritional ingredients

*Differentiation in a broad range of formulations and solutions (including premix)*

- Global leader in nutrition, with broadest portfolio of nutritional ingredients
- DSM serves the global industries for animal feed, food and beverages, infant nutrition, dietary supplements, medical nutrition and personal care
- DSM is uniquely positioned in all steps of the feed and food value chains: the production of nutritional ingredients, their incorporation into sophisticated forms, and the provision of tailored premixes and forward solutions
**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)

**Carotenoids** – Essential ingredients that are important in nutrition. In addition to vibrant colors, carotenoids will give your products health benefits. 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.

**Polyunsaturated fatty acids** (‘PUFAs’) are critical for (the development of) proper brain function, cardiovascular and eye health, immune and inflammatory responses and the production of hormone-like molecules. Omega-3 and omega-6 are used in food, dietary supplements and infant nutrition and are manufactured from algae, fungi as well as fish oil.

**Enzymes** improve feed conversion leading reduced costs of feed while at the same time improved ecological footprint of animal protein production. In food & beverage, enzymes and cultures enhance taste, texture or act as processing aids functioning as a catalyst for biochemical reactions.

**Gut health** goes beyond issues with digestion, but also relates to many aspects of overall health. The role of the gut health products, including prebiotics and probiotics, is of great importance both in human and in animal feed (where it can act as replacement for antibiotics growth promoters).
Minerals are needed in very small amounts in food and feed. Both human and animal need certain minerals for instance to build strong bones and teeth and turn the food into energy. As with vitamins, a healthy balanced diet should provide all the minerals needed to work properly.

Savory/yeast extracts – Extracts and process flavors to enhance taste while reducing salt in snacks, ready-meals, sauces, soups and meat

Nutraceutical ingredients – Deliver the optimal balance of microflora in the gastrointestinal tract of animals optimizing nutrient absorption, while in human nutrition, nutraceutical ingredients enable consumers to perform at their peak, as well as helping cope with future health concerns such as cardiovascular disease and weight management.

Personal Care and aroma intermediates – Ingredients for aromatic scents, detergents and perfumes. UV-filters – Range of high performing UV-A and UV-B filters for skin and hair applications and Skin Bio-actives – Range of vitamins, synthetic peptides and natural extracts for skin care markets.

Hydrocolloids - gellan gum, xanthan gum and pectin solutions that boost mouthfeel, stabilization and suspension performance in food and beverages, personal care, home care and other specialty industrial applications.
Differentiation in a broad range of formulations and solutions (including premix)

- A broad range of technologies to transform the nutritional ingredients into a different state of presentation, e.g. a fat-soluble vitamin oil into a powder form.
- Allows for maximum differentiation in terms of stability, shelf-life, heat resistance, bio-availability, physical properties

**Examples of forms**

- Spray dried
- Beadlet
- Multi-layer micro encapsulate
- Flavor flake

- Through customized blending of active ingredients and/or forms, DSM offers its clients regional and segment-specific finished products solutions
- A broad network of around 60 premix plants allows DSM to offer tailor-made, customer-driven solutions, i.e. global products & local solutions
Global leader in Nutrition, active over full value chain

Broad, global portfolio differentiated formulations and solutions

DSM’s Food- Feed – Pharma & Personal Care value chain

2018* Sales by end-market (%)

2018* Sales split over value chain (%)

2018 Sales* related to ingredient (%)

* The 2018 sales is the 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
Broader portfolio is providing resilience
*With limited exposure to single customers or product lines*

- Largest customer represents less than 3% of 2018 Nutrition sales
- DSM's overall gross margin today relies on many products and therefore tends to be more resilient
- Product range includes ~100 product lines
- Largest profit contributor < 10% of profit
- Several products have a strong IP position

*The sales is the total 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. Including this temporary vitamin effect, 2018 sales was €6.1bn*
Nutrition - 2018 sales (€5.7bn* underlying)

Key financial data

<table>
<thead>
<tr>
<th></th>
<th>Sales (€ million)</th>
<th>% organic growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>5000</td>
<td></td>
</tr>
<tr>
<td>2016</td>
<td>5000</td>
<td></td>
</tr>
<tr>
<td>2017</td>
<td>5000</td>
<td></td>
</tr>
<tr>
<td>2018</td>
<td>5000</td>
<td></td>
</tr>
</tbody>
</table>

* The €5.7bn sales is the total 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. Including this temporary vitamin effect, 2018 sales was €6.1bn
**Financials**

<table>
<thead>
<tr>
<th>Sales (€m) and organic sales growth (%)*</th>
<th>Adj. EBITDA (€m) &amp; Adj. EBITDA margin (%)*</th>
<th>Adj. EBIT (€m) &amp; Adj. EBIT margin (%)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>4,963 5,169 5,579 5,722</td>
<td>822 931 1,053 1,117</td>
<td>535 645 770 821</td>
</tr>
<tr>
<td>6 5 8 7</td>
<td>16.6 18.0 18.9 19.5</td>
<td>10.8 12.5 13.8 14.4</td>
</tr>
</tbody>
</table>

**ROCE (%)**

<table>
<thead>
<tr>
<th>10.3 12 14.1 14.7</th>
<th>Capital employed (€m) (at 31 Dec.)</th>
<th>Capital expenditure (€m) (accounting)</th>
</tr>
</thead>
</table>

* 2018 numbers presented here are the 2018 numbers 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.
Nutrition’s unique business model
Broad, global portfolio in nutritional ingredients & local solutions (incl. premix)
Five Key macro trends driving DSM’s growth in Animal & Human Nutrition
Population growth, health & wellness, integrated & personalized solutions and sustainability

- Antibiotic resistance
- Environmental footprint
- Overfishing
- Greenhouse gas emissions

New Market Opportunities

Growth & Productivity
Health & Wellness
Value Chain Shifts
Macro Economy
Sustainability

Human Nutrition & Health

Food & Beverage
- Focus on M&S
- “Less salt, less fat, less sugar” strategy

More integrated application-based offers

Specialty Nutrition
- Personalization
- Vertical integration

Forward integration opportunities

Strategy
Business model in Nutrition
Basis for market outperformance

Market Growth
- 2-3% Poultry
- 1-2% Swine
- 0-1% Ruminants
- 5-6% Aqua
- 4-5% Pet

Sales by Species

Market Growth
- 3-5%

Sales by Segment
- 2% Infant Nutrition
- 1-2% Food & Beverages
- 5-6% Medical - Pharma

∑ around 2-3%

Outgrowing the complete feed equivalent market through premix, innovation and B2F, leveraging its unique business model

Outgrowing the relevant market through local solutions, forward integration and i-Health expansion
Ambitions for Nutrition underpinning DSM’s 2021 Targets
Nutrition’s global Presence & unparalleled local network
Animal Nutrition & Health (ANH)
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Animal Nutrition & Health (AN&H) | healthy animals, people & planet

Creating science-based **Nutritional Solutions** that contribute to high-quality food, while looking after the welfare of the animals that produce it and the planet

- DSM offers the most comprehensive science-based **nutrition solutions**, based on its very broad portfolio of **nutritional ingredients** including: vitamins from A to Z, enzymes, eubiotics, carotenoids, lipids, minerals and other specialties:
  - Nutritional Ingredients **increase the animal protein production yield**, which helps satisfying growing global demand for healthy protein brought upon by population growth and rising standards of living
  - Nutritional Ingredients also **improve animal health & wellness** and **reduce the environmental impact of farming** as less resources are needed to produce the same amount of animal protein
- DSM is differentiating its nutritional ingredients in **forms**, with various different physical properties depending on application, such as: state of matter, shape, purity, color, solubility, heat resistance
- Through an unique global network of **local premix facilities**, DSM works together with its customers to develop innovative solutions that satisfy specific needs, including the sustainability and commercial challenges we face in how we nurture the world
- DSM is **unique with this business model of “Global Products and Local Solutions”**. We have the most complete portfolio of ingredients, have a global network and are integrated along the value chain in premixes and solutions
- Our solutions are focused on **domesticated livestock** including poultry, pigs, ruminants and farmed fish, as well as companion animals, with solutions formulated specifically for these species
Animal Nutrition & Health (ANH) - a unique business model
Complete portfolio of Nutritional Ingredients in combination with global network of local premix facilities
ANH - complete portfolio of **Nutritional Ingredients**
Broader portfolio of **Nutritional Ingredients** for animal feed

**Vitamins**
Vitamins are essential for well-being and good health. They play many crucial roles in farm animals in areas including: bone formation, disease resistance, feed efficiency, growth, fertility, and egg production.

**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.

**Enzymes & Eubiotics**
Enzymes improve feed conversion leading reduced costs of feed while at the same time improved ecological footprint of animal protein production. Gut health goes beyond issues with digestion, but also relates to many aspects of overall health. The role of the gut health products, including eubiotics, is of great importance in animal feed, in order to enable farmers displacing the use of antibiotics.

**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.
ANH - Formulations & Premix Solutions

Differentiation of ingredients in a broad range of Formulations and Premix Solutions

- A broad range of technologies transform the Nutritional ingredients into a different state of presentation: 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.

Examples of forms

Spray dried  Multi-layer micro encapsulate  Flake

- DSM offers its clients regional and segment-specific premix solutions: a broad network of around 60 premix plants allows DSM to offer tailor-made, localized customer-driven solutions.
ANH - Active over the full value chain
€2.7bn* sales diversified across species, geographies, and channels

Feed value chain

Sales related to ingredient (%)
- Fat soluble vitamins
- Water soluble vitamins
- Carotenoids
- Enzymes
- Minerals
- Other blending ingredients

Sales by species (%)
- Aqua
- Pet
- Swine
- Poultry
- Ruminant

Sales by region (%)
- Europe
- North America
- Latin America
- Asia (excl China)
- China
- Rest of World

*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
About 25% of ANH sales is supplied directly as **Ingredients** (formulations) to compound feed producers, large farmers, and other premixers.

About 65% of ANH sales is sold as **Premix Solutions** to compound feed producers and large farms. Another 10% is supplied as premix solution, directly to mid-sized farms (Brazil and China).
AN&H | Market & customers

DSM is a leader in the less volatile and higher margin business of Premix Solutions

Value Chain

Agricultural Commodities (soy, corn, etc.)
€140bn

Nutritional ingredients & Formulation
>€10bn

Premix Solutions

Compound Feed
€200bn

Farmers/Processors
>€1,200bn
ANH - Global **Nutritional Ingredients** market

**Total Nutritional Ingredient Market**

- Market Growth ~3-4%
- €12bn market (2018)

- Amino Acids/Other: 4-5%
- Minerals: 4%
- Eubiotics: 5%
- Carotenoids: 2-3%
- Enzymes: 2-3%
- Water soluble vitamins: 4-5%

**DSM ANH Sales (2018)**

- €2.7bn¹ Sales (2018)
- Fat soluble vitamins: 70%
- Carotenoids: 10%
- Enzymes & Eubiotics: 10%
- Minerals: 5%

¹2018 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
Market

ANH – **Global Animal Protein Market** (Meat & fish) by species

**Total global Animal Protein production (volume)**
Global Market growing 2-3% (avg 2016-2018)

1. Source 2018 FAO: Meat/Aquaculture production
2. 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

**DSM ANH Sales to species**
DSM Growth ~5%

- Aquaculture
- Poultry
- Swine
- Ruminants
- Pet
Market

ANH - Market by region
*Global diversification serves as a defense for regional market shocks*

**Global Animal Protein production by region**
Global Market growing 2-3% (avg 2016-2018)

- **China**: 3-4%
- **RoW**: 2-3%
- **Latin America**: 2-3%
- **North America**: 1-2%
- **Asia (excl. China)**: 3-4%

**DSM ANH Sales by region**
DSM Growth ~5%

- **Europe**: €2.7bn¹
- **North America**: Sales (2018)
- **RoW**:
- **Latin America**:
- **Asia (excl. China)**:

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¹2018 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
AN&H | Global animal Protein production & DSM’s sales by species & region

Global Animal Protein Production 2018¹
(million of tonnes)

DSM ANH Sales¹ (€m)

¹Source: FAO 2018 & DSM estimates
ANH | business above-market growth
€2.7bn* sales (2018)

Sales (€ million)

12018 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
Continue to grow the business above market

- Strengthen the core: our position in **premixes solutions** and **species**

- Further build specialty business model with **solutions capability** and **data management**

- Sustaining growth through **Marketing & Sales excellence and Customer Centricity & Agility** (acCElerate program)

- **Radical innovation** for core sustainability topics (e.g. Veramaris, Bovaer, Baliancius™, nitrogen reduction)

- **Further invest** in go-to-market capabilities including Direct-to-Farmer sales

**Target mid single digit ~5% organic CAGR**
ANH | Focused on sustainable animal nutrition
Contribution to higher yields, better animal health & welfare and reduction of eco-footprint

- We work at species and country level to make tangible, measurable impacts
- We scale our solutions to enable transformational change
Leveraging DSM’s unique business model – basis for market-outperformance

