Food Specialties
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.
Introduction

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

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

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

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

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

Global external & internal network of biotech specialists

Biotechnological Sciences

Analytical Sciences
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
  - 1950s

- **CHYMOSIN**
  - First company to produce a coagulant by fermentation using recombinant DNA technology
  - 1980

- **PENICILLIN**
  - DSM scientists discover method to produce antibiotics by fermentation
  - 1940s

- **LACTASE**
  - First company to commercialize lactase enzyme for lactose-free dairy
  - 1964

- **REB-M**
  - Enabling further sugar reduction through fermentation-based sweeteners
  - 2000

- **2020**
Introduction

... 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.
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

Food value chain

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

Food additive manufacturers €40bn
- Enzymes
- Antioxidants
- Hydrocolloids
- Colors
- Cultures
- Flavors
- Textures

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

F&B manufacturers €2,130bn

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

Store brands €315bn
- Kraft Heinz
- Tyson
- Heineken
- Carrefour
- Safeway
- Walmart

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

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)

- 2015
- 2016
- 2017
- 2018

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>Create value through market-driven innovation and focus on high growth segments</th>
<th>DSM Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Savory 3-4%</td>
<td>Health &amp; Wellbeing Sugar-Salt-Fat reduction</td>
<td>4-5%</td>
</tr>
<tr>
<td>Enzymes &amp; Cultures 5-6%</td>
<td>Taste Experience &amp; Indulgence</td>
<td>6-7%</td>
</tr>
<tr>
<td>Hydrocolloids 3-4%</td>
<td>Production Efficiency &amp; Sustainability</td>
<td>7-8%</td>
</tr>
<tr>
<td>Bio-preservation 4%</td>
<td>Shelf Life Extension &amp; Food Waste Reduction</td>
<td>5%</td>
</tr>
<tr>
<td>Non-artificial Sweeteners &gt;10%</td>
<td>Understandable &amp; Clean Labels</td>
<td>&gt;10%</td>
</tr>
<tr>
<td>Total ~4%</td>
<td></td>
<td>~5%</td>
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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.
Key innovations

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
Key innovations

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
Key innovations

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