Nutrition & Health

Anup Kothari
President Nutrition & Health division

BASF Capital Markets Day, March 26, 2021
Cautionary note regarding forward-looking statements

This presentation contains forward-looking statements. These statements are based on current estimates and projections of the Board of Executive Directors and currently available information. Forward-looking statements are not guarantees of the future developments and results outlined therein. These are dependent on a number of factors; they involve various risks and uncertainties; and they are based on assumptions that may not prove to be accurate. Such risk factors include those discussed in Opportunities and Risks on pages 158 to 166 of the BASF Report 2020. BASF does not assume any obligation to update the forward-looking statements contained in this presentation above and beyond the legal requirements.
Nutrition & Health targets consumer-driven ingredient markets worth €80 billion\(^1\) with robust growth rates and low cyclicality

- **Aroma ingredients**: €7bn, 3-4%\(^2\)
- **Animal nutrition**: €21bn, 3-4%\(^2\)
- **Human nutrition**: €40bn, 3-5%\(^2\)
- **Pharma**: €8bn, 6%\(^2\)
- **Enzymes**: €4bn, 3%\(^2\)

Higher demand for **natural ingredients**

**Eco-friendliness and sustainability** becoming the decisive purchasing factors

**Health** benefits and **convenience** of growing relevance
Nutrition & Health businesses hold or strive for leading positions among suppliers in their market segments

- **Cost leadership** in citral and derivatives
- **Strong volume growth** after startup of aroma ingredients complex in Kuantan, Malaysia
- >60 products in the scent ranges mint, citrus, rose, lavender, muguet
- **Pioneer** and innovator in feed enzymes
- Enabler for **reduction of antibiotics**
- **Cost leadership in vitamin A**, strong position in vitamin E
- Among leading players in specialty health ingredients
- **Solution provider** in desserts and artisanal bakery
- Pioneer in **vitamin A food fortification**
- **Innovative excipients player** for various applications
- **Strong player in ibuprofen and omega-3**
- Enables production of biologic drugs
- BASF strives for a **leading position** in the global enzymes market
- New Global Business Unit acts as central hub
- Innovation program ensures a continuous stream of new products

1. Percentage of Nutrition & Health division sales 2020
2. Additional sales with enzymes are generated in animal nutrition and the Care Chemicals division
Serving attractive end consumer markets in all regions

Sales by region\(^1\) 2020

- Asia Pacific: 35%
- North America: 18%
- South America, Africa, Middle East: 10%

Sales by direct customer industry 2020

- Nutrition\(^2\): 54%
- Health: 27%
- Others: 19%

1. By location of customer
2. Aroma ingredients business is included in the customer industries nutrition and others
Nutrition & Health operates a profitable and growing business

- Continuous and resilient earnings contributor with healthy growth potential
- Low cyclicality of relevant markets:
  - 3x less cyclical than the chemical industry
  - 10x less cyclical than the automotive industry
- From Q4 2017 to Q4 2018, sales growth was impacted by force majeure for key product lines

---

1 2016: Peak in vitamin prices
2 2017/2018: Force majeure on citral and isoprenol based aroma ingredients, vitamin A, E and several carotenoids, with a significant sales reduction in aroma ingredients, animal and human nutrition
3 Compared with actual market growth
Nutrition & Health’s global asset footprint

**North & South America**
- 3 Production sites
- 1 Research & development hub
- 2 Application and technical service locations

**EMEA**
- 7 Production sites
- 6 Research & development hubs
- 1 Application and technical service location

**Asia Pacific**
- 7 Production sites
- 2 Research & development hubs
- 2 Application and technical service locations
Continual investment and improvements to global assets to ensure customer and market proximity

Europe
Global headquarters animal nutrition, aroma ingredients and enzymes

North & South America
Global headquarters pharma solutions

Asia Pacific
Global headquarters human nutrition

2020
Improvement of ibuprofen production in Bishop, Texas

2021
Vitamin A capacity expansion in Ludwigshafen, Germany

2021
Capacity expansion enzyme plant in Ludwigshafen, Germany

2017–2018
New integrated aroma ingredients complex in Kuantan, Malaysia
Our ambition is to innovate sustainably, invest world-class and grow responsibly

<table>
<thead>
<tr>
<th>Sustainability</th>
<th>Innovation</th>
<th>Digitalization</th>
<th>Asia Pacific</th>
<th>Collaboration</th>
</tr>
</thead>
<tbody>
<tr>
<td>We enable solutions to reduce CO₂ emissions and to fight malnutrition</td>
<td>We deliver targeted innovations for our customers</td>
<td>We strengthen our position as a digital solution provider to our target industries</td>
<td>We meet new consumer demands in our largest growth market</td>
<td>We support our customers with differentiating solutions</td>
</tr>
</tbody>
</table>
We strive for an effective reduction of CO₂ emissions in cooperation with our customers and partners.