Outgrowing the market through premix, sustainability, innovation and Direct-to-Farm

**Market growth (CFE1)**

- **2-3%** Poultry
- **1-2%** Swine
- **0-1%** Ruminants
- **5-6%** Aqua
- **4-5%** Pet

**∑ around 2-3%**

**Animal Nutrition & Health growth enhanced by**

- **Professionalization**
  - Improve Productivity/Feed Conversion & Environmental footprint
- **Antibiotic Resistance & Gastrointestinal Functionality**
- **Need to address Overfishing**
  - “More with less”
  - “Reduce Antibiotic Growth Promoters”
  - “Improve fish-in fish-out ratio”
  - “Reduce emissions”

**Premix**

**Eubiotics**

**Algae Omega-3**

**Innovation**

**∑ around 5% organic sales growth ambition**

1. CFE: Complete Feed Equivalent
DSM’s Veramaris® is a joint venture with Evonik

It is using new algae-based technology, producing EPA & DHA Omega-3 for fish feed

Replacing fish oil from wild caught fish, conserves natural biodiversity of our oceans
AN&H | Veramaris
Omega-3 from fermentation

- Marine algae-derived oil rich in EPA and DHA fatty acids, essential for human and animal health (brain + heart), with a concentration exceeding 50%
- Addresses the decline in omega-3 levels in salmon (fish oil), help sustainable farming
- Large range of applications: early life nutrition, animal (incl. pet, shrimp & fish)

- Sugar and algal strains – GMO-free - are used in the fermentation process
- Fermentation bypasses the food chain providing a highly-concentrated, stable and reliable supply of algal oil that can attain 15% of the current market demand for the salmon industry
- Similar to fish oil, but exempt from its price fluctuations & free from seawe. of contaminants

- One ton of algal oil conserves 60 tons of wild-caught fish, reducing the pressure on over-fishing and enabling the aquaculture industry to grow sustainably
- A waste-free production process

- JV combines DSM bio-tech & Evonik operational knowledge of large-scale manufacturing for fermentative amino acids. Plant in Blair (Nebraska) opened in Jul’19.
- Production expected to ramp up in 2020/2021; estimated €175-200m sales at full operation
- Salmon enriched with Veramaris’ Omega 3 already available to DE, FR & UK retailers via Norwegian commercial partner
A waste-free fermentation process

1. Sugar is fed to the algal strain seeding the fermentation in Blair (Nebraska, US); both GMO-free
2. The algae multiply exponentially and convert sugar into omega-3
3. Centrifugation separates oil from water, resulting in a highly concentrated oil & a liquid co-product
4. The co-product can be used for cattle feed or converted into bio-gas for energy production
5. The algal oil, rich in EPA and DHA fatty acids is a natural, stable product with a concentration >50%
Ruminants contribute significantly to the world’s methane emissions

- In a cow’s stomach, microbes help food break down. This releases hydrogen and carbon dioxide. An enzyme combines these gases to form methane. Bovaer® is a feed additive that suppresses the enzyme, so less methane gets generated.

- Like carbon dioxide (CO2), methane is a greenhouse gas. Its warming effect is shorter lived, but much more potent than CO2. So eliminating it begins to pay off right away.

Bovaer® - (Clean Cow) inhibits methane production by ~30%

Feeding Bovaer® to 1 cow saves the equivalent of 127,000 smartphone charges

Feeding Bovaer® to 3 cows is like taking 1 family-sized car off the road

Feeding Bovaer® to 1 million cows is like planting a forest of 45 million trees
AN&H | Bovaer® - Farm wise & climate friendly

**Significant reduction of methane emissions from cattle**

- Feed additive that blocks enzyme responsible for the methane emissions in cows (↓ 30%)
- Safe, doesn’t leave traces in milk, stable, its effect stops as soon as the additive is not fed
- Increases cow productivity by freeing-up energy from the digestive process: 1 cow generates 3 tons of CO2 equivalent every year in the form of enteric methane

- The molecule in the inhibitor, 3-NOP hampers an enzyme responsible for the methane production in the rumen: A quarter of teaspoon powder per cow a day is needed
- The additive will break down into compounds already naturally present in the stomach

- Ruminants (mainly cows) emit about 20% of all methane gasses globally. Reducing global methane emissions from cows will thus result in immediate impact and therewith help slow the pace of global warming in the next decade already, to facilitate society taking longer-term action on CO2 reduction. Bovaer® could therefore significantly contribute to various UN Sustainable Development Goals, including Climate Action.

- Data collection completed, 26 studies published. Bovaer® has recently been filed for registration in Europe where it will be available as soon as market authorization is granted with a launch in the region anticipated in late 2020/early 2021. Registrations of the feed additive in other regions will follow
- Commercialization will follow the registration phase: estimated market of €1-2bn
- Further expansion in beef market with different forms
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.
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
**Broader Portfolio of Nutritional Ingredients**

**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.
Broader 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 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.

**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.

**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 a 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
Human Nutrition & Health (HNH) | value chain

Food ingredients market

Nutritional Ingredients €40bn
- Vitamins
- Enzymes
- Antioxidants
- Hydrocolloids
- Yeasts
- Cultures
- Carotenoids
- Lipids
- Probiotics

F&B manufacturers €2,130bn
- Nestlé
- Danone
- PepsiCo
- Kraft
- Heineken
- Unilever
- Mars
- General Mills

Dietary suppl. companies €39bn
- Pfizer
- GNC
- Merck
- NBTY
- Amway
- Novartis
- i-Health

Retail brands €2,740bn
- Nestlé
- Danone
- PepsiCo
- Diageo

Store brands €315bn
- Carrefour
- Sainsbury's
- Héctor
- Costco
- Tesco
- Walmart
- Kaufland

Early life/medical €60bn
- Mead Johnson
- Nestlé
- Fresenius
- Abbott

Food service €2,430bn
- McDonald's
- Burger King
- Applebees
- Pizza Hut
- Subway
- Taco Bell

Commodities €660bn
- Dairy
- Fruits
- Cereals
- Proteins
- Meat/fish
- Oils
- Spices, Flour
- Salt
- Sugar

Consumers: >€5,245bn (excl. unprocessed foods)

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

55% of HNH Sales
Nutritional Ingredients

30% of HNH Sales
Nutritional Solutions incl. (customized) premix

15% of HNH Sales
B2C - i-Health
Food producers

Retail / end consumer

HNH Sales related to products (%)

€2.0bn Sales (2018)

- Fat-soluble vitamins
- Water-soluble vitamins
- Carotenoids
- PUFAs
- Enzymes, Nutraceuticals
- Other incl. premix margin

HNH Sales by business segment (%)

€2.0bn Sales (2018)

- Dietary Supplements incl. i-Health
- Food & Beverages
- Early Life Nutrition
- Medical Nutrition / Pharma

* 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 & Application

- Dietary Supplements
- Early Life Nutrition
- Food & Beverages
- Medical Nutrition - Pharma

Region

- EMEA
- North America
- Latin America
- Asia (excl China)
- Asia - Australia

€2.0bn Sales (2018)

Page 79
HNH business continued above-market growth

€2.0bn sales (2018)

Sales (€ million)

<table>
<thead>
<tr>
<th>Year</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales (€ million)</td>
<td>1500</td>
<td>1800</td>
<td>2000</td>
<td>2200</td>
</tr>
</tbody>
</table>

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

Σ around 2-3%

### Human Nutrition & Health growth enhanced by

<table>
<thead>
<tr>
<th>Macro-economic</th>
<th>Health &amp; wellness</th>
<th>Value Chain Shifts</th>
<th>Sustainability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Growing population: new customers</td>
<td>“Less of” strategy: Less fat, less salt, less sugar</td>
<td>Small/new local brands on the rise</td>
<td>Natural/non-artificial</td>
</tr>
<tr>
<td>Ageing Population</td>
<td>Gut-Health &amp; Microbiome</td>
<td>Big Brands need customized Products</td>
<td>Manufacturing: • Sustainability • Fermentation</td>
</tr>
<tr>
<td>Rising Health care costs</td>
<td>Active Nutrition</td>
<td>Personalized Nutrition</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Personalized Nutrition</td>
<td>Digitalization/E-commerce</td>
<td></td>
</tr>
</tbody>
</table>

Σ 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*

<table>
<thead>
<tr>
<th>B2B</th>
<th>B2C</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ingredients</strong></td>
<td><strong>Applications</strong></td>
</tr>
<tr>
<td>Food ingredients</td>
<td>Application platforms</td>
</tr>
<tr>
<td>Stevia</td>
<td></td>
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<tr>
<td>Gut health</td>
<td></td>
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<tr>
<td>Plant-based Protein</td>
<td></td>
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<tr>
<td>Formulations &amp; Delivery systems</td>
<td></td>
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<tr>
<td><strong>Dietary supplements</strong></td>
<td><strong>B2C / i-Health expansion beyond US</strong></td>
</tr>
<tr>
<td>Personalized Nutrition</td>
<td></td>
</tr>
</tbody>
</table>

- Organic
- Organic/ inorganic

**Build out Food Ingredient Solutions business**

**Broaden portfolio & delivery systems**

**Expand & personalize B2C business**
Key innovations

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.
### Key innovations

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

**Focus now on global expansion**

<table>
<thead>
<tr>
<th>Culturelle Adult Chewables</th>
<th>Culturelle Digestive Health Ex. Strength</th>
<th>Culturelle Pro-Well</th>
<th>Culturelle Kids</th>
</tr>
</thead>
<tbody>
<tr>
<td>New form expands consumer base</td>
<td>Growth from committed loyal consumer base</td>
<td>Expands probiotic benefits to heart health with Omega-3s</td>
<td>Expands Kids line with new benefits</td>
</tr>
</tbody>
</table>

- 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...)

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

Affordable nutrition products to overcome malnutrition

Embedding sustainability in our production site

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

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.
Food Specialties
Safe harbor statement

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Food Specialties

We believe food should be healthier, tastier, and more sustainable

- DSM Food Specialties is a leading global supplier of food enzymes, cultures, bio-preservation, hydrocolloids, taste and health ingredients as well as agents as catalyst for biochemical process
- DSM helps make existing diets healthier and more sustainable, giving increasing numbers of people access to affordable, quality food – ‘enabling better food for everyone’ - driven by:
  - Health & Wellbeing - Sugar, salt, fat reduction without compromise on taste & mouthfeel
  - Taste Experience & Indulgence
  - Understandable & Clean Labels - Strong consumer demand for ‘kitchen cabinet’ ingredients, removal of undesired chemicals, clean and clear labels
  - Production Efficiency & Sustainability - Rapidly growing world population, food production more than 8 times more efficient since 1940
  - Shelf Life Extension & Food Waste Reduction
- Customer proximity and the ability to deliver highly tailored products are the basis for our continuously expanding portfolio of innovative fermentation-based product solutions
Food specialties - Innovation powered by leadership in biotechnology

Food Specialties – Global R&D support
We support your innovation & production process — wherever you are based

- North America
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  Las Vegas, NV 89148
  USA
  Tel +1 702 879 2222

- Europe, Middle East & Africa
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  Colombia
  Tel +57 1 477 3676

First-class in finding, making and applying microbial and enzymatic solutions

1.2 patents per million € R&D (industry standard: 0.6)

150 years experience in fermentation technology combining expertise in yeasts, cultures and enzymes

Biotechnological Sciences

Analytical Sciences

R&D and Innovation capabilities dedicated to Food and Beverage industry

Global external & internal network of biotech specialists
Working with DSM is working with a food industry pioneer ......

Today’s technology & expertise goes 150 years back to 1869

**YEAST**
*Nederlandsche Gist- en Spiritusfabriek* founded to develop baker’s yeast

1869

**NATAMYCIN**
DSM scientists discover natural antifungal in South African soil that enabled our bio-preservation solutions

1940s

**PENICILLIN**
DSM scientists discover method to produce antibiotics by fermentation

1950s

**LACTASE**
First company to commercialize lactase enzyme for lactose-free dairy

1964

**CHYMOSIN**
First company to produce a coagulant by fermentation using recombinant DNA technology

1980

**REB-M**
Enabling further sugar reduction through fermentation-based sweeteners

2000

2020
... expertise to help food manufacturers innovate

- DSM’s application experts have already developed thousands of innovations and reformulations and can help its customers get to market quick, with the products consumers will love.

- Whether process efficiency, innovation, added health benefits, taste & texture solutions or extending shelf life? DSM’s application experts will work with its customers to find the right solution for their needs.

- Working with customers on innovation projects is what we do best, where ever you are based, with our global science & innovation and regional food application centers at our customer’s service!

