July 2023
www.PerfumerFlavorist.com

# perfumer & flavorist®

The Resource for Sensory & Wellness Innovation



Industry Insights:
Sustainable Ingredients &
"Free-from" Ingredients

Product Roundup:
Ingredients & Equipment

## 2023 Leaders & Newsmakers

*Key players in F&F share company growth, innovations and market drivers in the industry over the last year.*

Flavorcon 2023 Serves Up Sessions on Flavor Development

**WANT MORE?**

*Check out our digital magazine exclusives!*
***www.PerfumerFlavorist.com/DM***

Allured business media



# BE Diversified

**300+** ESSENTIAL OILS

**2500+** AROMATIC CHEMICALS

**50+** ORGANIC OILS

Berjé maintains the most diverse inventory of essential oils and aromatic chemicals in the United States. We supply over 3,000 unique materials at any given time, and more than 86% of these materials are sourced from multiple origins. This multi-geographic approach guarantees our customers access to an unparalleled palette of ingredients at any time of year.

THE BERJÉ GROUP

The privatively-owned flavor and fragrance ingredient source since 1949.
+1 973 748 8980 • www.berjeinc.com

*always*
*inspiring more ...*

symrise

Cooling · Menthol · Fresh · Minty

# SYMCOOL® NATURAL

The natural cooling agent Symcool® Nat. provides smooth cooling sensations to mint and fruit flavors with a very good longevity. It convinces with a natural fresh and well-rounded cooling effect in flavor creations. At low levels it can also be used to impart overall freshness and fruitiness into berry, citrus and other fruit flavors. The suggested use level in food ranks from 1 to 2000 ppm.

***www.symrise.com***



# CONTENTS

VOL. 48 NO. 7 | JULY 2023











6 **Editor's Note: Trailblazers in Flavor & Fragrance**

DM1 **Industry Insights: Sustainable Ingredients & "Free-from" Ingredients**
Industry professionals weigh in on recent developments in the categories, common misconceptions and white space for innovation.

8 **Product Roundup: Ingredients & Equipment**

8 **[Podcast] Challenges and Opportunities of Formulating with Alliums**
Kalsec principal flavor chemist Shane McDonald alongside lead scientist and chef Ken Burns connect to discuss how flavorists can build culinary dimension with alliums.

9 **[Video] Breaking Down the Finer Points of the Mass Balance Approach**
Solvay Naturals marketing manager Maud Joassard connects to discuss the key aspects of the mass balance approach for companies to understand.

DM7 **Industry News**

10 **2023 Leaders & Newsmakers**
Executives from some of the most influential F&F companies provide an in-depth look at the last year and provide insight into what's to come.

- 12 ADM
- 13 BASF
- 16 Firmenich
- 20 Givaudan
- 24 Iberchem
- 26 IFF
- 28 Kerry
- 29 Mane
- 34 Robertet
- 38 Sensient
- 41 Symrise
- 44 Takasago
- 46 T. Hasegawa

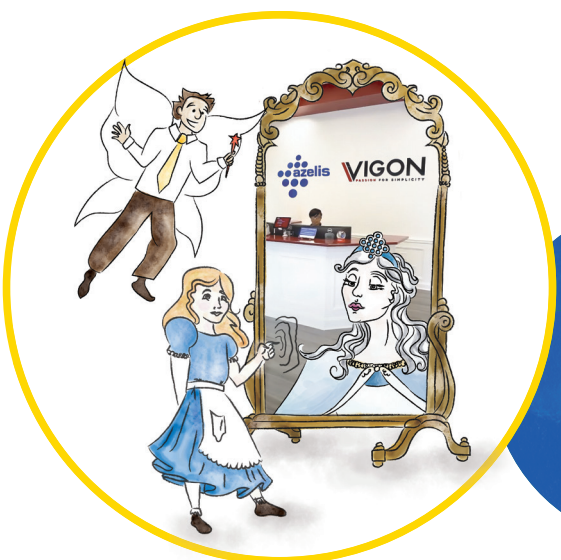
DM59 **Flavorcon 2023 Serves Up Sessions on Flavor Development**
Innovative sessions on flavor development are on the menu at this year's event.

48 **Ad Index**

# MAGICAL GUIDES IN THE Yipppeee!™ Wonderland!

Vigon's customer service team will leave you grinning from ear to ear. Come through the looking glass for a wonderland of service.






Vigon and Azelis together, a happily ever after for you.

vigon.com

azelis

VIGON
PASSION FOR SIMPLICITY

# CONTENTS

perfumer & flavorist


CATCH UP ON OUR LATEST
**VIDEOS AND PODCASTS!**

*Gain valuable insight on materials, trends and innovations impacting the flavor and fragrance industries.*




**RECENT VIDEOS**

- Creating a Highly Efficient Flavor and Fragrance Manufacturing Plant
- Discussing Flavor, Fragrance and Legacy with Frallier
- WPC 2022 Re-Cap

**RECENT PODCASTS**

- Perfumer Nathalie Benareau Discusses Sustainability in Fragrance Formulation
- Two Sense: Preparing for Flavorcon 2022 with John Wright
- Two Sense: Candle & Air Care Market Trends with Amy Marks-McGee

perfumer & flavorist

**Watch and Listen Now!**
**www.perfumerflavorist.com/multimedia/**


**Want to report a new development at your company?**

Send the details to:

*Perfumer & Flavorist+* magazine
336 Gundersen Drive, Suite D
Carol Stream, IL 60188-2403 USA
fax: 1-630-653-2192 • e-mail: perfumer@allured.com

@perfumerflavorist
Perfumer & Flavorist
@PandFMagazine
@perfumer_flavorist


EDITORIAL

| | |
|---|---|
| **Content Director** | Jeb Gleason-Allured \| 1-630-344-6069/jallured@allured.com |
| **Editor in Chief** | Katie Anderson \| 1-630-344-6077/kanderson@allured.com |
| **Managing Editor** | Jenna Rimensnyder \| 1-630-344-6053/jrimensnyder@allured.com |

SOCIAL MEDIA

| | |
|---|---|
| **Social Media Specialist** | Naidine Ramirez \| 1-630-344-1821/nramirez@allured.com |

ADVERTISING SALES

| | |
|---|---|
| **Associate Publisher** | Paige Crist \| 1-630-344-6060/pcrist@allured.com |
| **Advertising Production Manager** | Kasia Smialkowski \| 1-630-344-6025/ksmialkowski@allured.com |

AUDIENCE DEVELOPMENT

| | |
|---|---|
| **Marketing Specialist** | Nicolette Ferengul |
| **Customer Service** | 1-847-559-7554/customerservice@perfumerflavorist.com |

DESIGN

| | |
|---|---|
| **Assistant Design Manager** | James Fergus |
| **Senior Graphic Designer** | Hon Bannapradist |
| **Digital Production Specialist** | Kyle Torain |

CORPORATE

| | |
|---|---|
| **Partner & CEO** | George Fox |
| **Partner & President** | Janet Ludwig |
| **Director of Events** | Christine Meehan |
| **Marketing & Creative Director** | Kim Fry |
| **Digital Products Director** | Rose Southard |



Allured business media

**Allured Business Media**
1-630-653-2155 • fax 1-630-653-2192
336 Gundersen Drive, Suite D
Carol Stream, IL 60188-2403 USA
*www.Allured.com*


OTHER ALLURED PRODUCTS

*Flavorcon*
*World Perfumery Congress*
*Cosmetics & Toiletries* magazine
*Cosmetics & Toiletries* magazine: Portuguese edition
*Global Cosmetic Industry* magazine
*Beauty Accelerate*
*Skin Inc.* magazine
*Face & Body* Skin Care Show
*Beauty Launchpad* magazine
*Beauty Go Pro Show*
*MedEsthetics* magazine
*WellSpa 360* magazine
*WellSpa 360 Expo*
*Nailpro* magazine
*Nailpro Show*


**SUBSCRIPTIONS**

***Perfumer & Flavorist+*** (ISSN 0272-2666) is published monthly by **Allured Business Media**.

**Subscriptions:** Subscribe online: *www.PerfumerFlavorist.com/subscribe*

For both the US and internationally, telephone: 1-847-559-7554
(9 AM-5 PM Central, Mon-Fri) | Fax: 1-847-291-4816
E-mail: customerservice@perfumerflavorist.com
Address: *Perfumer & Flavorist+*, PO Box 3009, Northbrook, IL 60065-3009

Periodicals Postage paid at Carol Stream, Illinois, and additional mailing offices.

Print subscriptions are free to qualified individuals in the United States.
Print subscriptions are not available to those living internationally.

**POSTMASTER:** Send address changes to *Perfumer & Flavorist+*, PO Box 3009, Northbrook, IL 60065-3009

**Change of address:** Give both the new and old addresses. Allow two months for a change to become effective.

**Missing issues:** Claims for missing issues must be made within three months of the date of issue.



Allured Business Media makes all attempts to publish accurate information; however, this publication may contain technical inaccuracies or typographical errors. The reader assumes all risks concerning the suitability and accuracy of the information within this publication. Allured Business Media assumes no responsibility for and disclaims all liability for any such inaccuracies, errors or omissions in this publication and in other documentation referred to within or affiliated with this publication.

Copyright 2023: Authorization to photocopy articles and news is granted by Allured Business Media, provided that the fee of US$6 per copy per item is paid directly to the Copyright Clearance Center Transactional Reporting Service, 21 Congress St., Salem, MA 01970—Publication No. 0272-2666/01/$6.



# Vanillin, Natural

## One product. Endless possibilities.

With its smooth notes and creamy texture, it's no surprise that Vanillin, Natural can be found in hundreds of flavor and fragrance combinations. But endless possibilities need a supply to match.

At Aurochemicals, Vanillin, Natural is at the top of our list. We're stocked so you'll never have to delay your production.

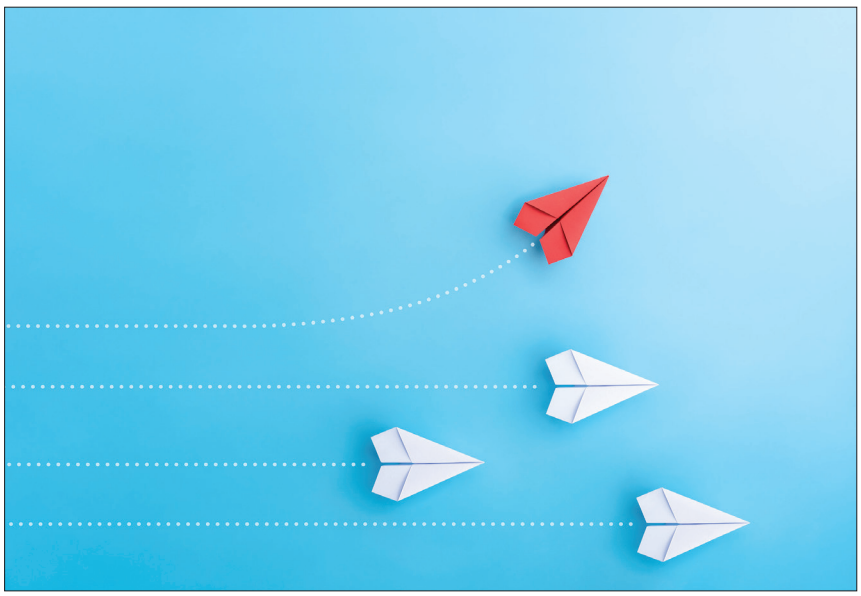
**All natural - 99% pure.**

**aurochemicals.com | 1-866-875-AURO**

auro CHEMICALS

**The Natural Choice for Flavor and Fragrance Ingredients**

# Trailblazers in Flavor & Fragrance



*The July issue is dedicated to hearing from the leaders and newsmakers in flavor and fragrance.*

The Leaders & Newsmakers issue returns just after the official announcement of the dsm-firmenich merger. In early May 2023, weeks before the one-year anniversary of the merger announcement, dsm-firmenich now boasts nearly 30,000 employees and is aiming to be "a trailblazer in the reinvention, manufacturing, and combination of vital nutrients, flavors and fragrances."

Speaking of trailblazers, in the pages ahead, readers will hear from key players in the flavor and fragrance industry regarding recent strides over the last 12 months, key factors shaping innovation and impacts of evolving regulatory updates.

This month's Industry Insights section is dedicated to sustainable ingredients and free-from ingredients. Get a look at recent updates in pivotal areas within the industry within the digital edition (**Page DM1**).

## *Flavorcon* 2023

We are inching closer to the return of *Flavorcon* 2023 (*www.flavorcon.com*). Are you registered? You don't want to miss the latest insights from flavor experts across the industry. Not to mention an expo hall loaded with ingredients, technology and services that can take your formulations to the next level. Be sure to leave room for networking! Hundreds of flavor professionals from around the world are set to assemble November 8-9 in Cincinnati, OH. Discover two fresh sessions added to the *Flavorcon* 2023 roster in the digital edition on **page DM59**.





**JENNA RIMENSNYDER**
Managing Editor
jrimensnyder@allured.com

## Editorial Advisory Board

**SCOTT CHAPLAN**
SCMC Consulting

**DARRYL DO**
Perfumer, Delbia Do Fragrances

**ALISON FREEDMAN**
Senior Flavorist
Firmenich

**CYNDIE LIPKA**
Principal Flavorist
Bell Flavors & Fragrances

**RISHABH C. KOTHARI**
President of Fragrances and Flavours Association of India

**NEHA OKHADE**
Perfumer
Agilex

**JOHN WRIGHT**
Independent Flavorist and Author



# CREAM *of the* CROP

**cis-4-Heptenal, Natural**
FEMA 3289 *dilutions available*
dairy, milky, creamy, cheesy

**delta Dodecalactone, Natural**
FEMA 2401
creamy butter

**p-Cresol, Natural**
FEMA 2337 *dilutions available*
barny, cheesy, milk

**Methylthio Isovalerate, Natural**
FEMA 3864
creamy, dairy, cheesy

Natural Advantage

318-215-1456
**www.NatAdv.com**

**For Sample Requests: Samples@NatAdv.com**

**Naturals from the Name You Trust!**

**Technical Support and Warehousing in Europe and United Kingdom see RiversideAromatics.com**

## Featured Insiders:

- Lanxess
- Naturamole
- Sensient Flavors and Extracts
- Solvay



*Sustainable ingredients can be either natural or synthetic, as long as the means to get them are cleaner and more circular than in the past.*

Reproduction in English or any other language of all or part of this article is strictly prohibited. © 2023 Allured Business Media.

# INDUSTRY INSIGHTS:

# Sustainable Ingredients & "Free-from" Ingredients

Industry professionals weigh in on recent developments in the categories, common misconceptions and white space for innovation.

Sustainability has become an integral part of the flavor and fragrance industry. An important aspect to sustainable practices at F&F companies includes the selection of ingredients offered. But what exactly does a sustainable ingredient entail? *Perfumer & Flavorist+* (*P&F+*) tapped a few industry professionals to discuss the most common misconceptions, what clients are looking for in terms of sustainable ingredients and recent developments in the market place.

## SUSTAINABLE INGREDIENTS

### **FLORENT GLASSE,** director of sales, Naturamole

***P&F+*: What are some of the most common misconceptions about sustainable ingredients?**

**Florent Glasse [FG]:** The first—and main— misconception is that sustainable does not mean *natural*. Sustainable ingredients can be either natural or synthetic, as long as the means to get them are cleaner and more circular than in the past. And here comes the speech about biotechnology.



*Florent Glasse*

Thanks to the latter, the raw materials producers will be able to minimize the negative impact on the environment, social and economic factors.

The other typical misconceptions are that sustainable ingredients are:

- **Always more expensive.** Nowadays, thanks to improved processes, they can be competitively priced, especially when factors like long-term environmental and social costs are considered.
- **Not as effective as conventional ingredients.** Indeed, many sustainable ingredients are just as effective, if not more effective, than their conventional counterparts, and they often offer additional benefits.
- **Limited in variety.** It was true 10 years ago, but not anymore. It's clear that sustainable ingredients are increasingly becoming more diverse and accessible as the demand for sustainable products continues to grow.
- **Only a marketing trend.** It's vital to understand that sustainable ingredients are an important aspect of responsible and ethical business practices, and their use can have a real and positive impact on the environment, society, and the economy. Impact that is requested for the world to keep on striving.

***P&F+*: What are clients asking for when it comes to sustainable ingredients?**

**FG:** In the last few years, as end-consumers became more demanding about what was inside the goods they are purchasing, the industries (F&F making companies) are asking for more and more transparency, from the initial materials to the finished sustainable ingredients. Also, they need to get the full information about the processes involved in the making of the ingredients. The goal is for them to get to understand every single step shown in the production flowcharts. It means that today our customers need/are able to understand basic and less basic chemistry as well as biotechnological pathways.

Consumers are also asking for assessment over environmental friendliness data that proves that the input raw materials are ethically sourced and reports that show that the vendor companies are socially responsible (support over local communities, creation of jobs, or contribution to the well-being of the people who produce the ingredients).

Overall, clients are increasingly interested in sustainable ingredients, as they recognize the importance of responsible sourcing and environmental stewardship in their businesses.

***P&F+*: Can you touch on some of the recent developments in terms of technology or the development of sustainable ingredients for F&F?**

**FG:** I'll talk about the field I know the most about—biotechnology. Lately, more and more companies are focusing on the switch from conventional processes to a more sustainable one via the use of a "new" toolbox that is the biocatalysis.

It allows production bottlenecks of the past to be overrun, as well allows for an increased panel of products to be worked-on.

It is estimated that there are thousands of different types of enzymes that exist in nature, each with its own specific structure and function. Meaning that there should exist an enzyme, or a cascade of enzymes, that will allow you to eventually produce whatever molecule you're targeting industrialize.

Enzymes are biological catalysts that speed up chemical reactions and they are involved in a wide range of metabolic processes, including digestion, energy production and DNA replication. Some examples of commonly known enzymes include lactase (process used by Lactalis, Danone, etc.), which breaks down lactose in milk, amylase (process used by Tate & Lyle, Cargill, etc.), which breaks down carbohydrates, and lipase (process used by DSM, Naturamole, etc.), which breaks down fats.

***P&F+*: What do you think the future holds for sustainable ingredients?**

**FG:** The future of sustainable ingredients is looking bright, as consumers become increasingly aware of the environmental and social impact of the products they use and demand more sustainable options. From my point of view, there are a few trends that are likely to shape the future of sustainable ingredients, like increased demand for plant-based and natural ingredients, innovation in sustainable ingredient production, emphasis on transparency and traceability and greater collaboration between stakeholders across the supply chain (including producers, manufacturers, retailers and consumers).