- **Sustainable palm oil**
  - Pharma oleochemicals certified according to RSPO¹ in 2019

- **Renewable feedstock**
  - Biomass balance product offerings save fossil resources

- **Renewable energy²**
  - Pilot more sustainable product offerings with renewable energy

1. Roundtable on Sustainable Palm Oil
2. For selected pilot products
4. Due to varying content of palm kernel oil in our pharma oleochemicals, the actual carbon footprint varies by product and can be calculated (incurring additional costs) on demand.
5. REDcert-EU and ISCC-EU

- Up to 36% lower CO₂ emissions for key raw material certified palm kernel oil,³ plus positive impact on biodiversity and social aspects
- >10% reduction of Product Carbon Footprint of oleo excipients⁴
- Up to 20% lower CO₂ product emissions through certified⁵ renewable feedstock
- Scalable, drop-in solution and identical performance
- Up to 20% lower CO₂ emission for selected pilot products through renewable energy credits
- Certification and pilots starting 2021
We will continue to help fight malnutrition worldwide

Call for action
- Reduce vitamin A deficiency in developing countries
- Improve eye health, immune system, child and maternal health
- Fortification of staple foods to fight nutrient deficiencies in all ages

Impact
- Active in more than 42 countries
- Served 750 million people at risk of vitamin A deficiency since 2003
- Target to serve 3 billion people at risk of vitamin A deficiency by 2050

BASF partners
Creating value in aroma ingredients through smart acquisitions delivering targeted innovations for our customers

- Strong R&D pipeline linked to customer projects
- Established customer relationships with key flavor and fragrance players
- Fermentation scale-up expertise

Fermentation-based aroma ingredients market to grow by +10% p.a.¹

>€500 million accessible market²

Acquisition of Isobionics

Product pipeline

2019
- Valencene
- Nootkatone

2020
- Santalol (Isobionics®)
- Alpha-Bisabolene

2021
- Germacrene D
- Alpha-Bisabolol

2022
- More to come

Strengthening our position in natural aroma ingredients

¹ Expected market CAGR 2018–2030² Source: BASF primary and secondary market research
Virtual assistant ZoomLab™ strengthens our leading position as a digital solution provider for the pharma industry

- **ZoomLab™** helps our customers to **save time and resources** in their development pipeline without having to share proprietary information
- Targets all formulators at generic and innovator drug companies worldwide, **with focus on emerging markets**
- **Disruption** of traditional research business model in collaboration **with leading industry partners**
- **Accelerated expansion of customer base, building new business opportunities with digital services**

**Fundamentals | Growth levers:** Sustainability - Innovation - Digitalization - Asia Pacific - Collaboration

- >90 countries
- >500 completed projects
- >800 active users

**3–6 months development time saved**

![Medicine Maker Innovation Awards 2019](image)
Next-generation farming enabled by recently acquired Cloudfarms presents new opportunities for livestock producers

First cloud-based, multi-sited pig production management system

Real-time data registration with a mobile app, allowing **faster decisions** and **better planning** for livestock producers

Enabling a closer connection with the value chain

Our mission: shape the digital ecosystem, improving **traceability**, **animal welfare** and **sustainability**
Asia Pacific holds strong growth opportunities for Nutrition & Health

Food and pharma market¹
Regional split, value share 2020–2025

- Asia Pacific is the largest food and pharma market today
- **Nutrition & Health with double-digit growth** in Asia Pacific in 2019 and 2020
- High **growth potential** due to large population and increasing living standards
- Health and wellness are driven by calorie-rich diets
- Human nutrition business unit moved headquarters from Germany to Singapore in 2018
  - Strengthened market and customer understanding
  - Better access to local talent
  - Build-up of technical capacities and capabilities

<table>
<thead>
<tr>
<th>Region</th>
<th>2020 Value Share</th>
<th>2025 Projection</th>
</tr>
</thead>
<tbody>
<tr>
<td>South America</td>
<td>5%</td>
<td></td>
</tr>
<tr>
<td>North America</td>
<td>21%</td>
<td></td>
</tr>
<tr>
<td>Europe</td>
<td>29%</td>
<td>21%</td>
</tr>
<tr>
<td>Asia Pacific</td>
<td>45%</td>
<td>48%</td>
</tr>
</tbody>
</table>

¹ Source: BASF primary and secondary market research
We help our customers to optimize cost and differentiate themselves in the biopharma market

Success story – excipient Kolliphor® P 188 Bio¹
Sales, indexed

Global biopharma ingredients market
to grow by +10% p.a.¹

- Broad pharmaceutical formulations expertise
- Global presence to innovate for local needs
- Leading regulatory capabilities
- Leveraging Verbund integration

¹ Estimated market growth: CAGR 2019–2029; ² Source: BASF primary and secondary market research
We are investing to follow a clear growth path in consumer markets, supported by digital and sustainable solutions

**Sustainability**
- Offer **Product Carbon Footprints** for portfolio
- Enable customers to avoid CO₂ emissions, for example, by using **renewable feedstock**
- Serve **3 billion people** at risk of vitamin A deficiency by 2050

**Innovation**
- Benefit from R&D pipeline with **>65% share of Accelerator solutions**; supported by dedicated acquisitions
- Grow through **targeted innovations** in high-growth areas such as natural aroma ingredients

**Digitalization**
- Strengthen our leading position as a **digital solution provider** for the pharma industry
- Shape the digital ecosystem for **livestock farming**, improving traceability, sustainability and animal welfare

**Asia Pacific**
- Continue on our **growth path** fueled by increasing demand for innovative solutions
- Enhance our **market and customer understanding**, as well as access to local talent

**Collaboration**
- Support our customers in **differentiating themselves** in end consumer markets
- Pursue partnerships to create **market-oriented solutions**
- Offer digital solutions leveraging our **industry expertise and know-how**