- There is no discipline better placed to enhance quality of life and respond to society’s great challenges than biotechnology. With DSM’s advanced technology and know-how, DSM can create solutions relevant to population growth, resource constraints, food security, climate change and energy concerns – and doing it in a sustainable way, creating brighter lives for people today and generations to come.
Products and Solutions

Product Portfolio food ingredients
*Broadest portfolio in application based formulations*

**Enzymes & Cultures**
- *Enzymes and cultures* enhance taste, texture or act as processing aids functioning as a catalyst for biochemical reactions

**Savory – Yeast extracts**
- *Savory taste solutions* – Extracts and process *flavors* to enhance taste while reducing salt in snacks, ready-meals, sauces, soups and meat

**Bio-preservation**
- *Biopreservatives* – are solutions to naturally extend shelf life of food

**Textures**
- *Hydrocolloids* - are thickeners and stabilizers that dissolve, disperse or swell in water to provide a broad range of critical functionalities and physical attributes, including gelling, texture, mouthfeel, viscosity, suspension and emulsification
Food Specialties addressing 4 key markets

**Dairy** - DSM can help shape your dairy with our cultures, enzymes, cheese ripening & (bio)preservation solutions and residual antibiotic milk tests to produce cheese, fermented milk products and (lactose-free) milk.

**Baking** - DSM offers baking enzymes, preservation systems and ingredient solutions for baked goods with less salt, acrylamide, additives and emulsifiers and gluten-free bread. DSM has deeply invested in research to help improve your baking.

**Beverage** - DSM offers specialty enzymes, taste modulation and bio preservation ingredients for beverage producers.

**Flavors/Savory** - DSM produces savory taste solutions for a wide range of applications such as soups and bouillons, noodles, snacks and sauces, ready meals, meat and meat analogues. DSM's portfolio offers savory ingredients and solutions that are natural, kosher and halal certified.
Food Specialties: Enabling better food for everyone

€0.5bn* sales (2018) diversified across applications, geographies, channel and a complete portfolio

2018 Food Specialties Sales* related to ingredient (%)

2018 Food Specialties Sales* by application landscape (%)

2018 Food Specialties Sales* by region (%)

2018 reported sales of €0.5bn was excluding 2018 Andre Pectin; in the graphs per ingredient, application and region, the proforma Andre Pectin sales has been included.
Food Specialties | value chain

- Enzymes
- Antioxidants
- Hydrocolloids
- Colors
- Cultures
- Flavors
- Textures

F&B manufacturers €2,130bn

Retail brands €2,740bn
- Nestlé
- Danone
- PepsiCo
- Diageo
- Kraft Heinz
- Unilever
- Tyson
- Heineken

Store brands €315bn
- Carrefour
- Safeway
- Walmart
- Tesco
- Aldi
- Costco
- General Mills

Food service €2,430bn
- McDonald’s
- Applebees
- Pizza Hut
- Taco Bell

Commodities €800bn
- Dairy
- Fruits
- Cereals
- Proteins
- Meat/fish
- Oils
- Spices
- Flour
- Salt
- Sugar

Playing a pivotal role in the value chain offering healthier solutions that enhance taste and texture

Total specialty food ingredients market, excluding ~€25bn of commodity ingredients, e.g., soy proteins
Food Specialties sales development: 2018 sales €0.55bn* (incl. Andre Pectin proforma)
Andre Pectin deconsolidated in 2018 but re-consolidated in 2019

Sales (€ million)

<table>
<thead>
<tr>
<th>Year</th>
<th>Sales (€ million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td></td>
</tr>
<tr>
<td>2016</td>
<td></td>
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<tr>
<td>2017</td>
<td></td>
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<tr>
<td>2018</td>
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</tr>
</tbody>
</table>

 Andre Pectin (textures) sales, re-consolidated again, as from 2019
Key food consumer & industry trends, driving above-market growth

<table>
<thead>
<tr>
<th>Market Growth</th>
<th>DSM Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Savory</td>
<td>3-4%</td>
</tr>
<tr>
<td>Enzymes &amp; Cultures</td>
<td>5-6%</td>
</tr>
<tr>
<td>Hydrocolloids</td>
<td>3-4%</td>
</tr>
<tr>
<td>Bio-preservation</td>
<td>4%</td>
</tr>
<tr>
<td>Non-artificial Sweeteners</td>
<td>&gt;10%</td>
</tr>
<tr>
<td>Total</td>
<td>~4%</td>
</tr>
</tbody>
</table>

Create value through market-driven innovation and focus on high growth segments:

- Health & Wellbeing Sugar-Salt-Fat reduction
- Taste Experience & Indulgence
- Production Efficiency & Sustainability
- Shelf Life Extension & Food Waste Reduction
- Understandable & Clean Labels

Driving above market growth
Sustainable sweeteners through fermentation – Avansya

*EverSweet™ - the 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.
Solutions for delicious yogurts

- DSM offers perfect taste and texture solutions for stirred, drinkable or set yogurts, plain or with flavor, with or without probiotics, lactose-free, low-in fat, high in protein or sugar-reduced

- **Delvo®Fresh**, high quality cultures for indulgent fermented milk products
- **Delvo®Pro**, high quality and cost-effective probiotic strains
- **Maxilact®**, leading lactase enzymes for lactose-free and sugar-reduced dairy
- **Delvo®Guard**, protective cultures to extend shelf life
PreventASe®

Preventing acrylamide formation with PreventASe®

- PreventASe® helps snack and cookie producers comply with and stay ahead of acrylamide regulation
- PreventASe® prevents the formation of unhealthy acrylamide levels in baked goods

- In the final application, it reduces acrylamide levels by up to 95% with no impact on taste or texture
Meat analogues toolbox: Create a delicious meat taste without meat

- Our easy to use toolbox contains all the right savory ingredients to create a delicious meat taste
- From taste enhancement and specific taste directions to salt reduction with uncompromised taste

The products in our toolbox

- Maxavor® YE
- Maxavor® YE Key
- Maxagusto
- Maxarome Pure/Select
- Gistex

The global meat analogue market has a value of US$2 billion and grows with >4% per year
Safe harbor statement

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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.
Personal Care & Aroma Ingredients provides innovative solutions for sun, skin and hair care as well as for the fragrance and flavour industry. These solutions are used by many of the world’s best-known consumer brands (€382m in sales in 2018)

- DSM’s extensive portfolio of key ingredients includes peptides, natural bio-actives, UV filters, hair polymers, vitamins and (specialty) aroma ingredients (such as lavenders & ionones)
  - The product portfolio is complemented by a unique range of services in the areas of formulation, sensory, technical, quality and regulatory expertise

- The business is driven by global megatrends, local consumer beauty regime insights, and growth opportunities presented by emerging markets
Personal Care & Aroma Ingredients

Key Products

Delivering the power of UV Protection. Crafted by our bright science, the PARSOL® portfolio offers the world’s broadest range of high performing UV filters, and a globally recognized expertise on which our customers can build their brands.

As well as being pioneers in the organic beauty market, DSM offers a wide-ranging portfolio of 55 natural ingredients certified at various levels from Organic to ISO 16128. This House of Naturals originates from edible vegetables, herbs, oils, milk, silk or marine algae. Some are extracted from natural botanical sources while others are produced sustainably using biotechnology.

DSM’s QUALI® vitamins help provide skin protection, lightening and other cosmetic benefits. DSM is leading an exciting revolution in vitamins. Bringing the power of vitamins to health and beauty and showing the incredible difference that quality vitamins can make to people’s skin and hair.

Our dedicated AMPHISOL® portfolio offers a bedrock of emulsifiers for maximum formulation versatility in sun and skin care. We pay careful attention to the emulsifier and emulsion stability, enabling our customers to harness the power of robust emulsification to create creams with superior sensorial qualities.

SYN®-Peptides offer specific skin benefits based on substantiated efficacy. The range is proven to be highly effective in the fight against ageing and our in-depth knowledge of peptide processing technology ensures quality and flexibility over the whole production process - providing tailored peptides for visible, targeted effects.
Personal Care & Aroma Ingredients

Key Products

DSM’s pioneering ALPAFLOR® portfolio offers a full range of high performing bioactives extracted from rare alpine plants that are cultivated organically in a pristine environment high in the Alps. Every step of our supply chain is traceable and is an excellent example of sustainability and fair trade in action.

VALVANCE® is DSM’s answer to consumer and customer demand for immediate, strongly perceived effects and for desirable formulations that couple cosmetic elegance with extra comfort. Specially designed with DSM’s customary expertise to deliver on people’s everyday beauty aspirations in skin care and sun care.

Our 50-plus years of expertise in polymer technologies is dedicated to designing tailored, high quality TILAMAR® products that deliver outstanding hair care and styling benefits to help our customers stand out in their markets.

The agility of DSM, our people’s expertise in skin biology and our advanced synthetic peptide and extraction technologies enable us to deliver in the targeted benefit areas and set new standards for improved skin appearance and ultimate skin sensation.

Our bright science helps fragrance houses to continue innovating and producing products of the highest purity and quality that put a smile on consumers’ faces. Targeted molecules include products already known to the industry, brand new molecules, or equally important intermediates, which support the industry’s drive for success.
Products & Solutions

Personal Care & Aroma Ingredients

Key markets

Sun Care

DSM’s PARSOL® portfolio offers the world’s broadest range of high performing UV filters, and a globally recognized expertise on which DSM’s customers can build their brands. DSM selects and combines UV filters in the most effective formulation, to deliver the required UV protection.

Hair Care

DSM’s hair care formulations can be used in a variety of market application to create market leading products. DSM’s hair care formulations include polymers alongside UV filters, skin bioactives and vitamins. Ingredients can be combined to create hybrid formulations that style, protect and provide care, so consumers get a product that fits in with their individual lifestyle and need.

Skin Care

With 40 years of experience in skin care, DSM has developed a broad portfolio of claim substantiated skin actives – including our pioneering SYN®-Peptides, the unique, certified organic ALPAFLOR® line of alpine plant extracts with scientifically proven cosmetic efficacy, and vitamins from DSM’s comprehensive portfolio optimized for cosmetic applications.

Aroma ingredients

Our bright science helps fragrance houses to continue innovating and producing products of the highest purity and quality. DSM constantly looks to expand its portfolio and develop innovative new products for the Fragrance customers. DSM’s advanced chemical and biotechnological expertise, in combination with a unique technology and production infrastructure, are the cornerstones of DSM Aroma Ingredients Innovation capability.
Personal care ingredients market 2018

(x) = Growth rate 2018-2021 (CAGR, %)

Active ingredients (3-6%)
- UV-filters, vitamins, skin care actives (natural extracts, synthetic peptides)

Performance ingredients (3-4%)
- Hair conditioning & styling polymers, skin sensory modifiers & enhancers, pigments & dyes

Technical ingredients (2-3%)
- (Co) emulsifiers, thickeners & rheology control agents, emollients, solubilizers, etc.

Surfactants (0-1%)
- Fatty alcohols, FA sulphates/ ethoxylates/ ethersulphates, betaines, amphoacetates, etc.
Aroma ingredients market 2018

- DSM’s aroma ingredients portfolio consists of lavenders and ionones that are sold to the world’s leading fragrance and flavor companies.
- These products find their use mainly in home and personal care products, fine fragrances as well as in the food industry.
- Market growth for lavenders and ionones is expected to be around 3-4% per year in 2018-2021 period.
- DSM product range includes:
  - Ionones
    - Alpha-Ionone
    - Beta-Ionone
    - Methyl-Ionone
  - Lavender
    - Linelool
    - Linalyl Acetate
    - Tetrahydrolinalool

Overview of the aroma ingredients market (2018)

- €5bn
- Synthetic
- Essential oil/natural
- €1.5bn

Terpenes
Benzoids
Musk
Lavender & Ionones
Citrus
Pinene
Menthol
Terpenes

F&F ingredients
Personal Care & Aroma Ingredients

Value chain Personal Care

Selected Specialty Ingredients segments

Active and UV Ingredients (€1.5bn)

Performance Ingredients (€2.5bn)

Technical Ingredients (€3.5bn)

Surfactants (€5bn)

Base Chemicals (€15bn)

Cosmetic brand companies and Private Label Value: €240bn

Fast Moving Consumer Goods Value: €380bn

Leading position in selected key ingredients for cosmetic companies
Personal Care & Aroma Ingredients
Sales overview

2018 Personal Care ingredients Market by segment (%)
- Surfactants: 0-1%
- Active ingredients: 3-6%
- Performance ingredients: 3-4%
- Technical Ingredients: 2-3%

Market Growth 2-3%

DSM PC&A Sales by segment (%)
- Aroma Ingredients (2018): 37%
- Sun: 24%
- Skin: 26%
- Hair: 5%
- Others: 8%

DSM Growth ~5%

DSM PC&A Sales by region (%)
- Europe
- China
- Asia-Pacific
- Latin America
- North America

~€0.4bn (2018)
Personal Care & Aroma Ingredients
€0.4bn sales (2018)

Sales (€ million)

<table>
<thead>
<tr>
<th>Year</th>
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<tbody>
<tr>
<td>2015</td>
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<td>2017</td>
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<td>2018</td>
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8% CAGR organic growth 2016-2018
Sustainability GEMS