I'm sure that sustainable ingredients are here to stay, and will continue to play an important role in promoting a more sustainable and ethical future for our planet.

## **PAUL WANROOIJ,** global marketing manager, Lanxess

***P&F+*: What are some of the most common misconceptions about sustainable ingredients?**



*Paul Wanrooij*

**Paul Wanrooij [PW]:** There are several misconceptions about sustainable ingredients, but the good thing is that education and understanding of them is becoming mainstream. Let me pick two relevant for the F&F industry:

1. Some still may see sustainability as a passing trend, but this view is becoming outdated. Driven by the growing awareness of climate change, consumer preferences and the implementation of strict regulatory frameworks, today sustainability is a vital long-term approach in business – and the industry must take action now. As Lanxess Flavors & Fragrances business, we produce and develop a broad portfolio of aroma ingredients, preservatives, multifunctionals and intermediates. Lanxess is committed to making our entire value chain climate-neutral by 2050 and by the end of 2023 we will offer sustainable product variants across our entire F&F portfolio.
2. Another misconception is that petrochemical-based ingredients cannot be sustainable. But by switching to renewable energy sources and natural feedstocks, we can maintain the benefits of our nature-identical but petrochemical-based ingredients while adding sustainable elements such as carbon renewability and low carbon footprint. Our approach enhances the existing benefits of Lanxess aroma ingredients: odor performance, quality stability, supply predictability, mass availability and economic feasibility. Our mass balance certified renewable products (which we have collected under the brand ScopeBlue[a]) seamlessly integrate into existing production processes without compromising product quality, eliminating the need for our customers to make process modifications. As a result, we not only strive to meet our own $CO_2$ reduction targets (already 36% reduction since the creation of our Business Unit in Lanxess) but also actively support our customers in achieving their sustainability goals while keeping affordable olfactory performance.

[a]ScopeBlue is a trademark of Lanxess

***P&F+*: What are clients asking for when it comes to sustainable ingredients?**

**PW:** Generally, clients ask for a complete set of sustainability elements for their ingredients such as renewable carbons, biodegradability, low $CO_2$ footprint, social responsibility, low waste factors and mild chemistry use–in combination with transparency and third-party certification.

By collaborating with suppliers like Lanxess, who uphold strong standards of social and environmental responsibility for the ingredients used in their formulas, clients can ensure alignment with their Environmental, Social, and Governance (ESG) targets. As a trusted global leader in the industry, Lanxess recognizes and implements customer requirements as a key part of our future strategy. We have positioned ourselves as one of the industry's pioneers by utilizing renewable energy, biomass and a third-party ISCC+ certified mass balance approach for our five global production facilities. This allows us to ensure transparency about the use of sustainable raw materials along our entire value chain.

***P&F+*: Can you touch on some of the recent developments in terms of technology or the development of sustainable ingredients for F&F?**

**PW:** Through close collaboration with our customers and partners we drive progress in sustainable ingredient development. We are committed to providing our customers with concrete options to reduce their Scope 3 emissions that are based on renewable feedstock and produced with green energy. As already highlighted, by this year we will provide mass balance certified renewable alternatives for our entire F&F product portfolio. We are replacing feedstock in our manufacturing processes with biosources to achieve this. This includes products with high load in fragrance compounds as Kalama[b] Hexyl Cinnamic Aldehyde, Lanxess Benzyl Acetate[c] and Lanxess Benzyl Benzoate[d] Ultrapure to have significant impact on the sustainability score of the entire compounds. The first products are already available. To display our progress, Lanxess has developed a Product Carbon Footprint Engine that calculates carbon footprint emissions per product using a cradle-to-gate approach and allows a comparison to industry standards.

When it comes to sustainable technology, one of our key strategies is to actively transition our energy sources to green alternatives. Our India site serves as a prominent example because it is soon expected to be a climate neutral production site (Scope 1 & 2). Here we only utilize biomass for the in-house production of steam and electricity, significantly reducing our dependence on black carbon sources. We also have committed to responsible water use practices by exclusively using municipality wastewater as intake for process water. All water is regenerated and re-used and not discharged.

***P&F+*: What do you think the future holds for sustainable ingredients?**

**PW:** Achieving zero Scope 3 emissions by early mid-century will necessitate working exclusively with sustainable ingredients. From an environmental, regulatory, economical and consumer preference standpoint, there is no turning back. We recognize that redesigning the current petro route to minimize carbon emissions is and will be crucial to make the transformative shift happen in order to keep the F&F industry supplied with ingredients that today give necessary performance to the compounds.

As businesses will increasingly be evaluated based on their ESG outcomes, the importance of reliable and responsible partners who can meet sustainability requirements increases and we are proud to cater to this demand. In the future strong collaboration, expertise and the integration of cutting-edge technology will further empower both our company and our customers to make informed choices by identifying the most environmentally friendly options available for product development. At Lanxess, we understand that sustainability is an ongoing journey, motivating us to continuously innovate and to ensure a conscientious approach to F&F creation with high quality products that perform well.

## **SANDRA MORI,** manager, Development & Marketing, Solvay

***P&F+*: What are some of the most common misconceptions about sustainable ingredients?**

**Sandra Mori [SM]:** One of the most common misconceptions about sustainable ingredients is that they must sacrifice performance and competitiveness in order to be environmentally friendly. Some people believe that sustainable products do not work as well as the products they are designed to replace. However, for a sustainable product to be viable in today's highly competitive markets, it must offer equal or better performance than existing standards. Sustainable products can be both environmentally friendly and competitive in terms of cost and performance. It is essential to communicate the sustainability of these products

[b]Kalama Hexyl Cinnamic Aldehyde is a trademark of Lanxess
[c]Lanxess Benzyl Acetate is a trademark of Lanxess
[d]Lanxess Benzyl Benzoate Ultrapure is a trademark of Lanxess

effectively and engage in sustainable practices throughout the supply chain to ensure that sustainability is truly achieved.

***P&F+*: What are clients asking for when it comes to sustainable ingredients?**

**SM:** Natural raw materials from renewable sources have been valued by the end consumer, while carbon neutral ingredients or with a significant reduction in emissions are also valued by the industry as part of its ESG goals. This is a challenging transition, but at Solvay we have been accelerating it through initiatives such as the implementation of a mass balance portfolio, investment in reforestation projects and new industrial technologies that reduce energy consumption and the emission of greenhouse gases. In our solvents' industrial plant, for example, 95% of $CO_2$-equivalent emissions are already abated.

***P&F+*: Can you touch on some of the recent developments in terms of technology or the development of sustainable ingredients for F&F?**

**SM:** Solvay has a sustainable portfolio of vanillin and solvents for various applications in the fragrance and air care industry. The Aroma Business unit offers Rhovanil[e] Natural CW, a natural based product, produced from rice bran and Rhovanil MB, the world's first ISCC Plus mass balance certified range of high-purity vanillin. Augeo[f] is an innovative line of bio-based solvents developed from glycerin, a renewable source, composed of versatile molecules, with high solubility power and low odor. Recently, Solvay launched Solsys[g] Bio ETAC, a 100% bio-based ethyl acetate produced from ethanol, a derivative of biomass widely used as biofuel in Brazil from certified areas and not related to deforestation regions.

***P&F+*: What do you think the future holds for sustainable ingredients?**

**SM:** Consumers and industries will continue to increase demand for sustainable ingredients as everyone becomes more aware of the need to change products and processes to lead to a safer environment and more sustainable products. Industries will value multipurpose ingredients that improve the performance of their formulations, such as reinforcing the odor and guaranteeing the lasting of the fragrance for a longer period of time, while being both renewable and reducing the environmental footprint of their manufacture. The industry will need to find solutions to comply with all the claims/labels required for the demanding end users for environmentally friendly products. Despite the difficulty to fulfill all requirements the industry will need to harmonize and simplify the several Life Cycle Analysis methodologies to generate comparable metrics, and be able to compare products, being as clear as possible to avoid greenwashing. To increase these practices, there are great initiatives coming, such as the Together for Sustainability (Tfs), of which Solvay is a member. Tfs is a joint initiative of chemical companies focused on the promotion of sustainability practices in the chemical industry's supply chain, currently gathering chemical companies around a single standard of auditing and assessment.

[e]Rhovanil is a registered trademark of Solvay
[f]Augeo is a registered trademark of Solvay
[g]Solsys is a registered trademark of Solvay

## "FREE-FROM" INGREDIENTS

The global free-from food market was valued at $71,381.2 million as of 2023, according to Mordor Intelligence[h]. This segment encapsulates dairy-free, meat-free, gluten-free, etc. type foods. Consumer awareness regarding labeling allergen-free and dairy-free product claims and other ingredient claims is driving the market for these food products. A voice from Sensient will weigh in on the recent trends and innovations influencing the market as well as what the future holds.

### **MATHIAS BOHN V,** Senior Product & Strategy manager, Flavors NA, Sensient Flavors and Extracts

***P&F+*: How have consumer demands, labeling, regulations or recent trends influenced recent innovations in the "free-from" ingredients market?**


*Mathias Bohn*

**Mathias Bohn [MB]:** As the industry continues to evolve through the scientific research of products that contribute to allergic reactions in people, or consumer interest in removing certain ingredients due to the real or perceived perception of wellness, the food industry must respond. The most recent update to sesame being added to the major allergen status has come with multiple challenges from the manufacturers to the consumers concerned about

[h]*https://www.mordorintelligence.com/industry-reports/free-from-food-market*

if the change means a concern to their well-being. In multiple cases, products that would often be considered non-allergenic after specific processing are still concerns for the industry and consumers alike. If you have a soy allergen, are you going to eat a product that says "contains soy" even if the form of that product could be considered non-allergenic in the example of soybean oil, or hydrolyzed soy protein? In certain cases, there are a variety of possible alternative ingredients that can be used in substitution such as soy protein being changed to pea or other varieties which may require some taste modulation technology for masking or other taste performance. In others, such as removing gluten, there is a much more challenging functional aspect that must be reviewed and developed that changes the entire basis of the original product.

***P&F+*: What does the future look like for the "free-from" ingredients market? What are some of the emerging trends?**

**MB:** When reviewing the current and future state of "free-from" this falls within a few broad categories including Nutrition, Allergen, (customer or processing perspective), Sustainability, or Clean-label/Regulatory Claim (vegan, kosher, halal) concerns. More recent concerns that have arisen include ingredients that contribute significant costs or could have large changes in costs such as eggs, or other agricultural sources that vary dynamically based on the changing world environments. Issues ranging from the climate to geo-political concerns can create shortages or key ingredients being completely unavailable have inspired formulators to move away from them. This can be an instance where flavors can still include smaller ratios of ingredients or "type" of flavors that do not contain the profile ingredients without missing the overall taste perception in the finished products.

***P&F+*: Can you share some of the recent innovations in the "free-from" ingredients market?**

**MB:** The future is very interesting and evolving incredibly quickly with the degree of possible "free-from" opportunities. From the perception of consumers or retailers on what ingredients are "cleaner" than others between sugars, starches and gums that started the "no-no" lists to the evolution of bio-active ingredients possible through precision fermentation or cultured products. These can create new compounds suitable to replace functions or flavors of ingredients or utilize cells of the starting materials that can be produced and managed in a more controlled manner. Other innovations are coming from the ingredient manufacturers themselves with new products that perform similar or better than past offerings with new label opportunities, such as native starches versus modified food starches. Then there is the continuing opportunity for taste modulation from flavors that can mask, enhance, or add taste systems in coordination with the utilized ingredients from alternative or non-traditional ingredients. Especially as the market starts to review the opportunity of free from "added" ingredients such as salt, sugar or MSG as examples. This evolution is driving innovation across the ingredients, flavors and the product formulations for finished products that still meet the expectations of taste along with the brands targets for the labels from the claims, ingredients and nutritional.

perfumer & flavorist
The Resource for Sensory & Wellness Innovation
SUBSCRIBE TODAY!
www.PerfumerFlavorist.com/subscribe



# Ingredients and Equipment



## 2-Hydroxy-4-Methylbenzaldehyde

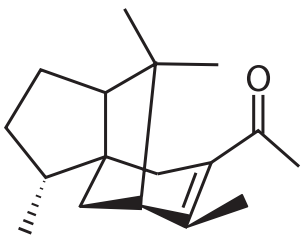
**Penta International Corp**
*www.pentamfg.com*

Now offering 2-hydroxy-4-methylbenzaldehyde (FEMA# 3697, CAS# 698-27-1). It contains a flavor base such as fruity, almond and bitter almond. Odor notes include phenolic, bitter almond, cherry and fruity. Our material is food grade, kosher and halal.

## Methyl Cedryl Ketone

**Hangzhou Grascent Co., Ltd**
*www.hangzhougrascent.com*

Methyl cedryl ketone (FEMA# 2668, CAS# 32388-55-9) has a rich woody odor with an amber-musk note. It can be used for fine fragrance, personal care, fabric care and home care.



Click above to play



## Red Mandarin Essential Oil Cold Pressed

**Agrumaria Reggina Srl**
*https://issuu.com/agrumaria/docs/agrumaria_reggina_oils_product_profile_2021.2_eng*

Elevate your creations with our red Mandarin essential oil cold pressed (CAS# 8008-31-9, FEMA# 2657). Sustainably crafted, it brings versatile allure to flavors, perfumery and detergents applications. Experience the captivating essence of Sicilian mandarins, traced for quality assurance. Add vibrant beauty to your portfolio with our red Mandarin essential oil.



## Flavors, Extracts, Taste Technologies

**Sensient Flavors & Extracts**
*www.sensientflavorsandextracts.com*

Sensient Flavors & Extracts is a division of Sensient Technologies Corporation and one of the world's leading flavor and extracts companies, operating in 30 countries. Sensient's innovative technologies offer optimal choices for complete flavor system development.



## Furfuryl Thioacetate

**Symrise AG**

*www.symrise.com/de/scent-care/aroma-molecules/flavor-ingredients/#Furfuryl-Thioacetate*

Furfuryl thioacetate (FEMA# 3162, CAS #13678-68-7) acts as a key component for coffee flavors. Its dark roasted and subliminal, soft sulfur notes represent the scent of freshly ground coffee. When dosed in smaller quantities it can go into many kinds of roasted flavor types—for example, into vegetable, meat or nut flavors.



## 6-Methyl-5-hepten-2-ol

**Natural Advantage, LLC**

*www.natadv.com*

Natural Advantage introduces brand new GRAS material, natural 6-methyl-5-hepten-2-ol (FEMA# 4884, CAS# 1569-60-4). This material occurs naturally in tomato, strawberry and raspberry. Natural 6-methyl-5-hepten-2-ol is typically known for its importance in tropical and citrus flavors; however, it also performs exceptionally well in dairy products. This product can be used for butter, cheese, milk and cream; while softening the effects of harsh saturated ketones, 6-methyl-5-hepten-2-ol also adds creaminess and can enhance cheese flavors, particularly cheddar and blue cheese. Recommended use levels are 5 ppm-200 ppm.



## Vinyl Gaiacol

**Mane**

*www.mane.com/ingredients*

Elevate your sweet and savory creations with vinyl gaiacol (FEMA# 2675, CAS# 57-55-6). This incredible 100% EU-natural molecule exhibits a smoky, clove-like profile with sweet, gourmand facets, providing a comforting character. Especially interesting to enhance the warmth in vanilla, chocolate, and coffee flavors and smokiness in barbeque and cured meat applications.

Click above to play

# Iberchem Debuts Wavemotion Neuroscientific Investigation Program



*Wavemotion is designed to unveil insights into how scent can influence positive neural responses to transform the emotional landscape of consumers and elevate consumer well-being.*

Iberchem has introduced its latest neuroscientific investigation program, Wavemotion. Designed to scientifically evaluate the impact of fragrance on human psychology and physiology, Wavemotion will unveil insights into how scent can influence positive neural responses to transform the emotional landscape of consumers and elevate consumer well-being.

Neuroscientific specialists Michael White, New Technologies director at Iberchem, will be leading the Wavemotion program. Utilizing multi-dimensional, sophisticated neuroscientific techniques and physiological practices, Wavemotion will explore the processing of odor signals within interconnected structures of the brain.

White shared, "Wavemotion will bring a new dimension to the world of fragrance innovation. Understanding the functional connectivity and physiological correlates of emotion upon fragrance exposure, will reveal unprecedented opportunity for the expansion of Iberchem's fragrance portfolio."

## Testing

At in-cosmetics 2023 attendees utilized Iberchem's interactive, live on-stand experience, exploring scents and emotions by smelling four fragrances, each of which had been neuroscientifically tested and proven to boost a specific emotion.

Choosing from either happy, invigorating, sensual, or relaxed, attendees mapped which mood zone they sensed the fragrance enhanced onto a large brain model. Throughout the event, the white brain filled with brightly colored stickers, gradually showcasing how each fragrance influenced the attendee's emotional landscape.

Iberchem's Wavemotion program is now analyzing these results to further apprehend the distinctive patterns developed in each mood zone.

Reproduction in English or any other language of all or part of this article is strictly prohibited. © 2023 Allured Business Media.

# Doehler Inaugurates Taste Innovation Hub in New Jersey




*Doehler debuted its office and lab hub in North Brunswick, New Jersey, with a ribbon-cutting ceremony hosted on April 26, 2023.*

Doehler has debuted its office and lab hub in North Brunswick, New Jersey, with a ribbon-cutting ceremony hosted on April 26, 2023. The recently inaugurated facility is said to be a state-of-the-art center for taste with a focus on flavor and taste modulation innovation. The North Brunswick location marks Doehler's fourth location in the United States.

Doehler's North Brunswick hub will offer more than 12,000 square feet of laboratory space including a flavor analytics laboratory equipped with both volatile and non-volatile capabilities, as well as a functional extraction laboratory.