**PRODUCTS**

**Quali®-E vitamin**
The lowest carbon footprint.

**ALPAFLOR®**
Organic and fair trade farming, green chemistry, traceability from seed to bioactive, certified.

**PENTAVITIN®**
100% renewable, low carbon footprint, 100% natural origin, certified.

**Panthenol**
CEFIC award for production process: energy efficiency, reduced emissions, reduced and reused waste.

**PROGRAMS AND TOOLS**

**Quali®-E footprint calculator**

**The House of Naturals**

**Skin Cancer Prevention initiative**

**DSM SUNSCREEN OPTIMIZER™**

*DSM Personal Care & Aroma Ingredients, Sustainability, 2019*
Personal Care & Aroma Ingredients
Continuous innovation – TILAMAR® Boost 150

TILAMAR® Boost 150

Achieving the ultimate volume is one of THE top trends in hair care – and one of the TOP desired benefits by consumers. But, it’s one of the most complicated to achieve, especially together with care properties! Based on 50 years of expertise in materials science, we have identified, out of 500 trials, a unique hyperbranched polymer offering both incredible volume and care properties with its unique mode of action.
Key innovations

Personal Care & Aroma Ingredients

Continuous innovation – PARSOL® ZX

PARSOL® ZX

When it comes to sun care, consumers are familiar with mineral UV-filters, such as Zinc Oxide. This is interesting because we know that high familiarity often correlates with high levels of trust. With PARSOL® ZX Zinc Oxide grade, DSM has combined high SPF protection, excellent UVA performance and blue light protection in one mineral UV-filter.
Personal Care & Aroma Ingredients
Continuous innovation – PEPHA®-AGE

PEPHA®-AGE
STIMULATES SKIN’S OWN DEFENSE AGAINST BLUE LIGHT

✓ Proven efficacy against blue light induced skin hyperpigmentation (-30%) and irritation (-25%)
✓ Prevents the skin premature aging by reducing ROS level (-35%) and carbonylated proteins (-60%)
✓ Protects the fibroblasts viability and boosts the collagen synthesis (+34%)

Skin benefits:
✓ Reduces skin damage caused by sun light
✓ Offers even skin tone
✓ Minimizes the appearance of ageing after exposure to blue light and UV

PEPHA®-AGE
Many consumers have started to make the link between blue light and potential harm to skin, but there is still a need for more information and scientific evidence. Specialized in the development and manufacturing of active ingredients of natural origin, pioneering researchers at DSM have already identified potential in the sustainable freshwater alga Scenedesmus rubescens, a unique cell with developed self-defense capabilities. In the form of the bioactive PEPHA®-AGE, the algae has been shown to stimulate skin’s own defense against the negative impact of blue light and UV radiation. Now, to prove its efficacy further, DSM has carried out two new studies.
Personal Care & Aroma Ingredients

Continuous innovation – EPIBIOME BEAUTY™

Key innovations

EPIBIOME BEAUTY™

THE NEW LEVEL OF SKIN WELL-BEING!

- EPIBIOME™ BEAUTY combines our expertise in CORNEOCARE®, which builds a strong epidermal barrier, with the skin microbiome.
- For the first time in a clinical study, DSM scientists demonstrated the seen and unseen: the complex relationship between normal, dry or oily skin, and its microbiome.
- In total, more than 200 different bacteria species were identified - predominantly
  - CUTIBACTERIUM ACNES - an important gatekeeper that influences sebum production.
  - STAPHYLOCOCCUS EPIDERMIDIS - a keystone for healthy skin.
  - CORYNEBACTERIUM KROPPENSTEDTII - a novel target for the control of skin redness

EPIBIOME BEAUTY™

DSM is a key player in microbiome gut health solutions. We offer a wide range of products within the probiotic, prebiotic, and enzyme sectors. We are also recognized industry leaders in epidermal science, especially in relation to the skin barrier – the home of the skin’s microbiota. By combining our expertise and knowledge in microbiology and epidermal science, we can create new innovative skin microbiome solutions.
Sustainability drives our growth
Safe harbor statement

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Materials

A high-quality specialties portfolio focused on well-defined, higher-growth specialty segments

- The Materials cluster comprises DSM Engineering Plastics, DSM Resins & Functional Materials and DSM Dyneema
- The cluster consists of a high-quality portfolio of specialty materials serving global automotive, electrical & electronics, building & construction, consumer goods, flexible food-packaging, high-performance textiles and life protection industries
- Key trend is substitution; customers are looking to replace existing parts and materials with newer, more sustainable alternatives
- DSM has been future-proofing the Materials business by focusing on higher-growth and higher-margin applications in Sustainable Living. DSM is a leading provider of sustainable innovations, meeting demands for greater efficiency, safer materials and improved environmental performance
End-market segments offer growth options enhanced by substitution based on application development

- DSM Engineering Plastics
- DSM Dyneema
- DSM Resins & Functional Mat.
- DSM Biomedical
- DSM Advanced Surfaces
- Automotive
- Electronics
- Life Protection
- Fiber Solutions
- Sustainable Coatings
- Functional Materials
- Regenerative Biomaterials
- Solar

Replace metals & hazardous materials
Replace steel/aluminum & aramids
Environmentally friendly solutions
Replace traditional solutions
Fossil fuel replacement

Growth via end-markets and substitution based on application development
Materials

Sales (2018) overview by end-market and geography

Sales by end-market (%)

- Building & Construction: 17%
- Automotive & Transport: 23%
- Electrics & Electronics: 15%
- Food Packaging: 18%
- Other: 27%

Total: €2.9bn (2018)

Sales by Geography (%)

- Europe: 21%
- China: 23%
- North America: 21%
- Asia: 15%
- Rest of the World: 18%

Total: €2.9bn (2018)

Key financial data

Sales (€ million)

<table>
<thead>
<tr>
<th>Year</th>
<th>Sales (€ million)</th>
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<tbody>
<tr>
<td>2015</td>
<td>2500</td>
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<tr>
<td>2016</td>
<td>2500</td>
</tr>
<tr>
<td>2017</td>
<td>3000</td>
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<tr>
<td>2018</td>
<td>3000</td>
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% organic growth

CAGR organic growth 2016-2018: 6%
## Materials

### Key financial data

<table>
<thead>
<tr>
<th>Sales (€m) &amp; sales volume growth (%)</th>
<th>Adj. EBITDA (€m) &amp; Adj. EBITDA margin (%)</th>
<th>Adj. EBIT (€m) &amp; Adj. EBIT margin (%)</th>
<th>Capital Employed (€m)</th>
<th>Capital Expenditure (€m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015: 2,528, -4%</td>
<td>2015: 384, 15.2%</td>
<td>2015: 250, 9.9%</td>
<td>2015: 1723</td>
<td>98</td>
</tr>
<tr>
<td>2016: 2,513, -1%</td>
<td>2016: 435, 17.3%</td>
<td>2016: 311, 12.4%</td>
<td>2016: 1,807</td>
<td>106</td>
</tr>
<tr>
<td>2017: 2,825, 7%</td>
<td>2017: 488, 17.3%</td>
<td>2017: 361, 12.8%</td>
<td>2017: 1,786</td>
<td>124</td>
</tr>
<tr>
<td>2018: 2,913, 5%</td>
<td>2018: 512, 17.6%</td>
<td>2018: 383, 13.2%</td>
<td>2018: 1,878</td>
<td>132</td>
</tr>
</tbody>
</table>

- **ROCE (%)**
  - 2015: 14.4%
  - 2016: 17.6%
  - 2017: 20.0%
  - 2018: 20.6%

- **Capital Expenditure (€m)**
  - 2015: 98
  - 2016: 106
  - 2017: 124
  - 2018: 132
Purpose drives new growth opportunities in Materials

Addressing Focus Domains ...

... provides growth platforms ...

... that are propelled by our current growth drivers ...

... and have strong fit with DSM’s competences
Improved Health & Living drives new opportunities

Improved Health & Living

- Global aging population
- Active lifestyle & wellness
- Consumer demand for sustainable solutions
- Healthcare costs

New applications and innovative materials needed:

- Need for safer, less invasive medical procedures that are also more cost-effective
- Consumer-driven demand to more sustainable, safer, longer-lasting, higher performing and healthier materials solutions

DSM ideally positioned to benefit from this trend:

- Biomedical materials and devices business addressing unmet health needs
- 3D-Additive Manufacturing for medical application
- Sustainable & safer solvent-free resins for wall paints
Green products & applications drive move towards bio-based resources

- Circular/ sharing economy
- Consumer demand for sustainable solutions
- Regulatory pressure (Governments/NGOs)
- Bio-based Biotechnology

Increased substitution to bio-based solutions:

- Consumer-driven demand for innovative, sustainable materials with lower footprint
- New circular business models focused on recovery, recycling and sharing

DSM ideally positioned to benefit from this trend:

- Advanced solutions for Solar energy
- Bio-based solutions Green polymers
- Dyneema® slings/ lines make wind farm operations more efficient and reliable
New mobility & connectivity calls for new applications

New mobility & connectivity

- Electrification
- Autonomous driving
- Light-weighting
- Data-integrated value chains

New applications and innovative materials needed:

- Increasing demand for lighter-weight, higher-performance materials that can be used in new form factors:
  - Increased innovation challenge
  - Increased complexity
- Demand for new unforeseen applications including radically new designs

DSM ideally positioned to benefit from this trend:

- Leadership in lightweight high-performance plastics
- Switchgears connectors, lighting, thinnovation
- Fiber-optic materials for high-speed internet connecting the world
Materials Strategy 2021 – Growth & Value
Capturing opportunities in Sustainable Living

High

New Mobility & Connectivity

Functional Materials

Additive/3D

Improved Health & Living

High-Performance Plastics

Biomedical

Solar

Bio-based

Niaga

Dyneema®

Fiber Solutions

Dyneema®

Personal Protection

Specialty Coating

Specialty Compounds

PA6 HV

Film & extrusion

Dyeing & Coating Resins

Green

Products & Applications

Strategic ambitions
- Above-market volume growth
- Adj. EBITDA margin 18-20%
- High single-digit % annual Adjusted EBITDA growth

Enhanced by programs
- Global customer centricity
- Commercialization of large innovation programs
Strategy

Commercialization of large innovation programs in Materials

- **New biomedical products**
  - Tissue repair
  - Ophthalmology

- **Advanced solar materials**
  - Coatings/ Backsheets

- **3D Printing – Additives**
  - New world manufacturing

- **Niaga®**
  - Redesign for full circular

- **eBOOST**
  - Enzymes/Yeasts
  - 1.5-2G bio-ethanol

- **High performance materials**
  - ForTii®, Stanyl®, Arnitel®
  - Next generation high performance polymers

Programs combined leading to:
- Expected Sales after 2020: ~€250m and expected Adj. EBITDA after 2020: ~€100m
Materials Strategy 2021 – Growth & Value
Future-proofing Materials through focus on Sustainable Living

Growth-driven by winning segments:

- Focus on capturing growth from macro themes & SDGs, well aligned with DSM's strengths in Sustainable Living:
  1. Improved Health & Living
  2. Green Products & Applications
  3. New Mobility & Connectivity

- Substitution, Sustainability & Innovation

Growth enhanced by:

- Commercialization large innovation programs
- Customer centricity and agility programs

Above market volume growth
High single-digit annual Adj. EBITDA growth
Adj. EBITDA margin of 18-20%
Materials

Global presence in R&D and production supporting preferred partnerships in winning segments
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
DSM Engineering Plastics
A global engineering plastics player with a broad range of value-adding polyamides and polyesters

- DSM Engineering Plastics is a global engineering materials player with a broad range of value-adding, high performance polyamides and polyesters (€1,516m in sales in 2018)
- DSM is a world leader in high-performance sustainable thermoplastics used in automotive, electrical & electronics, building & construction, medical, food packaging and consumer goods
- Our materials enable lighter, stronger and more durable products - which in turn makes people’s lives safer, more convenient and healthier – and all while helping to tackle carbon emissions
- We are well positioned as one of the leaders in ‘thinnovation’ - the trend for creating smaller, lighter, greener and safer working parts in electronic devices
DSM Engineering Plastics
A global engineering materials player with a broad range of value-adding polyamides and polyesters

- Broad range of high-quality materials portfolio with value-adding, high performance polyamides, polyesters and polyphenylenesulphide
- Global leadership positions in many of its products, such as Stanyl®, Akulon® PA6 and Arnitel®

Key industries:
- **Automotive**: reduce fuel consumptions & emissions via weight / friction reduction, electrification and connectivity, safety and comfort
- **Electrical & electronics**: improve functionality, miniaturization and process efficiency; address e-waste issue

Work in close collaboration with customers to develop breakthrough innovative solutions:
- Low emission
- Halogen-free
- Eco-efficiency
- Recycle-based
- Bio-based
DSM Engineering Plastics
A broad Advanced Material Solutions Portfolio

DSM is a leading innovator in high-performance materials

Global market leading positions with:
- Stanyl® PA46 in High Temperature Polyamides as PA46, PA4T, PPA
- Arnitel® TPC in Thermoplastic Elastomers
- Akulon® PA6 in Injection and Blow Molding and Flexible Food Packaging Film Extrusion
# DSM Engineering Plastics

**Materials Portfolio**

<table>
<thead>
<tr>
<th>Product</th>
<th>Strengths</th>
<th>Product</th>
<th>Strengths</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stanyl® PA46</td>
<td>▪ Excellent high-temperature mechanical properties</td>
<td>Arnitel® TPC</td>
<td>▪ Range of hardnesses varying from 85 shore A up to 72 shore D.</td>
</tr>
<tr>
<td></td>
<td>▪ Excellent wear and friction behavior</td>
<td></td>
<td>▪ High temperature resistance within the TPE family, up to 170°C.</td>
</tr>
<tr>
<td></td>
<td>▪ Superior melt flow</td>
<td>Arnite® PET PBT</td>
<td>▪ Applicable in high precision components</td>
</tr>
<tr>
<td>ForTii® PA4T PPA</td>
<td>▪ Best mechanics &lt;160°C</td>
<td></td>
<td>▪ Good electrical properties</td>
</tr>
<tr>
<td></td>
<td>▪ Highest peak temperature performance</td>
<td>Akulon® PA6 PA66</td>
<td>▪ True workhorse materials with good balance between mechanical properties and toughness</td>
</tr>
<tr>
<td>EcoPaXX® PA410</td>
<td>▪ High chemical resistance</td>
<td></td>
<td>▪ Easy processability</td>
</tr>
<tr>
<td></td>
<td>▪ 30% lower moisture uptake than PA66 with higher</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>mechanical performance</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ Excellent surface finish</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ 72% bio-based</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Xytron™ PPS</td>
<td>▪ Dimensional stability</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ Heat aging performance up to 240°C</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ Extreme Chemical resistance</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
DSM Engineering Plastics - Applications

Our portfolio of tough yet lightweight materials are driving manufacturers to produce automotive components that are extremely light, reduce engine friction, and can operate in extreme environments – particularly at very high temperatures.

Our broad portfolio of materials cover a broad range of applications, from water management systems to roofing membranes to heating systems and window systems.

Our portfolio of engineering materials are developed with the knowledge that technology and innovation go hand-in-hand. They're used across a broad range of consumer goods, including appliances, furniture, white goods, flexible food packaging, and sporting equipment.

Developing electrical components and products that are compliant with the regulation, are kind to the planet and deliver on all the major trends – from smart electricals to quest for safe ingredients – and all while managing costs as efficiently as possible.

Designers and engineers at the world’s leading electronics brands rely on our expertise and materials to develop next-generation devices. They challenge us to transform their design vision into reality with innovative, advanced plastics for frames and enclosures, connectors, cables, wearable straps, and automotive electronics devices.
Industrial equipment is driven by multitudes of mechanical parts such as gears, bearings, valves. As we continue to develop new and better engineering plastics, we are helping our customers develop mechanical parts that are higher quality, safer, more sustainable, and more cost-efficient.

Our broad portfolio of materials enables manufacturers of medical devices, fabrics and packaging to design for the future, developing new, innovative options that perform better than what was available before.

Our materials meet the high demands needed to set new standards in design, comfort and ease of use, as well as accelerating the quest to drastically cut energy use.

Transportation by truck, train and airplane is essential to running the world. Improving transportation by making it smarter, safer, lighter, and greener is a key focus for the industry and governing bodies. Our high-performance materials, coupled with the knowledge and resources behind them, are helping manufacturers change the way they think about application design.
DSM Engineering Plastics

Value chain driven by application development at leading OEMs and system integrators

High-Performance Materials

Monomer ➔ Polymer ➔ Compound ➔ Convertor ➔ System Supplier ➔ OEM ➔ End User

Science, Expertise & Support

Design
- Review application requirements
- Analyze datasets
- CAE support

Measure Performance
- Temperature
- Mechanical
- Chemical resistance
- UL and other global safety standards

Production Support
- Quality control
- Identify production efficiencies

Compliance
- Documentation
- Data sheets
- Regulatory affairs statements
- Life cycle analysis
**DSM Engineering Plastics**

*Value chain: Developing applications further down the value chain*

<table>
<thead>
<tr>
<th>DSM</th>
<th>Parts producers/molders</th>
<th>System suppliers</th>
<th>OEMs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Polyesters</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>High Performance</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Polyamides</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PA46, PA4T, PA410</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>PPS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>PA66</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>PA6</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Automotive**
  - Quadranti
  - BorgWarner
  - Valeo
  - Mecaplast Group
  - Volkswagen
  - BOSCH
  - Autoliv
  - Audi
  - Toyota
  - Peugeot

- **Electronics & Electrical**
  - TE
  - Foxconn
  - Schneider Electric
  - Legrand
  - ABB
  - Samsung
  - Sony
  - Philips
  - Siemens

- **Consumer Goods**
  - Hahl Pedex
  - John Deere
  - Salomon
  - Yamaha

- **Flexible Food Packaging**
  - Toyota Tsusho
  - Kohler
  - Husqvarna
  - SÜD-Pack
  - Sealed Air
  - Wipak
DSM Engineering Plastics

Sales by region and by end-market

Sales by region (%)

- Asia-Pacific
- China
- Latin America
- North America
- Europe

~€1.5bn (2018)

Sales by end-market (%)

- Automotive
- Electrics & Electronics
- Flexible Food Packaging / other
- Consumer Goods

~€1.5bn (2018)
DSM Engineering Plastics: €1,516m in sales in 2018

Sales overview

<table>
<thead>
<tr>
<th>Year</th>
<th>Sales € million</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>1290</td>
</tr>
<tr>
<td>2016</td>
<td>1300</td>
</tr>
<tr>
<td>2017</td>
<td>1490</td>
</tr>
<tr>
<td>2018</td>
<td>1540</td>
</tr>
</tbody>
</table>

CAGR organic growth 2016-2018: 5%
Two Mega Trends are re-shaping our industry

Sustainability and New Technology

- Resources
- Circularity
- Climate
- Energy

New Technologies

- New Mobility
- Connectivity
- Artificial Intelligence
Industry Mega Trend: New Technology

Rapid shift to New Mobility, Connectivity & Artificial Intelligence ....

- Virtual /Augmented Reality
- Autonomous Car
- Holographic Display
- Internet Cloud
- New Mobility
- Connectivity
- Artificial Intelligence
- Speech Recognition
- 5G Network
- Connected Home
- Edge vs. Cloud Computing

2000 - 2007

Digital 1st

2007 - 2017

Mobile 1st

Since 2017
Industry Mega Trend: New Technology

*Technology shift asks for new and innovative high-performance materials*

- Increasing demand for higher-performance materials that can be used in new form factors
  - Increased innovation challenge
  - Increased complexity
- Demand for new applications including radically new designs (innovation, miniaturization, simplification)
- Demand for functional materials

DSM Engineering Plastics supports with:

- High-performance materials for automotive and E&E components as Connectors, Sensors, Power Distribution
- Strong application and technology support for OEMs and Tiers
- Application-specific CAE simulations for mold flow, mechanics, thermal and EMI shielding characteristics
DSM Engineering Plastics is ideally positioned for growth

**Broad portfolio of high-performance materials**
- Broad range and know-how of high-performance polyamides and polyesters offers solutions for many challenges driving substitution growth
- Broad range differentiator to service increasingly demanding customers

**Strong innovation/ R&D capabilities**
- Close cooperation with customers to develop breakthrough innovative solutions
- Continuous investments in new technologies
  - Multiple platform launches based on ForTii® technology

**Global reach and leadership**
- Global network provides application development capabilities and service for global OEM customers whenever, wherever
  - Increased footprint in emerging economies
  - Very strong presence in China

**Specified application development**
- 75% of business is highly specified by leading global brands (vs. 50% in 2015)
  - Customers as well as resilient income locked in
DSM Engineering Plastics - Strategy
Focus on higher-growth, higher-margin applications

- Maintain above market growth
- Drive higher margin businesses
DSM Engineering Plastics – Strategy

Continue application-driven growth path while continuously improving operational efficiency

**Increased growth**
- Focus on capturing growth from macro themes & UN SDGs, well aligned with DSM’s strengths in Sustainable Living
- Accelerate growth in High Performance Materials
- Grow position in PA6 Compounds
- Maximize value in PA6 Extrusion

**High-Performance Plastics**

**PA6 Compounds**
- Commercialization of innovation
- Customer centricity and agility programs
- Continuous operating efficiency improvements

**PA6 Polymers**
- Focus on highly specified application development for global customers in ‘winning’ segments in new mobility & connectivity

**Enhanced by:**
- Continue to grow by leveraging global presence and footprint
- Fully utilize assets and supply compound needs
DSM Engineering Plastics - On the road to zero emissions

**Strong commitment toward Climate & Energy, Resources & Circularity**

**Sustainable solutions**
- Enabling our customers to design and manufacture sustainable solutions
  - Cleaner and safer cars
  - Safer ingredients in Electronics
  - Food waste reduction

**Bio-based products**
- Castor-oil based
  - EcoPaXX®
  - ForTii® Eco
- Rapeseed-oil Based
  - Arnitel® Eco

**Recycled-based products**
- Fishing nets: recycled-resources based
  - Akulon® RePurposed

**Safer ingredients in our products**
- Halogen-free flame-retardant grades in PA, PBT, HPM
  - PVC or PFC-free alternatives
  - Arnitel XG®
  - Arnitel VT®

**Renewable electricity in our operations**
- 63% purchased renewable electricity
  - Pune (India) operations powered by own solar field
  - Geleen (Netherlands) operations by wind energy
Offering bio- and/or recycled-based alternatives for our entire portfolio by 2030.
DSM Engineering Plastics

Global footprint to support customers across the globe

Production locations
- Tokyo - Japan
- Incheon - South Korea
- Shanghai - China
- Jiangyin - China
- Shenzen - China
- Togliatti - Russia
- Emmen - Netherlands
- Sittard - Netherlands
- Geleen - Netherlands
- Genk - Belgium
- Düsseldorf - Germany
- Detroit - USA
- Evansville - USA
- Silicon Valley - USA
- São Paulo - Brazil
- Tokyo - Japan
- Incheon - South Korea
- Taipei - Taiwan
- Kaohsiung - Taiwan
- Ho Chi Minh City - Vietnam
- São Paulo - Brazil

R&D locations
- Chennai - India
- Pune - India
- Pantnagar - India

Offices
- Geleen - Netherlands
- Sittard - Netherlands
- Genk - Belgium
- Düsseldorf - Germany
- Emmen - Netherlands
- Togliatti - Russia
- Shanghai - China
- Jiangyin - China
- Shenzen - China
- Düsseldorf - Germany
- Emmen - Netherlands
- Togliatti - Russia
- Shanghai - China
- Jiangyin - China
- Shenzen - China
- Detroit - USA
- Evansville - USA
- Silicon Valley - USA
- São Paulo - Brazil
- Kai - Brazil
- Pantnagar - India
- Chennai - India
- Pune - India
- Ho Chi Minh City - Vietnam
- São Paulo - Brazil
- Kai - Brazil
- Pantnagar - India
- Chennai - India
- Pune - India
- Ho Chi Minh City - Vietnam

DSM Engineering Plastics

- Production locations
- R&D locations
- Offices
BRIGHT SCIENCE. BRIGHTER LIVING.™
Sustainability drives our growth
Safe harbor statement

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Resins & Functional Materials
A global specialty coating producer with an unmatched technology portfolio

- DSM Resins & Functional Materials is a global leader of sustainable, plant-based, waterborne coating and powder coating resins that are used in a wide range of applications, while its UV-curable fiber-optic coatings are recognized worldwide as the standard for fiber protection and identification (€1,053m sales in 2018)

- DSM is leading the trend to shift from traditional solvent-based coatings that contain hazardous materials to the use of more sustainable coating technologies such as waterborne and plant-based

- Expanding the field of properties to enlarge the range of applications in which waterborne, powder and UV coatings can be used remains key
# Resins & Functional Materials

*Business lines overview sustainable coating resins*

<table>
<thead>
<tr>
<th>Powder Coating Resins</th>
<th>Specialty Coating Resins</th>
<th>Functional Materials (Energy Curable Solutions)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Powder</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very sustainable technology for Industrial Coating</td>
<td>High performance low/ no VOC coatings and packaging</td>
<td></td>
</tr>
<tr>
<td><strong>Waterborne</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>UV Solutions</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Performance UV materials for a/o telecom applications</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Resins & Functional Materials
Sustainable Coating Resins - Products & Solutions

What's in the toolbox?
- Solid Acrylates
- Waterborne
- Solventborne
- Powder
- Plant-based
- UV

Markets & Applications
- Furniture
- Packaging
- Building & Construction
- Industrial General
- Telecom – 5G
- Consumer Goods
- Vehicle

Making a material difference

<table>
<thead>
<tr>
<th>Material</th>
<th>Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wood</td>
<td>Coating resins that bring out the beauty of natural and engineered wood</td>
</tr>
<tr>
<td>Metal</td>
<td>High-performance coating systems that look great and stop corrosion</td>
</tr>
<tr>
<td>Paper</td>
<td>Making plain board and paper as pretty as a picture</td>
</tr>
<tr>
<td>Leather &amp; Textiles</td>
<td>VOC-free waterborne coatings and breathable coatings perfect for</td>
</tr>
<tr>
<td></td>
<td>outdoor wear, come rain or shine</td>
</tr>
<tr>
<td>Concrete &amp; Asphalt</td>
<td>Road markings, anti-graffiti coatings and concrete garage floor</td>
</tr>
<tr>
<td></td>
<td>coatings</td>
</tr>
</tbody>
</table>
Resins & Functional Materials

Sustainable Coating Resins - Products & Solutions

Our resin technology for solid acrylics is used in both coatings and inks for high-speed packaging lines. Our technical team at DSM has excellent particle size control in acrylics, with an intimate knowledge of how to control the chemistry and processes.