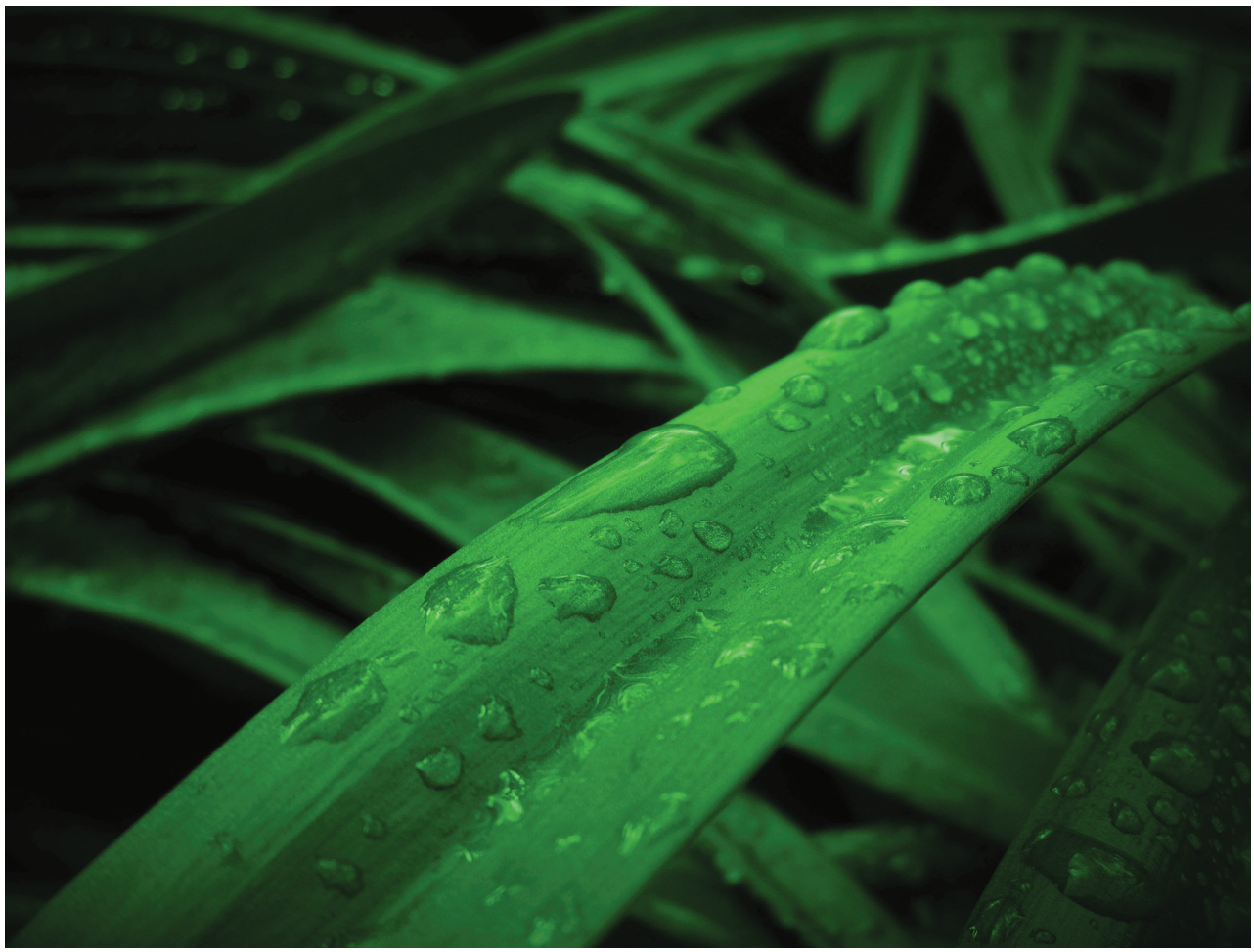
The site will also act as an east coast hub for Doehler Ventures, which supports early-stage start-ups, currently located in Los Angeles, California. In addition, it will scale up the global strategic partnership of Doehler and Ixora Scientific, a San Diego-based start-up that focuses on the research and development of innovative taste modulators based on botanicals.

Doehler has shared plans to utilize ultramodern sampling technology within the North Brunswick location. The company has also announced plans to expand its Cartersville plant to include an automated flavor production facility and bring additional capacity, customer-facing meeting spaces and administrative offices.

Deborah Kennison, R&D vice president at Doehler in North America, expressed, "We are thrilled to share that Doehler's North Brunswick hub is featuring in-house sensory screening capabilities with expert panels. This, combined with the expertise of our global sensory team allows us to provide our customers with lab to industrial-scale solutions spanning the entire spectrum from flavor, functional ingredients and foodstuff to finished products with advantaged economics."

Paul Graham, Cluster Americas CEO at Doehler, stated, "Our investment in the North Brunswick hub reflects our commitment to meeting the evolving needs of the US food and beverage industry. We feel that Doehler is well positioned to help our customers stay ahead of the curve in a rapidly changing market."

# Givaudan Unveils Geogaia Designed to Replicate Petrichor Scent



*Petrichor is defined as the smell that comes from the ground when rain falls after a dry period.*

Givaudan has revealed its latest ingredient Geogaia, designed to translate the "luscious and multifaceted scent of petrichor, providing green, earthy and watery tonalities to the fragrances." Petrichor is defined as the smell that comes from the ground when rain falls after a dry period.

Geogaia has been supported by the Givaudan Proprietary Mood Portraits 2.0 testing approach and InSituScanz brain imaging exploration. Geogaia has a 100% biodegradable formula, aligning with Givaudan's objective of achieving a biodegradable fragrance palette by 2030.

Part of Givaudan's Gaia collection, Geogaia features Phytogaia, which is said to offer well-being benefits of molecules emitted by forest trees, and Thalassogaia, designed to mimic the composition of the marine environment, developed according to the company's Naturality Guide principles.

Stéphanie Martin, Home Care Category director shared, "Demonstrating the emotional dimension of this new creation, 81% of consumers observed an 'after the rain' olfactive effect in the compositions containing a significant level of Geogaia, describing a pleasant natural outdoor sensation (Sniff test 2023). Being the most accurate translation of this universally evocative wet weather smell, Geogaia opens new creative perspectives, across all product categories."

p&f+

# IFF Promotes Trudi Loren to Vice President of Global Innovation, Creation and Design, Fine Fragrance

In late April 2023, IFF announced the promotion of its creative director of Fine Fragrance, Trudi Loren to vice president, Global Innovation, Creation and Design, Fine Fragrance. In her new role, Loren will take the helm of the creative and innovation teams of the Fine Fragrance business unit globally.

Valery Claude, vice president, Innovation and Creation, Scent, IFF said, "It gives me great pleasure to welcome Trudi [Loren] to her new role. Trudi [Loren] has demonstrated great success with her expertise, understanding of customers, market savviness, passion for fragrance, and leadership skills since she joined IFF. She will be a fantastic asset to the team and to bring our fine fragrance business to new heights."

In her global role, Loren will continue to build a highly focused creative and innovation team to advance fragrance R&D innovation, delivering inventive and perfumes for the market.

Loren has more than 30 years in the industry and has broad experience working with leading fragrance companies and brand building campaigns for Estee Lauder. In her previous roles, Loren has spearheaded the development of several blockbuster fine fragrance brands around the world. Loren holds a Bachelor of Science in Biochemistry from Boston College. She will be based in IFF's headquarters in New York.



*In her global role, Trudi Loren will continue to build a highly focused creative and innovation team to advance fragrance R&D innovation, delivering inventive and perfumes for the market.*



# dsm-firmenich Confirms Successful Merger and Shares Company Details




*dsm-firmenich executive committee at the stock exchange.*

Just weeks away from marking one year (May 22, 2022) since DSM and Firmenich announced that the companies entered into a business combination agreement, the two have confirmed the successful merger as dsm-firmenich.

Boasting nearly 30,000 employees, dsm-firmenich is aiming to be "a trailblazer in the reinvention, manufacturing, and combination of vital nutrients, flavors, and fragrances." The company has announced its four sectors of business:

- Perfumery & Beauty
- Taste, Texture & Health
- Health, Nutrition & Care
- Animal Nutrition & Health

Geraldine Matchett and Dimitri de Vreeze, co-CEOs of dsm-firmenich commented, "Today marks a new beginning for us all that is the culmination of more than a century of groundbreaking science from two great companies. dsm-firmenich now stands out as a category of one, uniquely working at the intersection between what people individually want and what we collectively need, without costing the Earth. After all, what is essential has limited impact if it is not desirable, and that impact is not positive if it is not sustainable. And sustainable things that people don't want or need don't help much! We are truly global, built on an incredible foundation of proven world-class science with the broadest portfolio of nutrients, flavors, and fragrances. We are delighted to embark on this journey together as a single force for good as innovators in nutrition, health, and beauty."

Matchett and Dimitri de Vreeze, Co-CEOs of dsm-firmenich, added, "We honor the legacy of DSM and Firmenich by taking the best of both companies in creating a fresh, new identity. It's lively. It's vibrant. It's led by our purpose. Just like dsm-firmenich. This is the beginning of an exciting new time for our employees, our customers, and our partners as we go above and beyond in shaping a positive future for all and as we bring progress to life."

Following the completion of the merger, Matchett has decided this is the right time to further her career elsewhere and will move on, as of September 1, in full alignment and with the thanks of the Board of Directors. Dimitri de Vreeze will be the dsm-firmenich CEO.

p&f+



# We'll Save You a Seat for 2023!

perfumer & flavorist

flavorcon®

The Sensory Event for Flavor Leaders

**November 8-9, 2023**
Duke Energy Convention Center
Cincinnati, Ohio

# 2023 Flavor & Fragrance Leaders & Newsmakers

**Executives from some of the most influential F&F companies provide an in-depth look at the last year and provide insight into what's to come.**

Welcome to the Leaders & Newsmakers issue! Over the last year, *Perfumer & Flavorist*+ (*P&F*+) has seen remarkable amounts of acquisitions, production site launches and technology innovations in the F&F industry.

In 2022's edition, companies focused on sharing milestones in sustainability goals. While sustainable practices are still a major concern for the F&F industry, a fair share of headlines has been dedicated to research into the relationship between functional food and fragrance ingredients with the growing consumer interest in wellness in mind. Other notable investments also include discoveries in artificial intelligence and biotechnology.

In late 2022 and early 2023, Firmenich, Robertet and Symrise announced F&F start-up ventures. Firmenich's partnership with Canada-based, fragrance industry venture, Airzai was established to co-create to reinvent fragrance design through augmented creation based on neuroscientific research. Robertet's startup accelerator, Villa Blu—which launched in March 2023—hosts 20 startups simultaneously catering to natural sectors including ingredients, fragrances, food flavorings, as well as health and well-being active ingredients. In early 2023, Symrise began a series A funding round for U.S. beauty incubator Ignite Venture Studio, allowing Symrise to expand investments in beauty/personal care startups, while driving fragrance and cosmetic ingredient innovation. This investment in F&F startups has the potential to lead to the next breakthrough in various industry segments.

As in previous years, *P&F*+ tapped industry leaders and newsmakers to weigh in on their companies' strides over the last 12 months and share their outlook on emerging trends in F&F. All companies are presented here in alphabetical order.

p&f+

> "Investment in F&F startups has the potential to lead to the next breakthrough in various industry segments."



Reproduction in English or any other language of all or part of this article is strictly prohibited. © 2023 Allured Business Media.

Agrumaria Reggina




We are your **trusted partner** for **citrus-based solutions**.
Thanks to our sustainable and circular production cycle,
we offer the best essential oils, juice concentrates,
and ingredients for your **Flavor**, **Fragrance and Beverage creations**.

Discover our citrus world at
**agrumariareggina.it/ourcitrus**

# ADM[a]

**Chicago, Illinois**

**2022 Sales: $4.34 billion**




*ADM is continuing its focus on growth through portfolio expansion and sourcing market data to stay abreast on the latest trends driving innovation.*

ADM has continued to make strides in expanding the company's reach since the 2022 edition of the Leaders & Newsmakers issue. Over the last 12 months the company has acquired South African flavor distributor Conham, debuted two science and technology centers, one in Illinois and the other in China, and created a partnership with New Culture, an animal-free dairy company, to accelerate the development and commercialization of alternative dairy products.

The company is continuing its focus on growth through portfolio expansion, sourcing market data to stay abreast on the latest trends driving innovation and partnerships with key players in the industry. More on that in the coming pages as *Perfumer & Flavorist+* hears from several voices from the ADM team regarding technology innovation, shifting trends and portfolio expansion.

[a]ADM reported profit of $4.34 billion, or $7.71 per share. Revenue was reported as $101.85 billion.

## Marie Wright

President of Creation, Design and Development and Chief Global Flavorist, ADM

### A Legacy of Entrepreneurship and Pioneering Innovation

The global marketplace continues to shift and change, with three enduring trends–food security, health, well-being and sustainability–illuminating the need for continued discovery and solutions. This is defining the global food industry, as well as driving ADM's focus forward. Since day one, we have had an entrepreneurial mindset, and we're committed to advancing innovation as a global leader in nutrition, agriculture and biosolutions. With the spirit of innovation at the core of ADM, we're continually progressing to meet the needs of people around the world today and tomorrow.

Our strategic partnerships and investments focus on creating a better future and food system. As we look back at 2022, we expanded our capabilities and worked with disruptive companies, and this momentum has continued into 2023. Our growth, new initiatives, research, discoveries, partnerships and full-system solutions are all made possible through the strong foundation we have both inside and outside of ADM.

As our portfolio continues to expand, we're targeting new formulation challenges and end product goals, from the crucial sensory experience through new flavor technologies and natural color solutions, to nutrition claims like low sugar or high protein, as well as clean label targets and sustainably sourced offerings. Furthermore, our product development does not exist in a silo. ADM scientists, flavorists, chefs, marketers and our customers all work together to develop products that are moving the needle to provide vital optionality and, ultimately, tailored offerings. This coupled with our global capabilities, cross-functional team collaboration and technical and formulation expertise are the key elements to the differentiation we bring to our customers.

As we build upon a century of continued growth and progress, we're looking to what's next. For example, we're focusing efforts on new technologies to advance the way we work across categories to bring better solutions to the end consumer. The possibilities can include everything from evaluating specific flavor compounds and components to identifying microbial strains and enabling new advancements in alternative proteins and product development. Leveraging technologies and techniques, such as artificial intelligence (AI), supports important optimization through the ability to analyze vast amounts of data efficiently and, through machine learning, optimize product formulation. Ultimately, this will help increase the speed to market for offerings that exceed sensory expectations and are specifically designed to meet the evolving needs of a growing population.



*Marie Wright, President of Creation, Design and Development and Chief Global Flavorist, ADM*



*Leticia Gonçalves, President, Global Foods, ADM*

## Leticia Gonçalves

President, Global Foods, ADM

**Expanded Protein Choices for a Resilient Food System**

The food landscape continues to shift, driven by changes in global consumer needs. We need a resilient food system that can feed more people especially as our population begins to push past the boundaries of what our ecosystem can sustain, increasing risk of food scarcity. The World Food Programme (WFP) estimates that 345 million people in 82 countries are facing acute food insecurity. To meet developing needs for food security, nutrition and sustainability, now's the time to expand the protein ecosystem to offer a range of protein sources, including animal proteins, to bring measurable change and support for people around the globe.

Over the past year, we have built upon our long history in plant and alternative protein solutions to meet global demands, all while considering what is best for the planet. Further investment in our ongoing farmer partnerships to grow plant proteins

through regenerative agriculture practices, in addition to radical collaboration across food technology companies, is setting the foundation for the future of alternative protein.

Throughout 2022 and into 2023, we announced partnerships and sustained ongoing collaborations with the intent to revolutionize what's possible in food. For example, last year, we announced a significant investment to expand our alternative protein production capacity and capabilities, as well as support the opening of a new Protein Innovation Center in Decatur, IL. This is an important step in ensuring we're prepared for the volume of research, creation and innovation that is needed to meet demand for more protein choices that rely on plant-based or novel sources or a hybrid of both. We also announced our partnership with Benson Hill to scale availability of innovative, ultra-high protein soy ingredients, which will help bridge the gap between nutrition, the sensory experience and sustainability in plant-based products.

Our investments span globally, supporting specific regional demands and development needs. We opened a new extrusion facility in Serbia less than one year after our acquisition of SojaProtein, a leading European provider of non-GMO soy ingredients. It represents our dedication to this space and is an excellent example of how we're bringing more locally sourced and non-GMO soy to Europe, as well as origination and extrusion capabilities through the new facility. In early 2023, we also announced our joint venture with Marel to build a state-of-the-art taste and texture innovation center within the grounds of the Wageningen University campus, which is at the heart of the Food Valley in the Netherlands. Once opened, we will have expanded capacity to bring great tasting alternative protein innovation to life, from concept to commercialization, leaning on key collaboration across our expert teams and with our customers.

We're also investing in novel sources and technologies that will help diversify the current protein market. Advancements in cellular agriculture and cultivated meat, precision fermentation and more are the next frontier. Our investments and partnerships in food technology companies, such as with GOOD Meat, as well as Air Protein, Nature's Fynd, New Culture and Believer Meats, are critical to establishing what's next.

Additionally, we have a first-of-its-kind joint venture with Temasek's Asia Sustainable Foods Platform, ScaleUp Bio, providing contract development and manufacturing services for precision fermentation. On top of that, ADM is a leader in fermentation, particularly in North America. Through this technology, we're able to create bio-identical whey or casein protein without traditional dairy operations.

Plus, our collaboration with GOOD Meat is supporting the development of pioneering cultivated meat products. Most recently, we signed a non-exclusive memorandum of understanding with Believer Meats, which will propel the scalability and commercialization of cultivated meat products. With our vast ingredient library and capabilities combined with Believer Meats' cutting-edge cell-cultivation technology, there is substantial potential to bring nutritious and delicious cultivated meat products to the mainstream.

## Ken Kraut

Chief Global Flavorist of Savory, ADM

**Savory Technologies Bridging the Gap**

As the alternative protein space continues to grow, so does the need for savory solutions. Flavor and culinary advancements are important to consumer acceptance, broadening consumers' share of diet to include more alternative protein sources that deliver elevated sensory experiences. We're dedicated to discovery, refinement and innovation of flavor solutions to bring better savory offerings to the table, whether that be for a whole muscle-like alternative or for a global cuisine-inspired ready meal. Each consumption occasion should transport consumers on a journey through multi-dimensional flavor systems for an authentic, impactful and complete eating experience.



*Ken Kraut, Chief Global Flavorist of Savory, ADM*

Our flavor scientists and expert chefs leverage the full extent of our portfolio and technologies, which includes proprietary captive materials and taste modulators. A key component to flavor innovation is the technology leveraged, and we recently expanded our capabilities with our TasteSpark[b] Mouthfeel and Masking flavor modulation technologies. Ideal for alternative protein formulations, in addition to condiments and sauces, our TasteSpark technologies bring in the rich mouthfeel that may be lost in non-animal fat systems, as well as those lower in sugar and salt, while neutralizing potential off-notes from certain plant-based or sweetening solutions. Our taste modulation program provides essential body and enhances flavor, sweetness and saltiness.

Inherent off tastes and aromas are addressed by the use of masking systems, enabling a much cleaner plant-based product base and ultimately helping champion savory flavor systems. Our masking technology is designed to target the taste challenges a certain type of protein presents and what other ingredient interactions may be at play, to help mitigate off-notes. We also tap into the strength of a full pantry of offerings to achieve the best possible flavor solutions. Collaboration is at the heart of this unique holistic approach from the start of the formulation to the finished product, bringing forth flavor generation that far exceeds consumer expectations.

Further, our savory team leverages cooking methods and ingredients to optimize flavors and create distinctive profiles for a wide variety of customer needs. Through our culinary-forward approach, we continue to build a wealth of savory flavor solutions. This includes slow-roasting, smoking, braising or sweating food ingredients in small batches and reducing them to extract specific flavors from each ingredient. Additionally, we have a number of vegan flavor and taste ingredients – evoking meatiness, fishiness and dairy or brown butter-like notes–ready to commercialize across alternative protein categories. Our comprehensive approach and continued research are helping lead the way for flavor innovation, for the savory category and beyond.

[b]TasteSpark is a trademark of ADM



## Mark Lotsch

President, Global Health and Wellness, ADM

**Balanced, Tailored Wellness Backed by Science**

People today are much more in tune with their health and wellness needs, with consumers gravitating toward foods, beverages and dietary supplements that meet them where they are in their current life stage, while also delivering on overall wellness support. This focus on balanced wellness and proactive personalization is shaping the health and wellness space and pushing the boundaries for what is possible for wellness solutions. With the humanization trend in pets, we see similar development in pet nutrition and also in certain aspects for animal nutrition.

A key piece to building tailored health and wellness solutions is the microbiome, and ongoing research demonstrates that the complex ecosystem of the gut microbiome can play a vital role in an individual's overall health and wellness. While there is still much to be explored, we're dedicated to being at the forefront of this research, discovery and understanding.

Our commitment to advancing science-backed solutions, including prebiotics, probiotics and postbiotics, to help enrich the quality of lives for people, pets and animals around the globe is the driving force behind our continued investment and exploration in the microbiome modulation arena. Our global team of scientists and researchers are continually collaborating, uncovering new microbial strains and clinically prove novel possibilities that can expand our horizons for what is possible in health and wellness. This, in addition to our acquisitions, facilities and partnerships, are helping to bring forward-looking functional food, beverage and dietary supplement innovation to consumers today. Notably, we announced the opening of the more than $30 million production facility in Valencia, Spain in February 2023. This is the world's first facility manufacturing both probiotics and postbiotics.

Also crucial to health and wellness innovation are solutions that can withstand different formulation environments, especially as foods, beverages and dietary supplements continue to converge. Postbiotics and spore-forming probiotics represent the future of this space, as they can retain functionality through harsh processing conditions, such as high heat commonly used in beverages, baked goods and snacks, providing the personalized support consumers are demanding. Our acquisition of Deerland Probiotics & Enzymes



*Mark Lotsch, President, Global Health and Wellness, ADM*

continues to represent the strategic expansion of ADM's health and wellness capabilities and expertise, bringing key spore-forming solutions and enzymes into the fold.

As we look to the years ahead, it will take a combination of continued scientific research, novel technologies, further investment, industry collaboration and holistic product development and application know-how to revolutionize the health and wellness arena with accessible, tailored functional solutions that also taste exceptional. The same is true for pet nutrition, supplements and animal nutrition.

## Calvin McEvoy

President, Global Beverages and Flavors, ADM

**Flavor is the Foundation and Always Evolving**

At the crux of all food and beverage creation is flavor. Without it, a crucial part of the consumer experience is lost. As a flavor powerhouse, ADM has been leading the way in sensory innovation, and we continue to think past the conventional to help transform every product category–from beverages to alternative protein applications, snacks, dietary supplements and more.

Consumers are no longer accepting products that may have not delivered a great taste experience, such as many health and wellness supplements or sports nutrition snacks. This is transforming the wellness and active nutrition sectors, and brands must step up to the challenge in order to succeed

with discerning consumers. The sensory experience is also critical to health and wellness solutions beyond just base level enjoyment. Typically, if a product tastes good, people feel good, which in turn may support emotional wellness, as well as adherence to incorporating wellness offerings into daily routines. By tapping into our wider library of solutions, we use our captive ingredients, flavors, colors, microbial strains, botanicals and plant extracts, proteins and more, building enjoyable health and wellness experiences for consumers that also meet their distinct needs.

Markedly, consumers accept flavor experimentation now more than ever, opening the door for exciting flavor possibilities. In fact, we have identified several consumer behavior shifts impacting what's trending in flavors in our 2023 Flavor and Color Trend Outlook report[c]. With an increased interest in discovery, as well as a desire to express themselves boldly through foods and beverages, in addition to the continued search for holistic wellness support, consumers are increasingly captivated by new sensory experiences.

Beverages, in particular, are ideal formats for flavor exploration, and shoppers tend to be more willing to try something new when considering their beverage purchases. Bringing this desire into reality, we announced a partnership with Trackmind in 2022. By combining our flavor and formulation know-how and leading product development capabilities with Trackmind's team of insight experts, storytellers, graphic designers, e-commerce developers and more, we're bringing every aspect of beverage development under one roof. With exemplary packaging and key understanding of consumers' purchasing behaviors, as well as visually appealing colors, exceptional flavors and functional ingredients, we're elevating beverage options for the modern consumer.

[c]*www.adm.com/en-us/news/adm-stories/adm-unveils-flavor-and-color-trend-outlook-for-2023/*



*Calvin McEvoy, President, Global Beverages and Flavors, ADM*

Further meeting consumers' desire for bold experiences in convenient beverage formats, we recently launched our proprietary Corefold[d] citrus technology. Taking a novel approach to concentration, this cutting-edge technology focuses on the core part of citrus oil to emphasize the molecules responsible for both impact and mouthfeel, while capturing the top notes for freshness and aroma.

One of the primary differentiators of our business is ADM's breadth and depth of expertise and capabilities throughout the value chain. We are an indispensable partner to the world's food and beverage companies as we work to nourish a growing population. With our finger continually on the pulse of consumer and market trends, in addition to global needs and events, we're always evolving, looking at what can be achieved today, tomorrow and for decades to come to unlock synergies across ingredients, solutions and companies.

[d]Corefold is a trademark of ADM

p&f+

perfumer & flavorist
The Resource for Sensory & Wellness Innovation
SUBSCRIBE TODAY!
www.PerfumerFlavorist.com/subscribe



perfumer & flavorist®

The Resource for Sensory & Wellness Innovation

# Tune In!



*Perfumer & Flavorist+*

## Multimedia

www.perfumerflavorist.com/multimedia

# BASF

**Ludwigshafen, Germany**

**2022 Sales: €2,447 million[a]**



*BASF is continuing its efforts to be a role model in sustainable practices and products.*

Since making its debut in the Leaders & Newsmakers issue in 2022, BASF has invested in new platforms for customers, reached sustainability milestones and debuted plants in China and Germany.

BASF is continuing to strive to be a role model in sustainable practices and products with efforts to optimize production sites and staying abreast on the evolving regulatory landscape. Three of BASF's top minds join *Perfumer & Flavorist*+ (*P&F*+) to discuss BASF's recent ventures in production as well as sustainability. On the regulatory front, Aroma Ingredients director of Global Regulatory and External Affairs & Quality Compliance Felix Klug, Ph.D., weighs in on the impacts of potential updates on the F&F industry.

[a]These numbers reflect sales data from 2022 in BASF's Nutrition & Health division

## Thilo Bischoff

Senior Vice President, Aroma Ingredients, BASF SE

***P&F*+: What was your company's biggest business accomplishment in the last year?**

Indeed, the BASF Aroma Ingredients business reached new milestones in the past 12 months. In line with our commitment toward growth with our customers, the business has grown to become its own BASF global business unit in 2022. This development reflects the achievements of the past as well as the potential of the business for further growth to support our customers' growth and sustainability ambitions.

In tandem with this development, in March 2023, we announced our investment in the aroma ingredients business with new plants in China and Germany. The investment comprises a new citral

plant in Zhanjiang, China, and menthol and linalool downstream plants in Ludwigshafen, Germany. This investment decision is significant, because the expanded capacity of citral will be a key enabler for BASF to diversify our citral value chain footprint and support our customers' growth opportunities.

In the area of sustainability, we achieved the Lower Carbon Footprint Certification for Geraniol Extra BMBcert[b], awarded by the independent global climate change consultancy Carbon Trust. Reinforcing this recognition, Geraniol Extra BMBcert was also a finalist in Circular Economy Innovation at the 2023 edie Awards, which is the United Kingdom's largest sustainability awards recognizing excellence in sustainability.

To better serve the product development needs of our customers, we introduced the Virtual Aroma Assistants in mid-2022. This is a complimentary service exclusive to our customers. Basically, it is a digital platform comprising three virtual assistants with specialized product, regulatory and sustainability knowledge. For our customers, the digital enablement tool eases the information search process with speed and up-to-date information. For example, our customers are now able to easily seek out the most current regulatory guidelines in specific markets. In the area of sustainability, customers may easily tap on the virtual assistant to request product carbon footprint (PCF) statements comprising the total greenhouse gas emissions from cradle to gate.

***P&F+*: What were your biggest technical advancements for the last year?**

In line with BASF's goal to achieve net zero emissions by 2050, new technologies and approaches are being developed to replace the use of non-renewable resources. We take our commitment to sustainability very seriously and have implemented several measures to reduce our dependence on natural gas and shift towards renewable energy sources. For example, we applied several measures to reduce the dependency on natural gas in our aroma ingredients production in Ludwigshafen. These measures include changing plant equipment; optimizing parameters and process control to reduce the consumption of steam, water cooling, electrical power and raw materials; and using imported raw materials to reduce our dependence on natural gas. Additional measures are currently being implemented to achieve further reductions in energy consumption by 2024. BASF is committed to reducing its carbon footprint and has taken

[b]Geraniol Extra BMBcert is a trademark of BASF



*Thilo Bischoff, Senior Vice President, Aroma Ingredients, BASF SE*

responsibility for reducing $CO_2$ emissions. One example of this commitment is that BASF is building the world's largest subsidy-free offshore wind farm in collaboration with its partners. The wind farm will provide renewable energy to BASF's production sites across Europe, significantly reducing reliance on fossil fuels.

Our commitment to optimize production sites for the future is not only limited to existing plants, but also extends to our new plants in China and Germany. Those are also enabling further PCF reductions, making them a role model of sustainable production in the industry. BASF optimizes resources and creates synergies by integrating the new plants into the Verbund sites in China and Germany. By 2025, the Zhanjiang site aims for 100% renewable electricity, advanced automation, and reduced energy consumption, setting an example for sustainable production, while the Ludwigshafen site benefits from leveraging existing structures and technology. Sustainability and reducing $CO_2$ emissions remain central to BASF's business endeavors in both locations and will continue to drive our efforts towards a more sustainable future.

## Steffen Götz

Vice President, Aroma Ingredients, BASF SE

***P&F+*: What are the key factors/trends shaping innovation in F&F in 2023?**

The flavor and fragrance industry is being shaped by several developments and trends.

Sustainability plays a central role. We recognize the growing need for sustainable products with a leading $CO_2$ footprint, good regulatory profile, improved price-performance ratios, and unique olfactory profile–and this is the basis for our innovation efforts. Our innovative power is based on efficient research and development. We build on the great creativity, the specific skills, and the broad knowledge of about 10,000 employees working in research and development worldwide. In addition, BASF has a large inventory of molecules including raw materials, intermediates, products and side streams that can be used as starting materials for cost-effective scalable products. By combining our strengths in chemistry with the know-how of flavor and fragrance houses and other strategically relevant partners, we can accelerate the development of sustainable fragrance ingredients for the whole industry.

Looking at the sustainability needs of the industry, we understand that our customers are increasingly conscious of the impact their products have on the environment and we are committed to reducing our carbon footprint. We are proud to be among the pioneers in providing transparency on our product carbon footprint. Building on this transparency, we strive to reduce our footprint for all our aroma ingredients by offering more sustainable feedstock choices, increasing the use of renewable energy, continuously improving our production processes and scaling new technologies.

Today our customers can already choose to use renewable feedstock via our biomass balance approach. Last year, we launched our biomass balance portfolio covering almost the entire portfolio of our synthetic aroma ingredients. At the very beginning of the chemical production, renewable raw materials are used to substitute fossil feedstock. The bio-based feedstock amount is attributed to the end product by means of the externally certified mass balance method. This enables our customers to increase their share of aroma ingredients being produced using renewable raw materials in the value chain and to save $CO_2$ emissions.

Our biomass balanced products also address another trend that is gaining importance in the F&F industry–upcycling. The renewable feedstock we use in our production is certified renewable feedstock (e.g. from municipal, agricultural and food waste or used cooking oils) and therefore contributes to using waste or low-value byproducts as feedstock



*Steffen Götz, Vice President, Aroma Ingredients, BASF SE*

to create high-value compounds. By doing so, we help the F&F industry move from a linear economy toward a circular one.

In the flavor industry, natural ingredients are key. We address this need with our Isobionics[c] product portfolio. Our Isobionics products are natural and renewable-based. They are produced with cutting-edge fermentation technology and thereby avoid the challenges associated with extracting aroma ingredients from plants, such as variable purity and weather dependency as well as biodiversity and sustainability challenges in supply chains for natural products. This not only provides customers with reliable and high-quality products, but also supports them to move towards a more sustainable and circular economy. The Isobionics brand is our answer to the growing need for natural flavor ingredients that are high-quality and consistently available according to the customer needs of the future.

At BASF Aroma Ingredients, we are committed to shaping the future of the F&F industry through sustainability and innovation together with our customers and partners. For our product innovation activities, we only pursue new ingredients with a compelling sustainability profile including biodegradability and clean regulatory profiles. By being at the beginning of the F&F value chain, we take responsibility in offering more sustainable options that support the achievement of the industry's ambitious sustainability targets.

[c]Isobionics is a registered trademark of BASF

# Felix Klug, Ph.D.

Director, Global Regulatory and External Affairs & Quality Compliance, Aroma Ingredients



*Felix Klug, Director, Global Regulatory and External Affairs & Quality Compliance, Aroma Ingredients*

***P&F+*: Could you share your insights on the impacts of evolving regulatory updates?**

Among evolving regulatory developments in the world, Europe's regulatory landscape is currently changing more than ever with the upcoming EU Chemicals Strategy for Sustainability (CSS) as part of the EU Green Deal–some might say even more than compared to the introduction of the REACH (Registration, Evaluation and Authorization of Chemicals) chemicals legislation in Europe in 2006. More than 80 regulatory measures are proposed, including a revision of REACH and CLP (Classification, Labeling and Packaging) and developments of concepts on essential uses, mixture assessment, and "safe and sustainable by design" as a guideline for future chemical innovation. The chemicals strategy is intended to enable better protection of human health and the environment from hazardous chemicals to make Europe safer and more sustainable.

We support the ambitious goals of the EU Commission and are fully committed to protecting human health and the environment. We also strive for safe and sustainable fragrances with responsible sourcing, and the F&F focus is already very advanced in terms of safety and sustainability. The innovation and development of new fragrance ingredients is already based on thorough safety analysis focused on the use and application of the ingredient, ensuring that new molecules entering the market will comply with the newest safety standards. We continuously invest in developing innovative new substances and have been steering our portfolio based on sustainability criteria since 2012. We also coordinate within the IFRA-IOFI (International Fragrance Association-International Organization of the Flavor Industry) sustainability team on the most important sustainability aspects for our industry, e.g. carbon footprint, sustainable raw material sourcing, deforestation and biodiversity. Sustainability measures such as reduced carbon footprint by using renewable raw materials as feedstock are also already in place, making the manufacture of fragrances even more sustainable. The concept of life cycle design is already reflected in the design of fragrance ingredients being biodegradable to ensure low environmental footprints. Thus, the safe and sustainable by design concept, which is a core measure within the CSS, is already very advanced within the F&F industry.

However, fragrances could be banned or restricted based on their hazardous properties, whether they cause a risk to human health and the environment or not. Proposed generic bans and restrictions on fragrances in consumer products and the phase-out of substances of concern, even if they pose no significant risk to public health or the environment, could put the innovative strength and competitiveness of European companies at risk while disregarding the benefits fragrances bring to society. For instance, the focus on hazard classes that were handled very safely, e.g. skin sensitization, might not lead to better protection of human health. Scientific data from academic dermatologists shows a downward trend of allergic skin reactions due to improved safety standards for fragrance allergens. Thus, in this context the need for improved risk management is not given. Regulatory decisions should be based on sound scientific data, and chemical risks managed by considering hazard and exposure.

We also support the "no data no market" as well as the "One Substance One Assessment" approach, meaning that collected data on the hazards and risks of a chemical should be shared between different legislations. However, the existence of different legislations has its purpose—every application has a specific form and needs a specific focus. The exposure to humans and the environment is usually very

different in various applications. Taking this into consideration, a horizontal transfer of the proposed and developed measures might not lead to a safer and better regulation. Sector-specific regulations with specific knowledge on applications and their safety are key for safe and sustainable products.

Overall, we support the aims of the EU Green Deal and its Chemicals Strategy for Sustainability. The chemicals legislation in Europe (REACH) is already one of the most protective and comprehensive frameworks worldwide. Thus, we advocate for a science-based and innovation-driven development of the regulatory framework to maintain the competitiveness of the European fragrance industry. A dedicated innovation agenda is needed, as we also see opportunities emerging with the safe and sustainable by design approach as a lever to stimulate innovation and growth. If we want to meet the challenges posed by the CSS as well as the other upcoming transformations that lie ahead of us–climate neutrality, circular economy, and digitalization—a robust "Transition Pathway" is needed that integrates the entire transformation effort of our industry into an overall approach.

> "We support the ambitious goals of the EU Commission and are fully committed to protecting human health and the environment."

p&f+




# Firmenich

**Geneva, Switzerland**
**2022 Sales: CHF 4.9 billion**




*In 2022, Firmenich achieved a second consecutive Platinum sustainability rating from EcoVadis, with a score of 88 out of 100 placing the company in the top 1% of all companies assessed worldwide.*

Firmenich has accomplished an incredible amount of successes over the last 12 months. The following Leaders & Newsmakers' interview was completed prior to the announcement of the dsm-firmenich merger. As the merger continues to evolve, new faces are being appointed to key positions within the company, while others are bidding farewell. As of July 1, 2023, Emmanuel Butstraen will step into the role of president of Perfumery & Beauty, while former president Ilaria Resta will be leaving the company to pursue a CEO position at a prestigious watchmaker company. Below readers can find Resta's insights on the strides made by the Perfumery & Ingredients division alongside fellow Firmenich voices discussing the company's legacy as it looks to a new future.