Despite society’s clear need to move toward more sustainable coating technologies, the reality is that there’s still a place for solventborne systems in the coating industry – for example in ink resins for flexible food packaging, where only solventborne technologies are currently capable of meeting the necessary drying requirements.

Plant-based paint existed long before DSM – in fact, it’s been around for 17,000 years. In more recent times, we’ve seen a move from solventborne to waterborne resin and coating technology. But now, a new plant-based revolution is being ushered in by our bright minds at DSM.

Waterborne resin technology has gained real momentum in the coatings industry, and we’re proud to have been there from the start. Waterborne coatings contain around eight times fewer VOCs than traditional solventborne equivalents.
Resins & Functional Materials

Sustainable Coating Resins - Products & Solutions

We invented powder coating technology over 60 years ago. For years, our resin technology toolbox has enabled metal and other man-made substrates to be cured faster and more efficiently, at lower temperatures and with less waste – all while delivering outstanding durability and aesthetics across a wide range of market segments.

Our growing technology toolbox for UV and energy curable resins is based on our conviction that this technology has the potential to revolutionize the coatings industry. In addition to their instantaneous drying times and zero volatile organic compounds (VOC) content, our UV resins are delivering outstanding performance across a range of markets – from boosting adhesion in labels and foils for food packaging to increasing the efficiency and safety of paper and board printing, to providing a viable alternative to traditional urethane in the growing flex flooring sector and connecting the world via fast internet, coated by our energy curable solutions.
Resins & Functional Materials

Value chain

Solvent-based resins

Powder resins

Water-based resins

UV curing resins

Resins - ~€30bn

Arkema

Allnex

Impression of end market

IKEA

HP

GM

CORNING

Ideally positioned as the industry continues to move to more sustainable coatings
Resins & Functional Materials markets by technology & DSM’s position

€130bn global paints & coatings market, €30bn global resins market (2018)

Market by Technology

- Solvent: ~€30bn (2018)
- Waterborne
- Plant
- UV
- Powder

Market Growth 3-4%

Growth

DSM Sales by Technology

- Energy Curing
- Powder
- Specialty Resins (water)
- Other

DSM Growth above market

Decline (2-3%)
Resins & Functional Materials – DSM’s position
Sustainable Coating Resins - Products & Solutions

DSM Sales by Markets

- Others
- Furniture
- General & consumer goods
- Packaging
- Telecom
- Building & Construction
- Vehicle

~€1,1bn

DSM Sales by Geography

- North America
- Europe
- Rest of Asia Pacific
- RoW

~€1,1bn
Resins & Functional Materials – Sales development

Sales (€ million)

<table>
<thead>
<tr>
<th>Year</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value</td>
<td>800</td>
<td>900</td>
<td>1000</td>
<td>1100</td>
</tr>
</tbody>
</table>

7% CAGR organic growth 2016-2018
Resins & Functional Materials - Strategy

Well-positioned in the Materials portfolio, focusing on higher-value, more sustainable specialty products.
Resins & Functional Materials - Strategy

Improving growth and earnings by focusing on sustainable solutions

Increased growth
- Accelerated Growth in Functional Materials
- Grow in Specialty Coating Resins
- Maximize Returns in Powder Coating Resins

Efficiency Capital discipline
- Commercial excellence
- Cost and efficiency improvements
- Prudent growth-focused capex
- Working capital discipline

Functional Materials (Energy Curable Solutions)
- Grow customer base facilitating Fiber-to-Home trend
- Transfer 4G-5G
- Innovation platform

Specialty Coating Resins
- Drive substitution of Solvent-based
- New innovations focusing on sustainability

Powder Coating Resins
- Drive substitution of Solvent-based
- Leverage asset base and optimize
Resins & Functional Materials – Continuous sustainable Innovations

Niaga® is outsmarting complex combinations of toxic and non-recyclable intermediates in everyday stuff. Niaga® share a non-negotiable product design philosophy, to make products healthier and fully recyclable.

Decovery® plant-based resins are based on a novel process of converting renewable materials. Free of Volatile Organic Compounds, it has an extremely low odor and offers many additional benefits to the end-products.

Transforming the Chinese sea freight container industry. To mobilize industry support for the switch from solventborne to waterborne coatings in China, DSM founded the Waterborne China Platform in 2010. In 2016, the Chinese container industry decided to sign a convention to introduce waterborne coatings.

DeSolite® Supercoatings is the industry leading coating solution for fiber protection worldwide. Helping assure signal reliability and protecting fibers from harsh environmental conditions.
Resins & Functional Materials
Driving Sustainability In Decorative Coatings

A strong demand for cleaner paint

- Regulators, professional painters and consumers are increasingly sensitive to the health hazards of solventborne paints, and there is a strong demand throughout the value chain for cleaner and more sustainable decorative paint solutions.

- DSM Resins & Functional Materials is driving the coatings industry by delivering innovative coating resins that outperform market alternatives and enable higher levels of sustainability and help to reduce climate change.
Resins & Functional Materials
*Niaga: Redesigning everyday products from scratch*

- **Niaga® Technology:** a 100% recyclable carpet, produced with up to 90% less energy.

  ![Niaga Logo](image)

  *alive. again and again.*

- Technology is for instance also applicable for production of fully recyclable green mattresses (Auping’s “Bedzzzy”) or circular panels in furniture (ECOR)
Resins & Functional Materials

*Desolite – Fiber-optic coatings*

- Without fiber-optic cable there is no fast internet connecting the world. And without UV-curable coatings, there is no fiber-optic cable
- DSM is the world’s leading supplier of fiber-optic coatings, which help assure signal reliability and protect fibers from harsh environmental conditions
- DeSolite® Supercoatings made by DSM is the industry leading coating solution for fiber protection worldwide
Resins & Functional Materials
Tackling volatile organic compounds (VOC) emissions

Solventborne coatings: a significant source of VOC emissions
- 95% of the world’s sea freight containers are made in China, almost all are painted with solventborne coatings

Potential market: ~165,000 tons of waterborne coatings a year
- (if all new containers were painted with waterborne coatings, i.e. 60-70kg of paint per container)

- In 2010, DSM founded the Waterborne China Platform to mobilize industry support for the switch to waterborne coatings in China:
- Since 2014, the Chinese government has been focused on environmental protection, including introducing more stringent regulations on VOC emissions from solvent-based coatings
- In 2016, the Chinese container industry decided to sign a convention to introduce waterborne coatings (Guangdong Province switched in 2016, followed by the rest of the country in 2017)
- DSM has recorded considerable growth in its business with paint & coatings customers such as Valspar/Sherwin Williams
- Further growth driven by other industries and governing bodies changes:
  - The Chinese furniture industry is switching to waterborne coatings
  - The Shenzhen Municipality has forbidden the use of solventborne coatings for external wall applications

-2.5mm 20ft containers (2015)
130,000 VOC emissions (China)
-20,000 containers waterborne coatings

Page 178
Discovery® plant-based resins are based on a novel process of converting renewable materials.

- Free of Volatile Organic Compounds, Discovery® has an extremely low odor and offers many additional benefits to the end-products.
- Praxis, one of the largest Dutch hardware chains, was looking for a sustainable solution for its premium range of private label decorative paints.
- In close cooperation with DSM, Praxis was able to further improve quality and sustainability using Discovery®.
- In 2016, DSM and ICA Group together announced a new water-based coatings line for interiors called IRIDEA BIO.
Resins & Functional Materials
Leading the way in environmental friendly materials

Changing the value chain actively with lower carbon footprint products
Lower emissions (GHG, VOC)
Zero Land field

Creating demand for lower carbon footprint products

Reducing the use of solventborne paints where possible
Phase-out all Chemicals of High Concern from our finished products

Exploring in bio-based/renewable value chains
Step-up sourcing of bio-based recycled raw materials
Safe harbor statement

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Dyneema®
The world’s strongest fiber™

- Dyneema®, the world's strongest fiber™, is respected as the premium brand for Ultra-High Molecular Weight Polyethylene (UHMwPE) fibers and fabrics. We manufacture and sell products in several forms.

- The business is driven by the need for lightweight, sustainable solutions that offer extreme durability coupled with improved safety and ergonomics.
  - DSM’s global product leadership is based on unique, IP-protected technology platforms.
  - 15 times stronger than steel, 40% stronger than aramid, and floats on water.
  - Dyneema® products typically replace traditional materials such as steel and aramid.
### Technologies and Form Factors
- Polymer
  - Uni-Directional Sheets
  - Fiber
  - Fabrics & Laminates

### Key Markets
- **Overview**
  - **Industry:** Defense & Law Enforcement
    - **Applications:** Ballistic Vests, Inserts, Helmets, Vehicle protection
    - **Value Proposition:** Lightest weight protection and increased comfort
  - **Industry:** Maritime, Offshore, Aquaculture, Industrial
    - **Applications:** Ropes, cables, slings, nets, fishing and yachting lines
    - **Value Proposition:** Lower operation cost and footprint and increased worker’s safety
  - **Industry:** Automotive, Manufacturing, Food
    - **Applications:** Cut resistant gloves, Protective workwear
    - **Value Proposition:** Better cut protection at higher comfort level
  - **Industry:** Sports & Lifestyle, Industrial
    - **Applications:** Outdoor equipment, Footwear, Apparel and denim, inflatables
    - **Value Proposition:** Ultra-lightweight, increased performance
Dyneema®
*Key market segments and applications*

**Maritime**
Mooring and tow ropes made with Dyneema® SK78 are helping the Maritime industry to achieve new levels of safety, efficiency and reliability. Lighter, more durable, easier to handle and with limited rope backlash

**Heavy Lifting**
On- and offshore construction workers and crane operators can lift greater loads further, higher and more quickly with Dyneema® offering them stronger, safer and more efficient equipment that is always up to the task

**Personal Protection**
Our market-leading technologies are developed with ballistic protection manufacturers to enable next-generation armor solutions across a wide range of fields in vehicle and personal armor

**Commercial Fishing**
Ropes and nets made with Dyneema® enable more sustainable fishing techniques that optimize catch and production, save money, and are sustainable
Dyneema®
Key market segments and applications

- **Sports & Lifestyle**: Ultralight strength. These exceptional properties have made Dyneema® fiber and fabrics, indispensable for the outdoor, sports and fashion industries, offering innovation without compromising on style or performance.

- **Offshore**: Rope, sling and synthetic link chain technologies made with Dyneema® are helping the Offshore industry to work efficiently.

- **Renewable Energy**: Strong, lightweight, ‘Greenest Strength’ Dyneema® can help developers cut the cost of renewable energy today, and enable the innovative renewable technology we will need going forward.

- **Mining**: Employing high-strength, lightweight synthetic ropes made with Dyneema® is one of the fastest ways to increase productivity, increase safety, and reduce operating costs in today’s competitive mining industry.
As the world’s strongest fiber™, Dyneema® is uniquely positioned when continuous high performance is of utmost importance.
Dyneema® - Global Market & Dyneema® Sales

Global High-performance fiber market (%)
- LCP and other 1%
- Other UHMwPE 23%
- Dyneema® UHMwPE 27%
- p-aramid 49%

~€1.2bn (2018)

Market Growth 2-3%

DSM Sales by application (%)
- Other
- Personal Protection
- Fiber Solutions

€344m (2018)

DSM Sales by Geography (%)
- APAC
- Latin America
- North America
- EMEA

€344m (2018)
Dyneema® - €344m sales (2018)

Sales Overview

Sales (€ million)

- 2015
- 2016
- 2017
- 2018

8% CAGR organic growth 2016-2018
Dyneema®
Solid growth strategy well anchored
Dyneema®

Dyneema focuses on current premium portfolio while selectively adding new sustainable, innovative products and solutions.

- Increased growth:
  - Accelerated growth in Fiber Solutions and Personal Protection
  - Investments to increase global UHMwPE production capacity
  - Partnerships for renewable energy solutions

- Cost and capital discipline:
  - Continuous cost and efficiency improvement focus
  - Working capital discipline

- Fiber Solutions:
  - Focus on development of new sustainable applications
  - New products/solutions in existing segments
  - ... with strong patent protection

- Personal Protection:
  - Continue re-focus on growing Personal Protection segment
Dyneema® Composite Fabrics are made from multiple oriented fiber and resin layers that dramatically increase the performance against tear, puncture and abrasion, while cutting weight and reducing bulk.