## Gilbert Ghostine

CEO, Firmenich

During a year of volatility in the market, and economic challenges globally, Firmenich emerged stronger across all segments and maintained a path of double-digit revenue growth. Against this backdrop, we delivered record revenue growth thanks to proactive pricing initiatives, a fluid supply chain, and by maintaining our strong investment in R&D. For calendar year 2022, our revenue exceeded CHF 4.9 billion, our second consecutive year of double-digit organic topline growth. This strong performance reflects our constant investment in growth markets and a strategy centered on innovation and sustainability leadership, enabling agile execution to serve

our customers with the best in fragrance and taste. Above all, we owe our success to my 11,000 colleagues and I thank them warmly for their enduring commitment, creativity, and hard work.

## Investing in Growth Markets

Building on our 30-year footprint there, China continues to generate compelling dynamics that drive future growth opportunities. We moved to majority equity ownership of our strategic partner, ArtSci in China, in 2022, further strengthening our ability to serve the rapidly growing local market and extend our reach across the country.

We have also continued to build strong local alliances in the past year. This included a strategic partnership with HARMAY, a leading retail brand in China, to develop Fine Fragrance through support for new fragrance brands, concepts, and business models. We joined forces with Xun Laboratory to open Villa Harmony, a perfumery studio rooted in Chinese history and culture. This partnership offers an opportunity to connect a unique and valuable perfumery tradition with modernity and creates an avenue for customers to embrace ancestral Chinese culture and techniques.

With the opening of our new state-of-the-art hub for the Middle East and Africa at Dubai Science Park, we are also well-positioned to deliver high-quality and innovative ingredients designed to delight consumers across this strategic region.

## Innovation for Performance and Wellness

Building on our track record of innovation driven growth, underpinned by world-class science and the extensive digitalization capabilities of our d-lab, we have continued to focus on superior performance and continue to drive active benefits for wellness and nutrition.

For the second consecutive year, we were included in the "Innovation Momentum 2023: Global Top 100 report" by LexisNexis, as the only company in our industry to feature in the top 100 leading companies advancing innovative solutions to today's challenges.

Highlights include our sustainable, high-performance technologies for fragrance encapsulation made with 100% biodegradable ingredients. In 2022, we launched PopScent[a] EcoMax fragrance encapsulation which takes creation to the next level with new technologies that maximize freshness and long-lasting fragrances. Driving our successful plant-based protein solutions for diet transformation, our developments in the SmartProteins[b] continuous



*Gilbert Ghostine, CEO, Firmenich*

innovation program feature proprietary solutions across aroma, taste, texture, and salt reduction.

To reinforce our research and development vision and strategy, I am delighted that leading independent scientists have joined our new Scientific Advisory Board. The SAB helps us identify new opportunities through world-class insights into developing fields such as biotech, neuroscience, materials science, artificial intelligence, and health.

## Purpose–Being a Responsible Business

Responsible business is a core part of our values and a source of trust and differentiation for our customers that also aligns with growing consumer consciousness. Enhanced, systematic oversight by our Board of Directors through a new Governance & Sustainability Committee reinforces our commitment to the pillars of our ESG drive: Acting on Climate Change, Embracing Nature, and Caring about People.

Enhancing the credibility of our approach, we became the first company in our industry to receive the Science-Based Targets initiative (SBTi) approval of our net zero emission targets to combat climate change. And we continue to gain recognition for measurable industry-leading performance.

Firmenich was awarded a fifth consecutive triple "A" by CDP for transparency and action on climate change, water security and forestry protection. CDP placed us among just 12 companies that achieved a triple "A" listing in 2022 and we are one of only two companies worldwide that have achieved at least five consecutive triple "A" ratings.

[a]PopScent EcoMax is a trademark of Firmenich
[b]SmartProteins is a trademark of Firmenich

We also achieved a second consecutive Platinum sustainability rating from EcoVadis, with a score of 88 out of 100 placing us in the top 1% of all companies assessed worldwide.

Our people worldwide are at the heart of our success in creation and innovation, so I am particularly proud that we became one of only two companies to be Living Wage certified by FairWage network, a first in our industry. We also resecured global EDGE Move certification for gender equality and reached the highest EDGE Lead certification in Brazil and Mexico for diversity, equity and inclusion, a first in our industry.

This was capped by recognition as one of the World's Most Ethical Companies for the second time by Ethisphere[c], a global leader in defining and advancing the standards of ethical business practices.

[c]Ethisphere is a registered trademark

### Transformation for the Future

In May 2022, we announced our intention to merge with DSM, a move which will accelerate innovation for the industry and generate new growth opportunities for customers. A year later, dsm-firmenich has emerged to form the world's leading creation and innovation partner in nutrition, well-being, and beauty.

This transformation marks the natural next step in Firmenich's evolution, building on our tradition of entrepreneurial excellence, creating a global leader that will be able to bring breakthrough innovation and technologies to our customers, addressing the most pressing needs of consumers. Together, we can share our purpose-led values and create value through our science-based approach and pioneering technologies, making a real difference to people and planet.

All of us are excited that the legacy of Firmenich is shaping a new industry leader that will innovate for a better world.

## Ilaria Resta

President, Perfumery & Ingredients, Firmenich

We have marked an important milestone in our journey to Positive Perfumery as we integrate the Perfumery & Ingredients organization, with Amaury Roquette taking on the role of senior vice president for Ingredients and leading its activities. Our Perfumery & Ingredients capabilities bring competitive and differentiating advantages to our customers, with a unique value proposition that connects innovation and sustainability. Our world-leading palette enables our perfumers to create fragrances with innovative and remarkable perfume ingredients that show our dedication to nature, green science and cutting-edge—from synthetics to naturals, and from renewable to biodegradable.

With this synergy, we will continue to push our vision of Positive Perfumery, driving innovation and creativity to advance the development of delightful and performing fragrances that are also more eco-friendly.



*Ilaria Resta, President, Perfumery & Ingredients, Firmenich*

## PERFUMERY

### Consumer-Driven Innovation

Our deep insights into consumer needs and behavior continue to guide our teams to innovate for our customers. These curated observations enable us to forecast consumer desire, create a mindset shift for teams to envision the future of fragrance, flavor, brands and products, and inspire disruptive thinking. In 2022 saw a dramatic increase in consumer demand for scents


SANTANOL
PURE ETHICAL SANDALWOOD
SANTALUM ALBUM
SANTANOL
OUR PASSION.
YOUR CREATIVITY.
The purest Sandalwood oil, sustainably and ethically sourced by Santanol:
a matchless quality, harvested from our East Indian Sandalwood plantations
in Western Australia, distilled with the utmost care.
AND NOW UNLEASH YOUR INSPIRATION.
www.santanol.com



*Firmenich continues to evolve the company's creation palette with a portfolio of natural and clean label ingredients.*

that go beyond smelling good and we launched EmotiCODE[a], the newest technology under our breakthrough EmotiON program, which brings together proprietary consumer insights from across the world, neuroscientific research, and the expertise of our perfumers. This latest advancement in the field of emotions aids in boosting the attention span of perfume consumers to help achieve a state of flow and concentration Starting with FOCUS—the first patent-pending fragrance design rules demonstrated to give consumers the benefit of improved focus.

Through a combination of olfactive guidelines and fragrance technologies, Firmenich perfumers can create fragrance technology known to have antibacterial and antiviral properties, together with benefits that promote wellness. We continued this unparalleled fragrance experience with PopScent EcoMax, a first-of-its-kind fragrance capsule that maximizes fragrance delight, made with 100% biodegradable ingredients[b].

## Conscious Perfumery

We are witnessing an increase in consumer demand to know if ingredients are biodegradable, renewable, and that the sourcing of natural ingredients respects the environment and supports communities. They want to understand not only what is in fragrances but also where these are from, making transparency very important. In a study we ran in 14 countries in July 2022, 50% of consumers said they feel the climate crisis impacting their daily lives. They want to make a difference and are eager to find solutions.

Biotechnology is gaining significant traction and our production processes are among the greenest in the industry, resulting in groundbreaking ingredients that are predominantly natural and 100% renewable. Among our biotech ingredients, Z11—a sensual dry woody note with an elegant ambery facet—celebrated its fifth anniversary. Firmenich was the first to introduce biotechnology ingredients in perfumery in 2014 and we continue to invest in applied research and ingredient introductions in this field. Recently, we launched Casmiwood[c],

[a]EmotiCODE is a trademark of Firmenich

[b]All the components of the polymer wall are readily biodegradable or naturally sourced materials. Natural-origin as defined by ISO 16128.

[c]Casmiwood is a trademark of Firmenich

a new woody synthetic ingredient for perfumery. This builds on our unique base in R&D and innovation as we push forward in pioneering our day-to-day research from synthetics, based on green chemistry, to naturals, and from renewable to biodegradable ingredients.

As we continue to transform to more biodegradable and carbon efficient ingredients, we need to guide our creators to design more conscious fragrances to help us reach our ESG 2030 ambitions. We introduced our Ecoscent Compass[d] Next Generation tool, which now comprises 45 fragrance claims and 20 ingredients claims, to support our clients' evaluation of their creations, make enlightened decisions and help them reach their sustainability goals.

### The Future of Fragrance

Digitalization has been moving at lightning speed and 2022 saw much advancement in this field. We are preparing for a future where technologies will turn fragrance into digitally translatable entities. Through sensorial products and experiences, our sense of smell will become a part of the digital world. Last February saw the world premiere of "The Art and Sound of Scents" at the renowned artgenève show in Geneva, combining fragrance, images and live music for a unique multi-sensorial experience.

ScentMate[e], the online co-creation platform, recently celebrated its first-year anniversary with expansion to new territories. As the first digital fragrance house that can turn a creative idea into a winning fragrance in just a few clicks, this innovative business model provides a forward-thinking form of collaboration between clients, perfumers and experts on consumer insights to co-create bespoke fragrances.

Our digitalization programs include the launch of the Studio platform for our clients and a new collaborative platform, powered by advanced algorithms, for development and product selection. We are also continuing to provide market-leading insights into the future of fragrance.

[d]Emocent Compass is a trademark of Firmenich

[e]ScentMate is a trademark of Firmenich

## INGREDIENTS

### Robust Growth in Ingredients

In Ingredients, we continued to achieve strong momentum with robust revenue growth in 2022 across our product lines. Ingredients outperformed the industry and gained market share in our core markets, notably in Europe and Asia. We benefit from our vertically integrated offering and local supply, close to key customers, and our strength in renewable and natural ingredients provide us with a competitive advantage. Our agile execution has enabled us to constantly innovate, optimize our product portfolio and improve our asset and equipment reliability.

### Further Investing in our Assets

Further strengthening our presence in the strategic Europe and North American markets, we increased our production capacity in the United States for Habanolide[f], our high performance and best-selling iconic musk, and we are launching a major project to also manufacture it in France. Our carbon footprint will be substantially reduced by locating production close to the markets in Europe.

The year was also marked by the expansion of our Global Innovation Center for Natural Ingredients in Grasse with the inauguration of brand-new premises for our people, allowing the historic site to function entirely as an industrial tool.

### Pioneering and Differentiating Ingredients

In Naturals, we ramped-up our unique Firgood[g] collection obtained by a revolutionary, sustainable proprietary extraction technology with our latest addition, Lavandin Pays Firgood. This new ingredient completes our brand-new range of pure, 100% natural extracts which are produced in our Naturals Center of Excellence in Grasse. Designed to create a differentiating natural signature, our Firgood ingredients range has been a success with new significant customer wins in the first semester, including the latest perfume Fame by Paco Rabanne.

Nine of our most esteemed and traditional natural ingredients, such as Mimosa, Rose Centifolia, Hay and Clary Sage, have been certified with the Geographic Indication "Absolue Pays de Grasse." The label recognizes the region's historic contributions and know-how in perfumery raw material cultivation and industrial processes. It provides transparent

[f]Habanolide is a trademark of Firmenich

[g]Firgood if a trademark of Firmenich

benefits to our customers and their consumers by guaranteeing traceable quality and excellence. It also brings security to local producers who continue to set forth the traditions of Grasse, a UNESCO World Heritage Site.

### Upcycled RE:New Collection

We launched a collection of 10 renewable and upcycled Ingredients derived from pine trees in the floral and woody olfactive families. These products are powered by Sylvergreen[h], our cutting-edge innovation platform to drive transformation towards renewable ingredients.

Addressing the necessity to reduce and, in time, fully stop the perfumery industry's reliance on fossil fuels, we aim to convert existing essential fragrance ingredients, obtained through petrochemistry, into renewables derived from renewable carbon sources without any olfactive compromise. This is achieved by using more sustainable alternative technologies and guided by green chemistry principles.

### Sustainable and Ethical Value Chain

Firmenich is committed to operating the most traceable, sustainable and ethical value chain in the industry, from farmer to final product. With our own suppliers, we are implementing a transparent supply chain, in accordance with our Responsible Sourcing Policy, to have a positive and measurable impact on climate, nature and people.

Since 2021, we have been partnering at a global level with the Union for Ethical BioTrade (UEBT), which is recognized for setting the most demanding standards in responsible sourcing. Our Indonesian Patchouli has been verified as responsibly sourced by UEBT. This acknowledges the excellent work performed by our teams to economically empower the 850 patchouli farmers we work with in the region, help preserve local biodiversity, and adapt to climate change.

### Leading the Way in Ingredients

We have built the leading platform of innovative and sustainable ingredients. In addition to offering the natural ingredients portfolio, we maintain a leadership position as number one in Synthetics guided by green chemistry principles and practices. We are also number one in renewable ingredients made from upcycled products. Fifty percent of our ingredients palette is manufactured from renewable carbon sources, the highest proportion in the industry, with the aim to achieve 70% by 2030.

[h]Sylvergreen is a trademark of Firmenich



*Maurizio Clementi, ad interim President, Taste & Beyond, Firmenich*

## Maurizio Clementi

ad interim President, Taste & Beyond, Firmenich

Throughout the year, we have remained committed to accelerating the consumer-led global diet transformation by helping to create healthier, affordable great-tasting food and beverages with more natural and sustainable ingredients.

### Transforming into Natural

We're committed to sustainably deriving the best from nature with the most positive impact. Our Naturals Transformation ambition answers the consumer demand for more natural and less-transformed products with a better impact on the environment. We are doing this through sustainable procurement standards, collections of certified ingredients with strong involvement at source, and constant innovation.

We continue to expand our ability to measure our sustainability footprint with new proprietary digital tools which provide our customers with value chain transparency, as increasingly demanded by consumers. We continue to evolve our creation palette with a portfolio of natural and clean label ingredients, constantly improving technology to deliver authentic natural and clean label flavor, while minimizing the crop yield required to do so.

Through our encapsulation expertise, we continue to serve customer needs around cost,

[i]Infusarome is a trademark of Firmenich

legislation and functionality by providing flavor protection against processing conditions or the ambient environment. As a part of our encapsulation innovation program, this year we launched Infusarome[i], a unique technology delivered on a natural tea base which allows for fresh, authentic flavors and cost savings with perfect homogeneity, produced via our patented low impact process aligned with our ESG goals and sustainability mission.

Additionally, with the orange oil market under severe pressure and volatility due to crop shortages, environmental challenges and transportation instability in recent years, we recently launched a new range of high performing orange solutions—NextGen orange extenders and replacers—natural and sustainable alternatives to orange oils which achieve a taste equivalent to orange flavor.

## Plant-based Revolution

We continue to grow our capabilities to serve the ongoing consumer shift toward more plant-based alternatives to meat and dairy products with better-tasting and more diverse analogs through our SmartProteins continuous innovation program. Strongly supported by our Campus proteins expertise, we differentiate in the plant-based space through our integrated approach to improving the overall eating experiencing through SmartProteins proprietary solutions across Aroma, Taste and Texture.

In order to create even more regionally relevant plant-based analogs, we recently launched our first Best in Class (BIC) Milk, our first portfolio of consumer-preferred flavors targeting plant based dairy analogs crafted via our unique consumer-first Informed Creation process. Ensuring authentic dairy-like eating and drinking experiences that meet local consumer expectations is essential to creating winning plant based analog products. We designed our (BIC) Milk flavor solutions to mask the off notes of plant proteins while also adding the recognizable typicity of local dairy flavors based on consumer preferences for actual milk notes from locally sourced dairy milks. To achieve this, we used Informed Creation[j], an iterative process based on local sensory and consumer insights in order to ensure perfect alignment with unique local consumer expectations. Our innovation team then further optimized and validated our new flavor solutions to ensure they perform in different protein types.

## Better Nutrition, with Less Sugar, Less Salt and Less Alcohol

At Firmenich Taste and Beyond, we're committed to helping consumers transform their diets with healthier food and beverages that taste great. To support this journey, we have committed to reducing up to 2.8 trillion calories from the sugar in people's diets annually by 2030 (240% leap vs. 2020).

Expertise in sugar reduction takes time to develop—and our teams have the experience, technical expertise, and tools to unlock the possibilities for great tasting, sugar-reduced products that consumers seek! We are the sugar reduction leader in portfolio, IP, and innovation.

We continue to make great strides in innovation focused on the growing market trend towards well-being and moderation. Accordingly, we continue to develop finished flavors that maintain organoleptic performance in low and no and alcohol beverages, including beers, ciders and spirits. We have developed a large palette of optimization tools to address taste. To serve this need, we have focused on developing versatile flavor keys that provide depth and authentic taste to brewed beer bases.

In October, we launched our BeeR'Evolution range. The result of extensive sensory studies mapping out the complex taste directions of the most popular global beers, BeeR'Evolution's proprietary modular approach to these flavor solutions enables them to be used stand-alone for full integration into no or low alcohol beer.

We are always striving to enhance our consumer insights, creation and application expertise and constant innovation by elevating and adding more value in our customer partnerships. In August, we opened our U.S. West Coast Taste & Beyond Pilot Plant. The modern facility hosts a full range of capabilities and state-of-the-art equipment designed to increase collaboration, accelerate product development and speed to market by preparing customers for scaled-up production. The Anaheim, California-based Pilot Plant is located at the long-standing home of our West Coast commercial business and newly designed Innovation Center.

[j]Informed Creation is a trademark of Firmenich



# Givaudan

Givaudan
Human by nature

**Geneva, Switzerland**
**2022 Sales: CHF 7,117 million**



*In 2022, Givaudan was recognized for its global leadership in supply chain engagement with a place on the CDP Supplier Engagement Leaderboard.*

The year 2022 was marked by successful navigation of external challenges and finding opportunities to continue growing with customers and deliver sustainable value creation for all stakeholders. Givaudan says the results are a testament to the company's strong client relationships and ability to help deliver superior products loved by consumers.

Now in the second year of its new five-year strategy cycle "Committed to Growth, with Purpose," Givaudan delivered solid business performance including good top-line growth and stable profitability despite challenges ranging from supply chain constraints, inflationary pressure and higher energy prices because of the war in Ukraine. They were able to compensate for input costs and inflationary effects and expanded the business organically.

In 2022, while the pandemic became less of a concern in most parts of the world, new challenges emerged in terms of the external environment. Like the rest of the industry, Givaudan experienced large raw material cost increases, supply chain disruptions leading to rising costs of transport and freight as well as higher energy costs. While the external environment is likely to remain challenging, the company is keeping its focus on being the creative partner of choice for its customers and on making further progress towards 2025 strategic objectives.

The industry leader's 2025 strategy is to shape the future of food, fragrances, and beauty by consolidating its position as the innovation and co-creation partner of choice for its customers. The strategy builds on past achievements and reflects continuing global megatrends and rapidly changing consumer behaviors. The broader global macro themes and trends that motivate the strategy—health and wellbeing, naturals and plant-based proteins—continue to drive the business and offer opportunities for more profitable growth, even in a tough economic environment. Customers remain at the heart of the strategy, which entails ambitious financial targets but also, for the first time, non-financial targets.

These targets promote Givaudan's purpose ambitions in the areas of creations, nature, people, and communities. They include doubling the business

through creations that contribute to happier, healthier lives by 2030, becoming climate positive before 2050, becoming a leading employer for inclusion before 2025, and sourcing all materials and services in a way that protects the environment and people by 2030.

Givaudan has addressed the changing landscape of the industry through a focus on customized, high value-added solutions for customers, helping them differentiate their brands with consumers. The company has also enhanced their capabilities with digital technologies for better offerings and more efficient reach. This growing digital expertise is opening new avenues for innovation in the creation process, helping Givaudan reach new customers and respond with agility.

The company strengthened its use of biotechnology to contribute to its own sustainability journey, to help customers meet their own goals and respond to consumers' emerging preferences for more sustainable products. Givaudan also continues to integrate circular approaches like upcycling, allowing them to rethink how they source, access, develop and invent ingredients for their portfolio and creative palette. Being at the forefront of this sort of innovation remains key to driving growth and is complementary to pursuit of their bold purpose and sustainability ambitions.

## Business Accomplishments

Three core growth drivers power Givaudan's current strategy— expanding the portfolio, extending customer reach and implementing focused market strategies, all of which help create value and positive impact for the company's stakeholders, the economy, environment, and society overall. These drivers are supported by four growth enablers in Creations, Nature, People and Communities as well as by a focus on excellence, innovation and simplicity.

In 2022, highlights in terms of growth drivers included the acquisition of DDW to create the broadest palette of natural colors ever and completion of the purchase of 48% of the Nanovetores Group to strengthen encapsulation capabilities. A strategic collaboration with LanzaTech will enable the development of sustainable fragrance ingredients from renewable carbon, while a commercialization agreement with Fiberstar for a new citrus-based texturizing agent will help expand plant-based texturizing ingredients to new markets.

To extend customer reach, the company opened a new Consumer & Sensory Insights (CSI) center in Johannesburg, South Africa and inaugurated their first integrated fragrance encapsulation center in Singapore, underscoring the company's commitment to the Asia-Pacific region.

Digital innovation remains a key enabler of its 2025 strategy which led to the development of Taste & Wellbeing's Customer Foresight futurescaping platform to leverage big data, artificial intelligence (AI) technology and Givaudan's expertise to meet future consumer's needs. Collaboration with Tmall Innovation Centre (TMIC) resulted in the launch of the fragrance industry's first AI-powered fragrance co-creation service in China.

## Gilles Andrier

CEO, Givaudan

"The second year of Givaudan's new strategy cycle was marked by a 'good set of results' in an external environment that turned out to remain difficult, with new challenges and opportunities," said CEO Gilles Andrier. Citing the company's solid sales growth, he noted that Givaudan had demonstrated its strong focus on execution, supporting the growth of its customers, while leveraging innovation capabilities to introduce innovative solutions that further strengthen market leadership position in chosen markets.

"We are very pleased with our performance in 2022, despite the challenging operating environment that we have operated in throughout the year," he said. "We have indeed been facing an unusual number of adverse external circumstances. In this perfect alignment of headwinds, we have demonstrated



*Gilles Andrier, CEO, Givaudan*

our ability to focus on supporting the growth of our customers; our natural hedges across clients, geographies and product segments; and our ability, in collaboration with customers, to compensate the sharp increase in input costs over 2022 and 2023."

"In the second year of our 2025 strategic cycle, I am proud of all that we achieved," he said. "We have effectively implemented our strategy across our growth drivers and enablers and the key themes we identified have proven to be the right ones. Overall, our business was resilient, and we made substantial progress on our 2025 ambitions."

At the end of the first quarter of 2023, Andrier said while the challenges experienced in 2022 will continue, at least over the near term, the company is confident in its strategic plans.

The CEO added, "We have the right foundations in place to continue growing with our customers as we head into the third year of our 2025 strategic cycle."

## Sales Performance

Large increases to the cost of raw materials, supply chain restraints that led to increasing costs of transport, freight and logistics, and the war in Ukraine that resulted in significantly higher energy costs, placed significant pressure on the operating environment. Still, implementing price increases in collaboration with customers allowed Givaudan to fully compensate for the increases in input costs. Ensuring good cost discipline across the business also contributed to solid results.

Givaudan achieved sales growth across all product segments and geographies. Full year 2022 sales were CHF 7,1 billion, an increase of 5.3% on a like-for-like basis and 6.5% in Swiss francs when compared to 2021. The company further demonstrated strength in the first three months of 2023 with recorded sales of CHF 1,773 million, an increase of 3.6% on a like-for-like basis and a decrease of 0.4% in Swiss francs. The company achieved good business momentum while maintaining operations and the global supply chain at an elevated level despite continued challenges from the external environment.

"I am extremely grateful to all Givaudan employees around the world for their continued commitment to deliver industry-leading performance," Andrier said.

## Sustainability: Concrete Commitments

Givaudan is among the companies making concrete commitments to becoming climate positive, increasing diversity, and protecting both the people and the environment in its supply chains. In 2022, the company was able to accelerate progress towards its longer-term ambitions in these areas.



*Louie D'Amico, President, Taste & Wellbeing, Givaudan*

In 2022, Givaudan was recognized for its global leadership in supply chain engagement with a place on the prestigious CDP Supplier Engagement Leaderboard. CDP's Supplier Engagement Leaderboard recognizes the companies that received the highest ratings in CDP's Supplier Engagement Rating (SER), a measure of how effectively companies engage their suppliers on climate change. CDP assesses performance on supplier engagement using a company's response to selected questions on governance, targets, scope 3 emissions, and value chain engagement in the CDP climate change questionnaire.

The inclusion in the CDP Supplier Engagement Leaderboard followed Givaudan's fourth consecutive CDP double-A rating for leadership in climate action and water stewardship. Givaudan was also shortlisted for an RE100 Enterprising Leader award in recognition of its efforts toward a commitment to 100% renewable electricity by 2025.

## Louie D'Amico

President, Taste & Wellbeing, Givaudan

"Though the business environment was complex, it was an exciting year for Givaudan," says Louie D'Amico, president of Taste & Wellbeing (T&W). "Aligned with our 2025 strategy ambition to shape

# Creating with purpose



Givaudan

Human by nature

the future of food by becoming our customers' co-creation partner of choice, in 2022, we continued to strengthen our extensive portfolio as well as our global footprint and advancing our digital transformation. Our initiatives and activities in these areas ranged from launching new digital platforms to new technologies for Health & Nutrition and Proteins to the ground-breaking at a cellular agriculture hub."

## Business Accomplishments

A key part of Givaudan's long-term strategy, digitalization is rapidly transforming the food and beverage industry. The company's Customer Foresight platform aims to anticipate tomorrow's challenges and future consumer expectations. This futurescaping platform, launching in 2023, is an industry first that leverages big data, AI technology and Givaudan's deep expertise. This platform offers a uniquely, personalized level of digital support in our quest to co-create food experiences with customers and meet the ever-changing needs of consumers.

D'Amico said the company also made significant strides in its commitment to food systems transformation by breaking ground on two centers dedicated to meat and dairy alternatives. The Cultured Hub, created in partnership with Bühler and Migros to accelerate the development and market penetration of cellular agriculture products, is being built near Zurich and will open later in 2023. Givaudan's Tropical Innovation Lab in Brazil, built in collaboration with Bühler, Cargill, FoodTech HUB Latam and ITAL, will allow local companies to connect and develop sustainable future food and beverage products. Finally, in Johannesburg, South Africa, Givaudan's new Consumer & Sensory Insights (CSI) center will support customers by unlocking evolving consumer needs, local differences and sensory experiences, all with the goal of creating food experiences consumers love.

In terms of technical advances and acquisitions, D'Amico points to significant strides in building Givaudan's color portfolio, along with advances in the areas of plant-based and culinary innovation, and health and nutrition. Acquired in December 2021, the integration of DDW, the Color House, into the portfolio has been a key accomplishment over the past year. Expanding the natural color offering allows Givaudan to support our customers in the creation of multi-sensorial food experiences with more color than ever.

## Major Milestones

When it comes to ingredient innovation, Givaudan highlights two major milestones over the past year. Launched in 2022, the PrimeLock+ ingredient delivers juiciness to plant-based meat experiences while helping to reduce fat and garnered an International V-label Award and a Manufacturing Industry Excellence Award from Gulfood in 2023. Givaudan also launched the culinary program Culinary Notes, which recreates at scale the original taste of local recipes with just the right culinary touch. A pillar of this program, their sustainable reaction flavor technology, enables the company to accurately deliver chef flavor profiles in consumer product lines using both less water and less energy. Finally, in Health & Nutrition, the company continues to address consumer demand for nutritious food experiences that promote both physical wellbeing and mental health. The microbiome space is one area where both demands can be met with a single ingredient. With the acquisition of the OatWell[a] brand, the company has consolidated its historic expertise and positioning in oats while breaking into the rapidly growing microbiome space. This innovative and sustainably sourced prebiotic fiber promotes gut health while also delivering the well-known nutritional and cardiovascular benefits of oats.[1,2]

At the end of 2022, Givaudan had:

- Over 16,600 employees
- 166 locations worldwide in 52 countries
- 65 creation and research centers

## External Pressures

Socioeconomic pressures, including the impact of inflation and war are having an enormous impact on the food industry. Value is being redefined as a result and consumers are increasingly focused on affordability and value for money.

"But this focus hasn't slowed the overall shift towards an experience economy," D'Amico says. "As consumers are now seeking out experiences rather than just products, we need to address all aspects of that food or beverage experience."

There is also growing awareness of the need to address climate change. Much of Givaudan's work focuses on transforming food systems for a more sustainable future. This includes ingredient innovation through biotechnology and solutions for creating satisfying plant-based food experiences. In 2022, they helped reduce over six million tons of $CO_2e$ from consumers' diets.

[a]OatWell is a trademark of Givaudan

## Looking Ahead

Continuous digitization and AI are now becoming a part of our everyday lives, D'Amico says. "Using these tools and developing new ones will be crucial in order to stay ahead of new trends and develop products that meet the changing demands of the market."

Health and wellbeing also continue to be a major focus for consumers. According to the Innova Trends Survey 2022[b], 41% of consumers around the world believe that health should be the key driver behind product development, followed by affordability and naturalness. This has led to an increased focus on bringing health and nutrition to mainstream food and beverage experiences.

Finally, with regulators worldwide introducing new legislation to keep pace with innovation, harmonization is one of the most important considerations for industry success. D'Amico has served as president of the International Organization of the Flavor Industry (IOFI) since 2020 and in recent years, IOFI has been instrumental in helping to establish global flavor standards and harmonize regulations around the world. This makes it easier for companies to develop and market products across different regions and to assure product safety for consumers.

"Worldwide, regulatory updates are changing the market landscape when it comes to meat and dairy alternatives. They have also meant more stringency and transparency around consumer health," D'Amico says.

For meat and dairy alternatives, the approval of cell-cultured products by the U.S. FDA has marked a key milestone for the category. This year, two companies—Upside Foods and Good Meat—received "no questions" letters from the FDA, paving the way for the commercialization of cell-cultured meat. Japan is also moving in a similar direction, with the government making plans to assess the safety of cultured meat and seafood and create guidelines for their production and sale.

With existing products, there has been an increased focus on labelling requirements centered around consumer health. This includes initiatives such as NutriScore in Europe, warning labels in Mexico, as well as new FDA guidelines for "healthy" claims. These requirements coincide with the increased focus on consumer wellbeing, with sugar being increasingly scrutinized. This has left manufacturers searching for sugar-reduction solutions that also offer a consumer-friendly label, an area that Givaudan pioneered over 15 years ago.

[b] *https://www.innovamarketinsights.com/webinars/top-ten-trends-for-2023/*



*Maurizio Volpi, President, Fragrance & Beauty, Givaudan*

# Maurizio Volpi

President, Fragrance & Beauty, Givaudan

Maurizio Volpi remains positive about the outlook for fragrance and beauty overall, despite the challenges arising from the overall macro environment. The company's strengths lie in ingredients innovation and development of the perfumer's palette with the best, safest and most sustainable molecule innovation. "Responsible innovation allows us to grow with our customers in a sustainable manner," he says.

## Business Accomplishments

Sustained robust performance of Fine Fragrances and Fragrance Ingredients drove this year's good growth, Volpi said, as did the return to good growth momentum in the Consumer Products business towards the end of the year. Performance was supported by the increased impact in the second half of the year of the pricing actions implemented with customers to compensate for the increases in input costs.

In 2022, the company introduced AmbreXolide[c], a sustainable alternative to the widely used musk Ambrettolide. Designed following the principles of green chemistry and in line with the company's FiveCarbon Path[d] sustainability vision, it is a naturally derived and biodegradable molecule. Combining microencapsulation technologies with

[c] AmbreXolide is a trademark of Givaudan

[d] FiveCarbon Path is a trademark of Givaudan

active ingredients allowed for the creation of the sustainable microencapsulated hyaluronic acid Spherulite HA Ultimate that also supports goals of souring at origin: the natural origin content of the products is 100% according to ISO 16128.

Givaudan's best-in-class technologies for counteracting malodor and understanding how smell and taste affect and can benefit consumers also allows Fragrance & Beauty to promote health and wellbeing, Volpi says. In 2022, the company bolstered MoodScentz[e] with MoodScentz[f]+, a fragrance and oral care flavors design program that redefines the understanding of the consumer's emotional experience with a new neurosciences measurement capability. MoodScentz+ allows perfumers and oral care flavorists to create compositions that positively enhance emotions and positive moods such as Relax & Unwind, Invigorate & Recharge and Happy & Blissful.

Givaudan moved to maximize its Naturals portfolio through upcycling, a technique that allows for both a positive environmental impact as well as an extension of the range of olfactive facets of the perfumer's palette. Givaudan commercialized Patchoul'Up[g]—a 100% upcycled active ingredient crafted through green fractionation from distilled patchouli leaves after use as a raw material in fragrance creation—in 2022. There are an additional 150 upcycled materials in the palette, with some exclusive upcycle naturals developed internally.

## Fragrance encapsulation

In a move fully aligned with its high growth markets expansion objective, Givaudan inaugurated its first fragrance encapsulation center in Singapore, completing a five-year investment program of CHF 30 million.

"Having all our encapsulation facilities in the same location will sustain innovation, operational reliability and internal agility," Volpi said. "This allows us to further support our customers' growth."

The center unifies the company's competencies in encapsulation to further support the development of delivery technology to meet consumer demand for long-lasting fragrance experience in numerous product categories.

Givaudan will also benefit from strengthened capabilities for active cosmetic ingredients with the acquisition of 48% of Nanovetores Group and the strategic collaboration with LanzaTech to enable the development of sustainable fragrance ingredients from renewable carbon.

[e]MoodScentz is a trademark of Givaudan
[f]MoodScentz+ is a trademark of Givaudan
[g]Patchoul'Up is a trademark of Givaudan

At the end of 2022, Givaudan had:

- A procurement spend of CHF 4.2bn
- 2,900 raw material suppliers in more than 100 countries
- 14,400 additional global partners supplying indirect materials and services

## Increasing Care for Nature and Communities

Looking ahead, Volpi says that people from all walks of life increasingly want to enjoy fragrance produced with care for nature and the local communities who provide the ingredients.

"We are leading the way in making perfume more sustainable and making sure that can meet consumer expectations for responsibly produced fragrances," he says. "In the future, we will continue to push the boundaries of biotech, creating new sustainable innovations for a better beauty future. Givaudan now has the widest offering of biotech cosmetic ingredients on the market. "They represent unique added value in addressing customer expectations for innovative, sustainable and efficient beauty solutions."

## Evolving Regulatory Framework

The European Chemicals Agency's new microplastics safety regulation has already affected the industry and is clearly shaping the development of future products. Givaudan says it is well prepared, however, having already delivered to market the first biodegradable polymer, PlanetCaps[h], for use in encapsulated fragrances capable of meeting the new regulation.

More generally, the company, in its commitment to regulatory compliance, reviews changes of legislation in all geographical regions where it does business, actively engaging in advocacy via different local industry associations to learn about new or upcoming changes in legislation as early as possible. This allows Givaudan to assess the impact on the existing portfolio but also to examine products in development, helping them to remain in compliance and minimize the impact on existing products.

Givaudan's regulatory expertise allows the company to provide essential advice to customers, also ensuring that products meet or exceed all requirements.

[h]PlanetCaps are a trademark of Givaudan

perfumer & flavorist®

The Resource for Sensory & Wellness Innovation




## PerfumerFlavorist.com

Access the digital magazine, business solutions, industry trends, webcasts, podcasts, videos, educational tips, and more.

## *Perfumer & Flavorist* + Daily Newsletter

Get the latest on ingredients, new products, innovation, and breaking industry news.