Dyneema® Force Multiplier Technology fuses breakthrough polymer science, next generation fiber technology and unique uni-directional engineering for maximum ballistic protection in a lightweight solution, enhancing comfort and mobility.

Better lashing Synthetic link chains with Dyneema® are eight times stronger than comparable steel chains, and more than 85% lighter. They are soft, quiet, easy to handle and don’t whip back should they break.

Sustainable clean energy Dyneema® is ideal for applications in renewable energy technology and sustainable transport. Dyneema® is being used to build the next generation of wind turbines and will be used to harness the potential of tidal and wave energy.
Sustainability

Dyneema®
Protecting people and the environment they live in. Because all life is precious.

3 ways we make Dyneema® greener

- **CLEANER MANUFACTURING**
  Reducing the energy, water consumption and switching to renewable energy

- **INNOVATING PERFORMANCE**
  Constantly improving to achieve higher performance specs with less material

- **INDUSTRY COLLABORATION**
  Investments & initiatives that lead towards a circular economy

Dyneema® outperforms all competing alternatives

- Today, products and solutions with Dyneema® protect 30 million people per year
- Approximately 75% of DSM Dyneema’s fiber production is based on renewable electricity, which saves CO₂ emissions equivalent to nearly 13,000 vehicles off the road for one year
- Dyneema® delivers the lowest carbon footprint per unit of strength because less material is used to achieve a given strength performance
BRIGHT SCIENCE. BRIGHTER LIVING.™
Safe harbor statement

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- 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.
Accelerating & supporting innovation

Innovation at DSM is fostered at business group level, but also through a separate Innovation Center

The Innovation center has two main objectives:

1. Enable and accelerate innovation power and speed in core businesses as a center of excellence.
   - Protect DSM’s intellectual property
   - Focus on adjacent technologies and business opportunities for growth through DSM’s Corporate Research Program and Venturing & Licensing activities

2. Focus on areas outside the current scope of the business groups, investing in new and innovative growth options through the DSM Business Incubator and by developing and extracting value from the company’s Emerging Business Areas (‘EBAs’) in promising end-markets that provide strong long-term growth platforms which are based on the company’s core competences in health, nutrition and materials
## Emerging Business Areas

### Long-term growth

<table>
<thead>
<tr>
<th>Biomedical</th>
<th>Bio-based products &amp; services</th>
<th>Advanced solar</th>
</tr>
</thead>
<tbody>
<tr>
<td>▪ Partner with the medical industry worldwide to develop innovative biomaterials and regenerative medical devices that improve patients’ lives</td>
<td>▪ Pioneer advances in <strong>biomass conversion</strong> and seek to demonstrate the commercial viability of sustainable, renewable technologies in collaboration with strategic partners in the value chain (e.g. POET in cellulosic 2nd generation bio-ethanol)</td>
<td>▪ Aim to accelerate the uptake of photo voltaic energy by focusing on the development and commercialization of technologies and materials that increase the efficiency of solar modules, reducing the cost of energy delivered</td>
</tr>
<tr>
<td>▪ Develop innovative materials, components and full medical devices based on biomedical polyurethane and polyethylene, resorbable polymers, ceramics, collagens, extracellular matrices, silicone hydrogels, device coatings, and drug delivery platforms</td>
<td>▪ Leverage the expertise and products DSM has built up in enzymes and yeasts for bio-fuels to create new businesses and make the production of all generations of bio-fuels more efficient and sustainable</td>
<td>▪ Strong position as a multi platform solution provider for high-performance solar PV materials, driven by market-leading anti-reflective coatings, co-extruded conventional backsheet technology with a superior cost performance ratio and an innovative new type of backsheet fueling electroconductive solar module architecture</td>
</tr>
<tr>
<td>▪ Aim to outpace market growth in high-growth segments of the medical device market including cardiology, neurology, ophthalmics, diabetic care, and orthopedics</td>
<td>▪ License technology and expertise, enabling future partners to convert biomass in a commercially viable and sustainable way</td>
<td></td>
</tr>
</tbody>
</table>
# Innovation

**Large programs supporting growth**

- **Bovaer/Clean Cow**: feed additive that reduces methane emissions from ruminants by ~30%
- **Veramaris**: natural marine algal oil rich in omega-3 (high concentration of both DHA and EPA)
- **Balancius**: feed ingredient that promotes gut health & drives antibiotics reduction
- **Avansya**: fermentative stevia that drives sugar reduction/replacement in F&B

- **Niaga**: process technology & material science enabling healthy & recyclable carpets, mattresses and furniture
- **Advanced solar**: coatings & backsheets
- **New Biomedical**: tissue repair / ophthalmology
- **Bioethanol**: enzymes / yeasts for 1.5-2G

**Expected Sales/Adj. EBITDA** in 2021 and 2025 of large projects: ~€350m/€100m rising to ~€1bn/€0.4bn

Total innovation sales (at higher margins) remain at 20% of sales
Key innovations

Veramaris
Omega-3 from fermentation

- Marine algae-derived oil rich in EPA and DHA fatty acids, essential for human and animal health (brain + heart), with a concentration exceeding 50%
- Addresses the decline in omega-3 levels in salmon (fish oil), help sustainable farming
- Large range of applications: early life nutrition, animal (incl. pet, shrimp & fish)

- Sugar and algal strains – GMO-free - are used in the fermentation process
- Fermentation bypasses the food chain providing a highly-concentrated, stable and reliable supply of algal oil that can attain 15% of the current market demand for the salmon industry
- Similar to fish oil, but exempt from its price fluctuations & free from seaworne contaminants

- One ton of algal oil conserves 60 tons of wild-caught fish, reducing the pressure on over-fishing and enabling the aquaculture industry to grow sustainably
- A waste-free production process

- JV combines DSM bio-tech & Evonik operational knowledge of large-scale manufacturing for fermentative amino acids. Plant in Blair (Nebraska) opened in Jul’19.
- Production expected to ramp up in 2020/2021; estimated €175-200m sales at full operation
- Salmon enriched with Veramaris’ Omega 3 already available to DE, FR & UK retailers via Norwegian commercial partner
**Veramaris**

**How does it work?**

**A waste-free fermentation process**

1. **Fermentation production**
   - Sugar is fed to the algal strain seeding the fermentation in Blair (Nebraska, US); both GMO-free.

2. **Downstream processing**
   - The algae multiply exponentially and convert sugar into omega-3.

3. **Centrifugation separates oil from water, resulting in a highly concentrated oil & a liquid co-product.**

4. **The co-product can be used for cattle feed or converted into bio-gas for energy production.**

5. **Our algal oil**
   - The algal oil, rich in EPA and DHA fatty acids is a natural, stable product with a concentration >50%.
Bovaer® - One burp at a time
How cows can help us fight climate change

Ruminants contribute significantly to the world’s methane emissions

- In a cow’s stomach, microbes help food break down. This releases hydrogen and carbon dioxide. An enzyme combines these gases to form methane. Bovaer® is a feed additive that suppresses the enzyme, so less methane gets generated.

- Like carbon dioxide (CO2), methane is a greenhouse gas. Its warming effect is shorter lived, but much more potent than CO2. So eliminating it begins to pay off right away.

Bovaer® - (Clean Cow) inhibits methane production by ~30%

Feeding Bovaer® to 1 cow saves the equivalent of 127,000 smartphone charges

Feeding Bovaer® to 3 cows is like taking 1 family-sized car off the road

Feeding Bovaer® to 1 million cows is like planting a forest of 45 million trees
Bovaer® - Farm wise & climate friendly
Significant reduction of methane emissions from cattle

- Feed additive that blocks enzyme responsible for the methane emissions in cows (↓ 30%)
- Safe, doesn’t leave traces in milk, stable, its effect stops as soon as the additive is not fed
- Increases cow productivity by freeing-up energy from the digestive process: 1 cow generates 3 tons of CO2e every year in the form of enteric methane

- The molecule in the inhibitor, 3-NOP hampers an enzyme responsible for the methane production in the rumen: A quarter of teaspoon powder per cow a day is needed
- The additive will break down into compounds already naturally present in the stomach

- Ruminants (mainly cows) emit about 20% of all methane gasses globally. Reducing global methane emissions from cows will thus result in immediate impact and therewith help slow the pace of global warming in the next decade already, to facilitate society taking longer-term action on CO2 reduction. Bovaer® could therefore significantly contribute to various UN Sustainable Development Goals, including Climate Action.

- Data collection completed, 26 studies published. Bovaer® has recently been filed for registration in Europe where it will be available as soon as market authorization is granted with a launch in the region anticipated in late 2020/early 2021. Registrations of the feed additive in other regions will follow
- Commercialization will follow the registration phase: estimated market of €1-2b
- Further expansion in beef market with different forms

Page 204
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.
Key innovations

Avansya
Fermented sweetness

- Sustainable, high quality stevia sweetener branded as EverSweet™
- Best taste profile and mouthfeel compared to current solutions in the market
- 200x sweeter than sugar and zero calories with taste that closely resembles sugar
- Large range of applications: soft drinks, cereals, confectionery, dairy, baking, etc.

- Fermentative stevia sweetener provides a more scalable, sustainable and lower cost-in-use solution than any other available technology

- Addresses the issue of sugar overconsumption and responds to shifts in consumers’ preference to non-artificial products
- More sustainable production compared to fully plant-based alternatives
- Stevia products will not accumulate in the environment

- 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
Key innovations

Balancius™
Improving gut health

- Alliance with Novozymes since 1998

- Balancius™: feed enzyme improving gut health, enabling removal of antibiotics from animal feed
Balancius™
Improving gut health

- A NATURAL PRODUCT
  - Broiler feed ingredient that breaks down the dead bacterial cells debris in the gut responsible for nutrients malabsorption in the bloodstream, reduced diet's digestibility & feed efficiency
  - Dust free, mixable and thermostable
  - Supports digestion, gastrointestinal functionality and improves animal performance
  - Addresses the issue of antibiotic use in animal farming

- BIO-TECH DRIVEN
  - The enzyme (muramidase) targets and hydrolyzes bacterial cell debris (peptoglycans) along the whole gastrointestinal tract
  - The addition of Balancius to the diet of broiler chickens consistently improves feed conversion ratio, demonstrating a significant improvement in digestibility and feed efficiency.

- SUSTAINABLE
  - Growing population drives global demand for healthy, affordable poultry meat that puts additional pressure on natural resources
  - Balancius reduces the environmental footprint of poultry production: GHG emissions as well as enabling removal of antibiotics from animal feed

- READINESS & POTENTIAL
  - Balancius is the latest innovation from the Alliance of DSM with Novozymes, reflecting the strength of its scientific capabilities and ongoing leadership in animal nutrition and health.
  - Product is registered and available in North America, LatAM and Europe for poultry markets
  - Swine market solutions available next
Key innovations

CanolaPRO™
Providing enough protein for 500 million people

- CanolaPRO™: Turning inedible byproduct of rapeseed oil into: highly nutritious neutral-tasting protein ingredient for food & beverages

- Reducing the footprint of our food consumption
CanolaPRO™
Proteins from rapeseed oil

- Plant-based protein with high-nutritional value, balanced taste profile, highly soluble & great emulsification functionality, sustainable
- Non-GMO, non-gluten, non-dairy and hypo-allergenic
- Diverse applications: beverages, protein bars, bakery, meat analogs, cereals

- New technology that turns an inedible agricultural byproduct of rapeseed oil extraction into valuable plant protein for a wide range of uses in food
- It takes rapeseed meal (byproduct of the cooking oil extraction process) normally fed to animals and makes it edible by isolating the protein from the meal

- Addressing the issues of feeding an increasing world’s population, fight protein deficiency and shifts in dietary preferences
- Low-carbon footprint
- Repurpose by-product of rapeseed extraction

- DSM-Avril collaboration announced in Jul’19
- Industrial production facility fully dedicated to be established at Avril’s Dieppe site
- Commercial availability as early as 2021
Key innovations

Hello Niaga®. Goodbye waste.  
Redesigning everyday products from scratch

- Niaga® Technology: a 100% recyclable carpet, produced with up to 90% less energy

niaga®
alive. again and again.