## Facebook, Instagram and LinkedIn

Follow *Perfumer & Flavorist*+ to join the conversation.

Subscribe to *Perfumer & Flavorist*+ for FREE today!

go to www.PerfumerFlavorist.com/subscribe

# Iberchem

**Murcia, Spain**
**2022 Sales: €250 million**




*Over the last 12 months, Iberchem rolled out innovations to amplify ingredients and research methods to scientifically evaluate the impact of fragrance.*

The Iberchem Group, part of Croda International Plc., reported historic record sales of €250 million, representing a 21% increase year-over-year. Over the last 12 months, Iberchem rolled out innovations to amplify ingredients and research methods to scientifically evaluate the impact of fragrance on human psychology and physiology.

Just this year, Iberchem launched Vita digital assistance tool designed to provide precise naturality data to accelerate the development of natural fragrances according to ISO16128 standards. The group also debuted its Wavemotion neuroscientific investigation program designed to unveil insights into how scent can influence positive neural responses to transform the emotional landscape of consumers and elevate consumer well-being. More insights to come from the voices behind the success and innovation in the interview to follow.

## Robert Cabal

Fragrance Director, Iberchem Group

**What was your company's biggest business accomplishment in the last year?**

Achieving business objectives is something that Iberchem has always excelled at, but year by year it has become more and more complicated. This year we have reached sales figures of €250 million, a record that seemed very difficult to achieve a few years ago. Today we are happy to be able to celebrate this achievement, because apart from Tier 1 companies, there is no Tier 2 company that comes close to these figures.

In addition, this figure was accompanied by a profitability margin above the average for the F&F sector and, considering it was a difficult year due to the increase in raw material and logistics costs, maintaining these profit levels was another great achievement.

**What were your biggest technical advancements/ key acquisitions for the last year?**

The main technological breakthrough in 2022 was the development of biodegradable encapsulated fragrances, Vernovacaps[a], which we launched to expand our portfolio of sustainable and long-lasting fragrance solutions.

We have also launched Wavemotion, a neuro-science research program to scientifically test the wellness effects of our fragrances in all fine fragrance, home care and personal care applications. This will enable us to launch fragrances with proven wellness benefits, and we expect to see the first results in 2023.

**What are the key factors/trends shaping innovation in F&F in 2023?**

In fine fragrances, niche fragrances remain the key to meeting and responding to customer demand. Home Care continues to focus on highly competitive fragrances, especially for the private label sector. In personal care, the trend is different, with the search for products with claims of sustainability, naturalness, wellness and Gen Z continuing to be an important part of these trends.

**Could you share your insights on the impact of changing regulatory updates?**

It is increasingly customized by geographical area and the list of raw materials is more limited. This has helped us considerably because it has forced us to



*Robert Cabal, Fragrance Director, Iberchem*

triple the size of our regulatory department, which has also allowed us to enter markets where this aspect is very complex, due to the legislation being focused at customer, as well as country, level.

Some customers have their own legislation, such as global companies like Henkel, which features us on their core list of fragrance suppliers, and also companies that manufacture for very demanding European markets in terms of legislation, such as Germany, Poland and Korea.

aVernovacapsa is a trademark of Iberchem


TOURNAIRE
Protecting the essential since 1833

For nearly two centuries, Tournaire has supported the perfume and aroma industries. Thanks to Tournaire's monobloc aluminum packaging, perfumers around the world safely store and transport their essential oils, compositions and other aromatic specialties. From a few grams to 25 kilograms, with narrow, wide or full openings, the complete range of Tournaire bottles allows you to store and ship all liquid or solid aromatic products with a total peace of mind.

CONTACT US :
tournaire@tournaire.fr
+33 493 09 34 34



TOURNAIRE PACKAGING PROTECTS THE MOST SENSITIVE MATERIALS SINCE 1833

USA SUBSIDIARY ELEMENTAL CONTAINER ALUMINUM PACKAGING TOURNAIRE

ASIA PACIFIC SUBSIDIARY TOURNAIRE ASIA

WWW.TOURNAIRE.FR
+33 493 09 34 34 contact@tournaire.fr
70, route de la Paoute - Le Plan - CS 71004 - 06131 Grasse Cedex - France

## José Balibrea

General Manager, Iberchem Group

**What was your company's biggest business accomplishment in the last year?**

Excellent growth last year reaching €250 million revenues as milestone. Growth in all categories and markets, including Parfex, leading the more French oriented perfumery from Grasse. Even more important the right foundation of the future growth for our 2027 business model. Thousands of initiatives in action to increase our market share, in new customers and growing within our customers. We are firmly convinced we can reach €500 million revenues in 2027. That's the primary financial goal of five years business plan. We are preparing the organization in terms of human resources and Capex to accommodate this growth.

**What were your biggest technical advancements/key acquisitions for the last year?**

Our New Technologies Area is in full swing generating excellent value proposition to our customers, mainly driven from the head office in Spain and China. This is the result of so many years of investment, including in-house microencapsulation facilities for production scale (biodegradable), malodor technologies and sensorial analysis.

**What are the key factors/trends shaping innovation in F&F in 2023?**

Most of the 70% of our creations are into fine fragrances, leading market trends for most of the rest of categories. As a truly global company with manufacturing sites and teams all over the world, we can capture most of the current trends and anticipate the future ones working with high intimacy with our customers.



*José Balibrea, General Manager, Iberchem Group*

**Could you share your insights on the impacts of evolving regulatory updates?**

Without a doubt, there is an increasing regulatory framework everywhere we operate. Conscious about it, a long time ago we deployed more resources in both experts and technologies. Some good friends in this wonderful Industry seeing thunderstorms building all around us, referencing the European Green Deal and the threats that the possible forthcoming regulations will have on the F&F industry. I firmly believe we need to be diligent and mindful with the chemical-phobia or synthesis-phobia, particularly with all related to such old and beneficial industry of fragrances and perfumes.

## José Manuel Mateos

General Manager, Flavors, Scentium

**What was your company's biggest business accomplishment last year?**

1. The main accomplishment for Scentium was to successfully reach its very aggressive sales budget in a very difficult year due to the raw material price situation for flavorings, food inflation, and the decrease in consumption in many markets; we reached growth figures of 17%.
2. After two years as part of Croda, the integration process has allowed Scentium to continue to deliver the personalized customer service that runs through our DNA.
3. In terms of the business, the beverage sector is consolidating as a leading sector for Scentium, with the following highlights: Our growth in carbonated beverages continues unabated, with significant growth in colas, isotonic beverages with functional ingredients, and a sales growth of organic flavours in soya beverages.
4. In the Confectionery sector: A sales growth in confectionery with functional ingredients.

**What were your biggest technical advancements/key acquisitions for the last year?**

1. Achievements at Scentium, Alhama de Murcia (HQ) 2022:
   - A warehouse for raw materials, with a total area of 1,395 m2, 50% of which is for hazardous products (500 MT).
   - A photovoltaic installation of 109.02 kWp for self-consumption at Scentium Flavors, 20-25% of the total energy consumed.



*José Manuel Mateos, General Manager, Flavors, Scentium*

- The production capacity of the beverage emulsion line has been doubled to a theoretical capacity of more than 3000 MT per year.
- Investments made to improve safety conditions at work in different areas of the production process:
  - A new semi-automatic packaging line increasing packaging capacity by 20%.
  - A production system for the development of a new line of emulsions with natural dyes.
  - Loading manipulators on the emulsion lines.
  - The installation of evaporative coolers to improve temperature conditions in the production rooms.

2. Approval of the project to expand Scentium's production facilities and offices in Alhama de Murcia on adjoining plots of 3,000 m2, with an investment of €6 million, which will be completed throughout 2023, and which will allow us to double our production capacity and extend our production lines:
   - 900 m2 for the production of flavor powders. This will give us a production capacity of over 4000 MT.
   - Expansion of the liquid flavor production area by an additional 500 m2 and installation of new mixing tanks and a new packaging area, which will allow us to increase capacity by 40% and improve process efficiency.
   - New production area for atomized flavorings (200 m2) with new equipment with a capacity of 100 kg/hour, which will increase our production capacity tenfold compared to the current one.
   - Construction of a 100 m2 quality control laboratory within the production facility.
   - Module of new offices with a surface area of 550 m2.
3. Approval of the laboratory expansion project, including pilot plants for beverages and confectionery.
4. Installation of a new emulsion production line at the Tunisia facility.
5. Capacity expansion and warehouse refurbishment at the Mexico facility.
6. Approval of the construction of new laboratories in Dubai.

**What are the key factors / trends shaping innovation in F&F in 2023?**

A new age of well-being is significantly influencing Food and Beverage (F&B) trends. Brands are focusing on holistic well-being with moderation and avoidance claims as they maintain high nutritional benefits for a positive impact on health. Due to inflation, consumers are re-evaluating their expenses in search of affordable nutrition without compromising on taste, texture, and valuable attributes. Plant-alternative options, along with natural, better-for-you and sustainability demands are also shaping our sector.

At Scentium, we have developed natural vegan-friendly flavors in addition to our functional ingredients, sugar, and alcohol reduction solutions, all according to our customer specifications. Our tailor-made flavors and product formulations aligned with the growing trends has always promoted a very loyal client base. These are the basic key drivers in trends to focus on for a successful 2023.

**Could you share your insights on the impact of changing regulatory updates?**

Today, there is a strong trend towards natural, healthy, and sustainable products. In order to adapt to these trends, we are constantly looking for alternatives to 'traditional' sources. Our aim is to protect consumers and the environment by encouraging innovation in the development of safe and sustainable alternatives.

One such example is the use of biotechnologically produced Ambrettolide, which is made from 100% renewable carbon, making it suitable for vegan diets. The traditional source of this compound was not suitable for vegans, and so, with this alternative and sustainable source, we have made several of our flavors vegan-friendly.

Ten years ago, it would have been unthinkable to produce organic flavorings, but with the new organic regulations coming into force, and the current organic trends in society, there has been a positive incentive for companies in the industry to work on the development of organic flavorings. There is now a wide range of organic ingredients for flavorings. Thanks to the development of organic raw material manufacturers, here at Scentium Flavors, we have

been able to create organic alternatives for many of our flavorings.

## Manuel González

Global Finance Director, Iberchem Group

**What was your company's biggest business accomplishment in the last year?**

1. In 2022 we reached a new sales record of 250 million, a significant increase of 21%, bolstered by strong sales in Asia, the Middle East and Latin America. This year we have outperformed our competitors once again, with double-figure growth supported by:
   - Extraordinary growth, despite an adverse operating environment in some of the countries impacted by high inflation rates and significant disruptions on raw materials (prices and supply).
   - Our distinctive position in emerging markets, portfolio breadth, and agility.
   - Iberchem's unique business model proved its resilience and success once again, leading to long-term profitability and value creation for our stakeholders.
   - Our highly experienced teams are able to navigate the challenging economic environment.
2. French fragrance house Parfex's integration into the Iberchem family. The acquisition of Parfex has been key for us to diversify our portfolio.
3. The Iberchem group's integration into the Croda family. Synergy captures already registered in sales; several significant ongoing projects will accelerate the Iberchem model growth.
4. A new sustainability milestone at our headquarters. Iberchem was able to significantly reduce its scope 1 and 2 carbon emissions at the head office by 85.14% between 2018 and 2021.

**What were your biggest technical advancements/ key acquisitions for the last year?**

1. Significantly increasing investment in new technologies.
   - Continuing development of our biodegradable microencapsulation technology Vernovacaps and new biodegradable solutions for fragrance technologies.
   - Running our neuroscientific program building lab and developing a partnership with the research unit of the University of Lisbon to continue developing and demonstrating our fragrance technology benefits.
2. The deployment of our 2022-2027 capital expenditure plan. We have made significant investments in China (Pearl Project), France (acquisition of Parfex), Spain, Dubai, and Indonesia to upscale the group's capabilities.



*Manuel González, Global Finance Director, Iberchem Group*

**What are the key factors/trends shaping innovation in F&F in 2023?**

### Key Challenges 2023

- As the significant disruptions have started to ease in our industry, we aim to continue our focus on high-growth sectors and strengthen our sales network around the world together with Croda and Parfex.
- Building and delivering our capital and people investment program. Adding significant additional resources during 2023 and planning for the following years.
- Progressing our decarbonization plan across all our centers.

Aiming for double-figure growth in line with the recently unveiled 2023-2027 business plan and new milestones in our sustainability program, contributing to Croda's commitment to become Climate, Land and People Positive by 2030.

### Current Trading

We have just released our first quarterly results, which we are not disclosing, but we are confident in our ability to deliver growth in both Fragrances and Flavors, and to continue to create value for our shareholders by setting a new sales record in 2023.

p&f+

perfumer & flavorist®

The Resource for Sensory & Wellness Innovation

# Tune In!



*Perfumer & Flavorist+*

## Multimedia

www.perfumerflavorist.com/multimedia

# IFF

**New York, New York**
**2022 Sales: $12.44 billion[a]**

Over the last 12 months IFF has been making headlines for various investments and strategic moves to remain a key player in the F&F space. For instance in December 2022, IFF announced the sale its Savory Solutions Group to private equity firm PAI Partners.

Months later in April 2023, IFF debuted two state-of-the-art flavor labs at its facility in Brabrand, Denmark. The sweet and culinary flavor creation labs are the latest addition to the company's campus which has been in operation since 1964, boasting over 312,150 square feet offering resources including pilot plant manufacturing and evaluation studios.

Most recently,the company promoted its creative director of Fine Fragrance, Trudi Loren to vice president, Global Innovation, Creation and Design. In her new role, Loren has taken the helm of the creative and innovation teams of the Fine Fragrance business unit globally. More impressive investments are in the pages ahead.

For this year's Leaders & Newsmakers issue, IFF has tapped CEO Frank Clyburn as well as two segment leaders to discuss investments by the company as a whole as well as in their respective sectors.



*IFF is leveraging the company's comprehensive in-house biotech capabilities to accelerate sustainability-focused innovation.*

## Frank Clyburn

CEO, IFF

**What was your company's biggest business accomplishment in the last year?**

**Frank Clyburn [FC]:** IFF's transformation journey has entered its next chapter, with the 2022 launch of our Do What Matters Most strategy, to Be the Premier Partner, Build Our Future and Become One IFF, embedding ESG in all we do. Having completed several transformative milestones, we are acting with urgency to capitalize on strengths and address opportunities. Our refreshed strategic framework and new operating model will increase customer centricity and better align with end-market needs. This next phase is designed to ensure we are innovative, efficient and disciplined. To do so effectively, we are increasing productivity, reinvesting in our highest-value businesses, and enhancing our culture to maximize value creation for our customers, employees and shareholders.

To better serve customers and consumers, we are making significant investments in talent and infrastructure, expanding our presence in fast-growing markets. The company has bolstered our Africa-Middle East operations through the enhancement

[a]https://ir.iff.com/static-files/4e8da295-8692-406e-99c5-d4635bc35e6a



*Frank Clyburn CEO, IFF*

of its state-of-the-art creative center in Dubai. Additionally, IFF's footprint in Asia is undergoing substantial upgrades, including the opening of the Singapore Innovation Center—an expansive facility integrating the technologies, capabilities, and expertise of all business divisions. This center—with an investment of $30 million—represents IFF's largest in the region, spanning nearly 11,000 square meters.

With one of the industry's largest annual R&D investments in 2022, IFF is leveraging our comprehensive in-house biotech capabilities to accelerate sustainability-focused innovation. This commitment to sustainability was acknowledged when IFF received the prestigious Supplier Sustainability Award from P&G. In fact, we've enabled customers and consumers to save more $CO_2$ than what is generated at IFF's own manufacturing sites, by accelerating the wider adoption of sustainable solutions in the marketplace, as documented by life cycle assessments.

Additionally, we've been recognized externally for our ESG leadership, including being named to the Dow Jones Sustainability Indices for the third consecutive time, and maintaining the 2022 EcoVadis platinum sustainability rating, which places IFF among the top 1% of companies assessed. We've been named to the CDP Climate A list for the eighth consecutive year, and we completed our first virtual power purchase agreement, expected to cover approximately 30% of the total electricity needs of its European sites when it becomes operational at full capacity in 2024.

We also have been making progress in deepening our already strong commitment to diversity, equity and inclusion. We were recertified as EDGE Move level globally for our commitment to gender parity and included in the Bloomberg Gender-Equality Index for the second time. We also introduced a Global Parental Leave Policy that grants a minimum of 16 weeks of 100% paid leave for a new IFF parent, regardless of gender identity or expression.

By Doing What Matters Most, IFF is well-positioned to achieve its strategic objectives and deliver innovative solutions that meet the evolving needs of its customers and consumers.

## Nicolas Gebara

### Senior Vice President, Commercial and President, Flavors, IFF

**What were your biggest technical advancements/ key acquisitions for the last year?**

**Nicolas Gebara [NG]:** In a year of bold moves and ground-breaking innovation, we have reaffirmed our commitment to advancing scientific discovery and co-creation capabilities worldwide. With the opening of our Innovation Centers across the US, LATAM, Europe, and Asia, we've invested in supporting our customers as we develop new-to-world solutions that benefit people and our planet.

One of our most exciting partnerships is with Florida Polytechnic University, as we celebrated the construction of a Global Citrus Innovation Center.



*Nicolas Gebara, Senior Vice President, Commercial and President, Flavors, IFF*

This state-of-the-art facility will drive citrus research and development, helping to bring breakthrough solutions to the food, beverage, and fragrance industries.

We're also thrilled to have launched IFF Neo[b], the industry's first portfolio of natural flavors that delivers maximum citrus taste impact without using citrus oil, or any ingredient derived from the oil. This innovation provides exceptional taste while overcoming the challenges of working with citrus oils. We also announced an exciting initiative in Personalized Nutrition by launching our IFF Digital Health[c] platform.

Our impact in the plant-based protein space has been equally impressive. With Supro Tex[d], we've introduced a breakthrough technology for creating whole-muscle plant protein meat alternatives without requiring major capital investments or a refrigerated supply chain. We've launched Seaflour[e], a natural seaweed with clean label properties for plant-based beverages, providing stability, creaminess and a smooth mouthfeel.

## Christophe Fauchon de Villeplee

President, Scent, IFF

**Christophe Fauchon de Villeplee [CFV]:** Our robust innovation pipeline showcases leading solutions which cater to the evolving needs of consumers.