- Design for recycling of mattresses
- Circular furniture panels
Niaga®
Recyclable products

- Redesign: reconsider everyday things to make them healthier for people and planet
- Philosophy: keep it simple, clean materials only, use reversible connections
- Idea: design products so all materials can be brought back to life, again and again
- Transparency: radical openness to materials, suppliers, manufacturing and teammates

- Process technology to bind fibers and laminate materials to each other
- Reversible “click-unclick” adhesive portfolio to enable material separation
- Novel solutions for product use, reuse, refurbishment and recycling

- Carpet is one of the big contributors to landfill waste today, due to complex combinations of materials glued together. Niaga® found ways to meet all performance demands of a carpet using only one material. This allows for easy recycling after use, back into carpet
- Transparency is a key value, and you can always know what is inside a Niaga® product design

- Showcase production line for carpets operational in Geleen (NL), supplying EU manufacturers
- In NA, Mohawk’s Air.O carpet and Empire’s HomeFresh carpet utilize Niaga® technology
- Partnerships with Auping (mattresses) and ECOR (furniture panels) extend the Niaga® design philosophy to other industries
Advanced Solar
More power from same sun

- DSM has developed coating technologies that boost (5-10%) the power generated by solar PV systems and make solar more competitive
  - ✔ Our Anti-Reflective coating for solar glass squeezes out an all-important 3% power gain compared to non-treated equivalents
  - ✔ Our Anti-Soiling feature is specifically for solar parks in dry, desert climates where sand and dirt is blown onto the solar panels.
  - ✔ Our 100% recyclable backsheets for solar panels to boost power gain even further - while reducing carbon footprint by 30% compared to conventional backsheets.
Safe harbor statement

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## Financial Data

### Income statement

<table>
<thead>
<tr>
<th></th>
<th>2018</th>
<th>2017</th>
<th>2016</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Net Sales underlying business</strong>(^1)</td>
<td>8,852</td>
<td>8,632</td>
<td>7,920</td>
<td>7,722</td>
</tr>
<tr>
<td><strong>Adjusted EBITDA underlying business</strong>(^1)</td>
<td>1,532</td>
<td>1,445</td>
<td>1,262</td>
<td>1,075</td>
</tr>
<tr>
<td><strong>EBITDA</strong></td>
<td>1,754</td>
<td>1,348</td>
<td>1,146</td>
<td>1,046</td>
</tr>
<tr>
<td><strong>Adjusted operating profit (EBIT) underlying business</strong>(^1)</td>
<td>1,055</td>
<td>957</td>
<td>791</td>
<td>573</td>
</tr>
<tr>
<td>Operating profit (EBIT)</td>
<td>1,245</td>
<td>846</td>
<td>657</td>
<td>304</td>
</tr>
<tr>
<td>Financial income tax expense</td>
<td>(101)</td>
<td>(104)</td>
<td>(133)</td>
<td>(174)</td>
</tr>
<tr>
<td>Income tax expense</td>
<td>(194)</td>
<td>(115)</td>
<td>(89)</td>
<td>(68)</td>
</tr>
<tr>
<td>Share of profit of associates and joint ventures</td>
<td>129</td>
<td>1,154</td>
<td>194</td>
<td>30</td>
</tr>
<tr>
<td><strong>Profit for the year</strong></td>
<td>1,079</td>
<td>1,781</td>
<td>629</td>
<td>92</td>
</tr>
<tr>
<td>Profit attributable to non-controlling interest</td>
<td>2</td>
<td>12</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td><strong>Net profit attributable to equity holders of DSM</strong></td>
<td>1,077</td>
<td>1,769</td>
<td>621</td>
<td>88</td>
</tr>
<tr>
<td>Dividend on cumulative preference shares</td>
<td>(8)</td>
<td>(8)</td>
<td>(4)</td>
<td>(10)</td>
</tr>
<tr>
<td><strong>Net profit available to holders of ordinary shares</strong></td>
<td>1,069</td>
<td>1,761</td>
<td>617</td>
<td>78</td>
</tr>
</tbody>
</table>

\(^1\) Continuing operations, excluding temporary vitamin effect 2018
### Financial Data

#### Other key figures

<table>
<thead>
<tr>
<th></th>
<th>Total DSM</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2018</td>
</tr>
<tr>
<td><strong>Cash provided by operating activities underlying business</strong>(^1)</td>
<td>1,126</td>
</tr>
<tr>
<td><strong>Capital Employed</strong></td>
<td>8,181</td>
</tr>
<tr>
<td><strong>Capital Expenditure:</strong></td>
<td></td>
</tr>
<tr>
<td>Intangible assets and PP&amp;E</td>
<td>653</td>
</tr>
<tr>
<td>Acquisitions</td>
<td>51</td>
</tr>
<tr>
<td>Disposals</td>
<td>257</td>
</tr>
<tr>
<td>Depreciation, amortization and impairments</td>
<td>509</td>
</tr>
<tr>
<td><strong>Net debt</strong></td>
<td>(113)</td>
</tr>
<tr>
<td><strong>Dividend</strong></td>
<td>412</td>
</tr>
<tr>
<td>Workforce at 31 December, headcount (#)</td>
<td>20,977</td>
</tr>
<tr>
<td>Employee benefit costs</td>
<td>1,753</td>
</tr>
</tbody>
</table>

\(^1\) Excluding temporary vitamin effect 2018
## Financial Data

### Ratios

<table>
<thead>
<tr>
<th></th>
<th>Total DSM</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2018</td>
</tr>
<tr>
<td><strong>ROCE (%) underlying business</strong></td>
<td>13.3</td>
</tr>
<tr>
<td><strong>Net sales underlying business / average capital employed</strong></td>
<td>1.11</td>
</tr>
<tr>
<td><strong>Current assets / current liabilities</strong></td>
<td>2.45</td>
</tr>
<tr>
<td><strong>Equity / total assets</strong></td>
<td>0.57</td>
</tr>
<tr>
<td><strong>Gearing (net debt / equity plus net debt)</strong></td>
<td>0.01</td>
</tr>
<tr>
<td><strong>Adjusted EBIT underlying business / net sales in % underlying business</strong></td>
<td>11.9</td>
</tr>
<tr>
<td><strong>Net profit / avg. shareholder’ equity available to holders of ordinary shares (%)</strong></td>
<td>24.7</td>
</tr>
<tr>
<td><strong>Adjusted EBITDA underlying business / financial income and expense</strong></td>
<td>15.2</td>
</tr>
</tbody>
</table>

1 Continuing operations, excluding temporary vitamin effect 2018
## Financial Data

### Balance sheet – Assets

<table>
<thead>
<tr>
<th></th>
<th>Total DSM in € million</th>
<th>2018</th>
<th>2017</th>
<th>2016</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intangible assets</strong></td>
<td></td>
<td>3,090</td>
<td>3,058</td>
<td>3,188</td>
<td>3,228</td>
</tr>
<tr>
<td><strong>Property, plant and equipment</strong></td>
<td></td>
<td>3,511</td>
<td>3,313</td>
<td>3,325</td>
<td>3,171</td>
</tr>
<tr>
<td><strong>Deferred tax assets</strong></td>
<td></td>
<td>248</td>
<td>281</td>
<td>355</td>
<td>366</td>
</tr>
<tr>
<td><strong>Share in associates and joint ventures</strong></td>
<td></td>
<td>205</td>
<td>227</td>
<td>586</td>
<td>644</td>
</tr>
<tr>
<td><strong>Financial Derivatives</strong></td>
<td></td>
<td>14</td>
<td>16</td>
<td>-</td>
<td>32</td>
</tr>
<tr>
<td><strong>Other financial assets</strong></td>
<td></td>
<td>263</td>
<td>475</td>
<td>463</td>
<td>419</td>
</tr>
<tr>
<td><strong>Non-current assets</strong></td>
<td></td>
<td><strong>7,331</strong></td>
<td>7,370</td>
<td>7,917</td>
<td>7,860</td>
</tr>
<tr>
<td><strong>Inventories</strong></td>
<td></td>
<td>1,993</td>
<td>1,848</td>
<td>1,800</td>
<td>1,627</td>
</tr>
<tr>
<td><strong>Receivables</strong></td>
<td></td>
<td>1,738</td>
<td>1,690</td>
<td>1,653</td>
<td>1,556</td>
</tr>
<tr>
<td><strong>Financial derivatives</strong></td>
<td></td>
<td>21</td>
<td>41</td>
<td>40</td>
<td>15</td>
</tr>
<tr>
<td><strong>Current investments</strong></td>
<td></td>
<td>1,277</td>
<td>954</td>
<td>944</td>
<td>9</td>
</tr>
<tr>
<td><strong>Cash and cash equivalents</strong></td>
<td></td>
<td>1,281</td>
<td>899</td>
<td>604</td>
<td>665</td>
</tr>
<tr>
<td><strong>Assets held for sale</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>11</td>
</tr>
<tr>
<td><strong>Current assets</strong></td>
<td></td>
<td><strong>6,310</strong></td>
<td>5,432</td>
<td>5,041</td>
<td>3,883</td>
</tr>
<tr>
<td><strong>Total assets</strong></td>
<td></td>
<td><strong>13,641</strong></td>
<td>12,802</td>
<td>12,958</td>
<td>11,743</td>
</tr>
</tbody>
</table>
# Financial Data

**Balance sheet – Equity and liabilities**

<table>
<thead>
<tr>
<th>Total DSM</th>
<th>2018</th>
<th>2017</th>
<th>2016</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shareholders’ Equity</td>
<td>7,782</td>
<td>6,962</td>
<td>6,072</td>
<td>5,541</td>
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<tr>
<td>Non-controlling Interest</td>
<td>33</td>
<td>103</td>
<td>108</td>
<td>90</td>
</tr>
<tr>
<td><strong>Equity</strong></td>
<td>7,815</td>
<td>7,065</td>
<td>6,180</td>
<td>5,631</td>
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<tr>
<td>Deferred tax liabilities</td>
<td>254</td>
<td>259</td>
<td>278</td>
<td>319</td>
</tr>
<tr>
<td>Employee benefit liabilities</td>
<td>413</td>
<td>356</td>
<td>490</td>
<td>496</td>
</tr>
<tr>
<td>Provisions</td>
<td>116</td>
<td>151</td>
<td>128</td>
<td>98</td>
</tr>
<tr>
<td>Borrowings</td>
<td>2,272</td>
<td>2,551</td>
<td>2,552</td>
<td>2,557</td>
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<tr>
<td>Financial derivatives</td>
<td>3</td>
<td>4</td>
<td>14</td>
<td>182</td>
</tr>
<tr>
<td>Other non-current liabilities</td>
<td>197</td>
<td>188</td>
<td>158</td>
<td>228</td>
</tr>
<tr>
<td><strong>Non-current liabilities</strong></td>
<td>3,255</td>
<td>3,509</td>
<td>3,620</td>
<td>3,880</td>
</tr>
<tr>
<td>Employee benefit liabilities</td>
<td>46</td>
<td>39</td>
<td>40</td>
<td>44</td>
</tr>
<tr>
<td>Provisions</td>
<td>37</td>
<td>53</td>
<td>54</td>
<td>41</td>
</tr>
<tr>
<td>Borrowings</td>
<td>380</td>
<td>77</td>
<td>853</td>
<td>253</td>
</tr>
<tr>
<td>Financial derivatives</td>
<td>51</td>
<td>20</td>
<td>239</td>
<td>50</td>
</tr>
<tr>
<td>Current liabilities</td>
<td>2,057</td>
<td>2,039</td>
<td>1,972</td>
<td>1,842</td>
</tr>
<tr>
<td>Other liabilities held for sale</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td><strong>Current liabilities</strong></td>
<td>2,571</td>
<td>2,228</td>
<td>3,158</td>
<td>2,232</td>
</tr>
<tr>
<td><strong>Total equity and liabilities</strong></td>
<td>13,641</td>
<td>12,802</td>
<td>12,958</td>
<td>11,743</td>
</tr>
</tbody>
</table>
Financial Data

Stronger free cash flow & earnings per share

High single-digit annual Adj. EBITDA growth
- Supported by above-market sales growth in all businesses

EBITDA margins improvement
- Nutrition >20%
- Materials 18-20%

Avg. Total working capital reduction
- Reduce to ~16%

Balanced CAPEX
- Discipline & focus; Nutrition & growth (~6.5% of sales)

Tax
- 18-20%

~10% average annual increase of Adj. Net Operating Free Cash Flow

Earnings per share to increase ahead of Adj. EBITDA growth
Financial Data
Cash allocation policy unchanged

1. Disciplined capex for organic growth
   - ~2/3 in Nutrition
   - ~50-60% focused on growth

2. Dividend
   - Stable, preferably rising
   - Payout 40-50% of adj. (underlying) earnings

3. M&A
   - Prudent and disciplined approach
   - Value creation is key

4. Share buy-backs
   - To be considered in the absence of value-creating M&A
   - €1bn SBB started 2019

- Mid-term capital structure: 1.5-2.5x net debt / Adj. EBITDA
- Committed to maintaining a strong investment grade credit rating
Financial Data | Stable, preferably rising dividend policy
Step-up linked to cash generation

- Maintaining dividend policy: stable and preferably rising
- Proposal to increase ordinary dividend with 25% over 2018 to €2.30 per share
  - Reflecting future earnings/cash generation
  - DSM to pay one third of the proposed dividend over 2018 (€0.77 per ordinary share) as interim dividend in August
- DSM’s performance expected to result in further dividend growth
- As a result, expected average payout of 40-50% of adjusted (underlying) earnings
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