In 2022, we proudly launched AmberNat, our latest captive molecule for use in perfumery. AmberNat represents a significant achievement, as it is not only 100% renewable but also readily biodegradable. This launch marks a pivotal moment for IFF ambers, combining an intense dry amber note with an environmentally friendly profile. This innovation exemplifies our strong commitment to driving consumer delight and attaining our sustainability goals.

Through a partnership with SleepScore Labs, initiated in 2020 and supported by IFF's internal Science of Wellness program, we have introduced a revolutionary scent solution to improve sleep quality. Showcased at CES 2022 in Las Vegas, this scent has demonstrated objective sleep improvements in a SleepScore Labs study. The benefits observed include faster sleep onset, reduced nocturnal awakenings, extended sleep duration and enhanced sleep efficiency.

As mentioned above, we are making significant strides in our cross-divisional Citrus strategy. In 2022, we successfully launched the LMR Citrus Organic Collection. This collection is the result of sourcing from reputable producers renowned for their exceptional quality and harnessing leading capabilities of both LMR Naturals By IFF (Grasse, France) and CitraSource (Winterhaven, United Kingdom). The organic collection comprises seven citrus varieties carefully selected from our portfolio, ensuring the utmost integrity of the entire supply chain while promoting responsible agricultural practices among local farmers.



*Christophe Fauchon de Villeplee, President, Scent, IFF*

By leveraging cutting-edge technologies and strategic partnerships, IFF remains at the forefront of innovation, continuously introducing groundbreaking solutions that positively impact consumers' lives.

**What are the key factors/trends shaping innovation in F&F in 2023?**

**NG:** The food and beverage industry is undergoing a remarkable transformation driven by changing consumer demands and global trends. One major trend shaping innovation is sugar reduction. Consumers have become increasingly health-conscious, demanding healthier options with low or no added sugar. However, as consumers will not compromise on taste, there are innovative technologies that can give the next generation of better-for-you beverages the healthy, indulgent quality that consumers seek. One example is the trend of No/Low alcohol beverage consumption, which has been growing 6% globally since 2021 and is projected to continue at this pace.

Another factor driving innovation is the demand for personalized nutrition. Consumers who embrace healthier lifestyles seek personalized nutrition plans tailored to their needs and preferences. This trend is supported by digitalizing consumer health and

[b]IFF NEO is a trademark of IFF
[c]IFF Digital Health is a trademark of IFF
[d]SuproTex is a trademark of IFF
[e]Seaflour is a trademark of IFF

behaviors, enabling companies to analyze consumer preferences and behavior data and offer personalized recommendations for better health outcomes.

The demand for clean label products with simple, recognizable ingredients, remains strong among consumers. To meet this demand, the industry is developing natural flavor ingredients that meet clean label requirements. This includes the use of biotechnology, an area where IFF is very strong. We see biotechnology as a key enabler that will shape the industry in the future, particularly in sustainability. By leveraging bioscience, we aim to provide technologies that support our customers in meeting their ESG goals and consumer demands.

Sustainability has emerged as an overarching and powerful trend, with consumers increasingly conscious of the impact of their food choices, leading to significant shifts towards sustainable practices in the industry, such as championing circular design principles, again, an area where IFF leads.

**CFV:** Using IFF's proprietary Trend & Foresight capability—Panoptic—we've identified the following longer trends informing innovation priorities in the current year and beyond:

**Bio (R)Evolution:** With consumers and customers increasingly seeking products that benefit people, communities, and the planet, there is a growing demand for sustainable and environmentally-friendly offerings. As Nicolas mentioned, investments in biotechnology are on the rise as businesses recognize the potential for innovation and sustainable solutions in this field.

**Health & Well-being Amplified:** The importance of health and wellness has gained significant traction, with consumers seeking products that offer scientifically backed claims and tangible benefits for their well-being. Proactive healthcare and holistic therapies are experiencing a surge in popularity as individuals prioritize their overall health, recognizing that well-being is the true measure of wealth.

**Demographic Shifts:** Aging populations, urbanization, and evolving socio-economic values are influencing consumer demand and expenditure patterns, prompting companies to adapt their offerings to meet the changing needs and preferences of different demographic groups.

**Digital Acceleration:** The rapid acceleration of digitalization brings forth new possibilities and expectations in the fragrance industry, with a need to explore scent experiences in the "phygital" (physical-digital) world. Emerging commercial channels and personalized experiences enabled by digital technologies present exciting opportunities for businesses to connect with consumers in innovative ways and create tailored solutions.

**Could you share your insights on the impacts of evolving regulatory updates?**

**NG:** Regulatory updates have a significant impact on the food and beverage industry, particularly in areas related to health. For example, regulations around sugar and salt reduction have accelerated. In recent years, many countries have introduced sugar taxes to reduce sugar consumption, which has prompted companies to reduce the sugar content in their products or introduce low-sugar alternatives. The European Union has implemented stricter labelling requirements, including mandatory nutritional labelling on the front of packaging. In Brazil, new labelling legislation was implemented in 2022 to include a front of pack stamp to indicate sugar, fat and sodium content.

Regulatory updates can create initial challenges, but they also present opportunities for innovation: to develop new products that meet regulatory requirements while still meeting consumer demands for taste, affordability, convenience and health benefits.

**CFV:** The most significant development of the past year is the EU Chemicals Strategy for Sustainability. This initiative aims to comprehensively revamp major regulations that govern the use of fragrance ingredients, such as REACH, hazard classification (CLP), and cosmetic product regulation. The proposed changes encompass several key aspects, including the introduction of new hazard classes, the utilization of grouping for expedited assessments, increased authority for the Chemicals Agency, heightened testing requirements for low volume substances, and the incorporation of additional safety factors to address mixture effects.

We consider this initiative of paramount importance and are actively engaging in advocating for the industry's specificities, notably very low use levels of ingredients and complexities associated with naturals.

In addition to the EU Chemicals Strategy, there are other noteworthy developments. Firstly, after a process spanning over a decade, the allergen labeling in Europe is poised for extension. Secondly, the publication of the Modernization of Cosmetics Regulation (MOCRA) in the United States seeks to overhaul federal regulations pertaining to cosmetics. Lastly, the forthcoming release of the 51st amendment of the IFRA Standards, expected in the middle of the year, holds significance for the industry.

All these changes will subject ingredient-palettes used in fragrance creation to increased examination. It is vital for our industry to maintain constant, constructive dialogue with regulators to ensure that resulting regulations remain proportionate and conducive to the continued enjoyment of fragrances by consumers while ensuring safety.

# Kerry Group

**Kerry, Ireland**
**2022 Sales: €8.8 billion**




*With more than 1,100 researchers and application experts, Kerry is very excited about the innovation opportunities that the 2023 trends are encouraging.*

Last year marked Kerry Group's 50th anniversary and a year for record sales growth. The company boasted a remarkable four acquisitions throughout 2022 in Germany, Malaysia, the United States and India. In early 2023, the company also announced the sale of its Sweet Ingredients portfolio to IRCA.

CEOs Edmond Scanlon and John Savage join us to discuss the company's key strides and acquisitions that led Kerry to such success and plans to continue its trajectory to being a key player in flavor.

## Edmond Scanlon

CEO, Kerry Group

**What was your company's biggest business accomplishment in the last year?**

Kerry's 50th anniversary in 2022 was marked by significant growth, strategic development and a strong focus on sustainability. The company's organic growth of 18% and record revenue levels of €8.8 billion were particularly noteworthy, given the challenging operating environment. This success was driven by Kerry's continued strategic evolution and close customer partnering.

In terms of strategic development, we made significant progress in the development of our innovation platforms, footprint expansion and continued portfolio development. The company expanded its capabilities in key regions, including the United States and Saudi Arabia and we also opened the largest taste producing facility of its kind on the African continent in Durban, South Africa. In addition to this, we made good progress in the continued development of a new taste facility in Karawang, Indonesia, which will open this year. These efforts will enable Kerry to better support

our customers' growth and value creation in important territories and market segments.

Kerry's acquisitions in 2022 were also notable, with the company completing four deals in Germany, Malaysia, the United States and India. These acquisitions brought new product offerings and technological capabilities to Kerry's science base and helped us further align our portfolio with sustainable taste and nutrition. Additionally, Kerry's divestment of its Sweet Ingredients business was an important step in this portfolio alignment.

Sustainability is at the center of Kerry's vision and I am proud to say that we made good progress towards our sustainability objectives in 2022. Kerry achieved a 48% reduction in absolute carbon emissions and sourced 100% of purchased electricity from renewable sources. These efforts reflect Kerry's commitment to creating a world of sustainable nutrition and our belief that, by working with our network of customers, suppliers, and partners, we can make this vision a reality.

Looking ahead, Kerry is well-positioned to continue building on its successes in 2022. The company's continued focus on strategic development, acquisitions, and sustainability will be key drivers of future growth and value creation.



*Edmond Scanlon, CEO, Kerry Group*



*John Savage, CEO, Taste, Kerry Group*

## John Savage

CEO, Taste, Kerry Group

**What was your company's biggest business accomplishment in the last year?**

We achieved a number of advancements during the year. The overall theme is that we continue to advance the quality of taste in many different product areas; we know from continuing surveys that taste is critical to consumers. For example, in plant-based meat development we recently released Succulence PB, an ingredient that helps build and maintain the juiciness of plant-based meats while also enabling a reduction in caloric content. Sugar reduction is a key global health trend but one that brings significant challenges in terms of the taste experience. Our Tastesense Sweet range of natural taste modulating ingredients supports taste by delivering the mouthfeel, texture and sweetness that suffer when sugar content is dropped.

In extract technologies, we have developed and expanded innovations in sustainably extracting natural flavors from many different botanicals for use in beverage product development. Key tonalities in this area include citrus, coffee, cocoa and many flavors for low- or no-alcohol beverages—but also any beverage. Our naturally produced stocks and broths from meat, bones and vegetables make natural flavors available for product and meal developers.

We continue to expand our offerings in authentic savory taste, based around natural flavors and developments in umami and kokumi, and in advancing reaction flavor chemistry for chicken and beef. We are also global leaders in environmentally friendly smoke technology that helps to create and deliver many outstanding natural smoke flavors. Our technology keeps smoke and ash within a contained

smoke machine, preventing smoke from polluting the air around the facility.

**What are the key factors/trends shaping innovation in F&F in 2023?**

There are five key factors which are shaping innovation in the food industry today. One we are encountering, with increasing frequency, is the request for more sustainable ingredients. This request stems from the fact that companies are looking to reduce their GHG emissions and provide greater transparency on the sourcing information of the ingredients included in their products. This increased popularity of sustainably sourced ingredients has allowed for sustainably themed front of pack labels.

Secondly, the low and no alcohol category has recently seen very exciting developments and innovations. As consumers are becoming more concerned about their alcohol intake, their taste expectations in this category are increasing. This is forcing the industry to innovate and develop ingredients which can deliver on these growing consumer expectations. A fantastic example of innovation in this space has been our Botanicals Collection Zero 2.0 which allows us to deliver great tasting flavors while walking away from traditional solvents. This innovation was specifically designed for the global rapid growth of the low and no alcohol markets as it permits drink manufacturers to have a "0.0%" claim.

Other key categories which are experiencing high levels of innovation are the meat and dairy alternatives industries. This is because, for both categories, there is an increased expectation on the taste and nutritional benefits that consumers believe can now be delivered. Kerry is working on continuing to develop taste and formulation innovations that will further the plant-based revolution in the marketplace and the environment. The previously mentioned SucculencePB is a good example of Kerry's innovative work in this area.

Keeping on the theme of nutritional optimization of products, this is something that is being driven by a rise in consumers concerns around health and nutrition. As more consumers expect solutions which are lower in sugar, salt and fat, a key factor that must be kept in consideration when innovating in this space, is that consumers still want the "original" taste of products that they are accustomed to. This presents a major challenge in the industry and innovations in this space are sure to keep evolving for years to come.

Finally, in addition to all the other key factors, we must not forget that the cost-of-living crisis has resulted in many consumers looking for relative value options to meet their purchase preferences.

> "As leaders in R&D globally, [..] Kerry is very excited about the innovation opportunities that the 2023 trends are encouraging."

Affordability is a top concern for consumers and is greatly affected by inflation and the steady rise in ingredient and input prices. This then squeezes margins and forces producers to seek alternate sources and lower-priced ingredients. It's vital in this environment to make certain that the new lower priced alternate ingredients being offered are authentic.

As leaders in R&D globally, with more than 1,100 researchers and application experts, Kerry is very excited about the innovation opportunities that the 2023 trends are encouraging. Our continued research into new taste experiences, sustainable ingredients, cleaner labels, health support and added functional benefits means we are perfectly positioned to capture the trends above.

**Could you share your insights on the impacts of evolving regulatory updates?**

Regulatory actions are evolving rapidly in three key areas: sustainability and climate change; sustainable healthy nutrition for people; and pre-market approval of new ingredients. Kerry is actively involved and supportive in efforts to help its customers in each of these areas. What's critical is that the regulatory agencies and governments signal upcoming changes well in advance so that the industry can make the required adjustments.

With regards to sustainability and climate change adaptations in the food industry, Kerry is pleased to see the increased number of government initiatives on sustainability in the food industry

across the globe. These are urgently needed and Kerry is leading in many areas to help drive sustainability in the food sector and reduce food loss and food waste. Kerry has initiatives in all its product categories to develop new ways to combat climate change by being more efficient and environmentally responsible.

There is an increasing focus by governments on promoting sustainable healthy nutrition. Authorities are implementing strategies to ensure that consumers are making informed and healthy food choices with regard to sugar, salt, fat and caloric content in many different products, such as foodservice and restaurant meals in addition to food and beverage product manufacturing. Some of the initiatives to promote healthy diet include mandatory/voluntary front of pack (FOP) labelling rules, menu calorie and nutrition listings, and taxes on nutrient content such as sugar. Kerry's flavor modulation solutions help food manufacturers create nutritionally optimized products with great taste.

The regulatory and government requirements to put a new ingredient on the market vary immensely among the regions/countries and it is vital that ingredient suppliers know these rules and ensure their products are safe. There is no doubt that risk assessments have to be conducted in a thorough and responsible manner to ensure food safety. Companies that develop new ingredients need to provide all scientific data to demonstrate that their products are safe. What we see from the evolving regulatory updates is some authorities are following a very conservative approach for the risk assessment which requires several years of data collection.

When the time to do the risk assessment is added on top of everything the process becomes quite lengthy which can act as a disincentive for companies to innovate. One concern from an industry point of view is to make these regulatory processes as timely and transparent as possible so as to encourage additional food industry innovation. Encouraging and supporting innovation is a key way for governments and regulatory bodies to support the overall societal goals of addressing climate change, improving health and meeting nutrition targets, enhancing food safety and reducing food waste.

p&f+




Hosted by perfumer & flavorist

WPC

2024 WORLD PERFUMERY CONGRESS

The Sensory Event for Fragrance Leaders

*World Perfumery Congress*

June 25-27, 2024

Palexpo | Geneva, Switzerland

# Save the Date!

*Resign and Receive This Year's Rates*



# Mane

**Le Bar-sur-Loup, France**
**2022 Sales: €1,699 million**







*According to Jean Mane, the company's investments in new plants, creative centers and corporate offices demonstrate their commitment to innovation to cater to customer needs.*

A frequent flier in the F&F headlines, Mane returns to this year's Leaders & Newsmakers issue with insights in the company's wins across the world CEO Jean Mane has been traveling to facility debuts near and far for ribbon cutting ceremonies, with the most recent being the Byadgi site in Karnataka, India. The Byadgi facility is the main growing belt for high-color varieties of chili and is part of the Make-In-India program of the government of India. The facility contains a super-critical fluid extraction plant that uses carbon dioxide as an extraction medium. The site also has a deep connection to sustainability. In this interview, Jean Mane will be discussing the growth and expansion of the company as well as the focus on sustainability in production efforts.

## Jean M. Mane

CEO, Mane

**What was your company's biggest business accomplishment in the last year?**

As the president and CEO of Mane, I am proud to say that 2022 was a successful year for our company. The group continues to post solid results with consolidated 2022 sales of €1,699 million, up 12.8% from 2021, with significant growth in various regions, strong investments, new plant openings, and the establishment of new creative centers. The company has made significant strides in its business operations, achieving outstanding results across its various business units.

In the Fragrance division, we achieved significant growth in key areas such as the Middle East and Brazil, as well as expanding our global accounts and gaining access to Fine Fragrance new clients across all regions. We also opened a new fragrance compounding plant in the United States, effectively quadrupling our capacity and implementing advanced automation to support customization and new business development in a more agile way. Additionally, we inaugurated new creative centers in New York City, United States and Barcelona, Spain, with a focus on the fine fragrance markets. Our improved work spaces are intended to drive collaboration and innovation within our creative centers.

Looking forward to 2023, we plan to continue investing in fine fragrance worldwide with the opening of our Shanghai Studio in China and a new Paris Creative Center in 2024, as the headquarters of our Global Fine Fragrance division.

Flavors achieved a remarkable growth rate, bringing consumer-preferred taste solutions to the market, especially in the fast-growing beverage and snack categories. The team also prioritized stability in servicing their customers throughout supply chain disruptions. They continued to adjust our post-COVID working ways allowing us to increase face-to-face visits, along with customer visits to our development centers.

The company's investments in new plants, creative centers and corporate offices demonstrate our commitment to innovation to cater to our customers' needs. Our 2022 investments extended well beyond France. In the United States, the new Warehouse and Distribution Center of Parsippany, New Jersey, is in operation. In Japan, we inaugurated new offices in Tokyo. The opening of our third manufacturing unit in Cikampek marks a significant milestone in Indonesia—the plant which will focus on producing infant and pharmaceutical grade (IPG) flavors under the highest standards of hygiene, was awarded the Leadership in Energy & Environmental Design (LEED) certification Gold status by the U.S. Green Building Council (USGBC), showcasing our commitment to sustainability. In India, we have also made several investments. In Dahej (Gujarat), the new 20,500-square-meter facility will be Mane's largest manufacturing plant in India, equipped with advanced technologies and machinery, with an annual production capacity of 2,000 tons of flavor products and 3,000 tons of fragrance products. Also in India, and in line with our regional strategy to promote development and meet rising demand worldwide, Mane Kancor has increased capacity for the production of natural colors and antioxidant solutions in both the Angamaly (Kerala) and Byadgi plants. The largest new investment is officially inaugurated in Byadgi, Karnataka, and hosts a newly commissioned supercritical fluid extraction plant and a 25,000 tons yearly capacity continuous extraction plant for spice oleoresins. Those latest investments provide the group with the logistical and operational resources it needs to ensure market growth and continued development in South-East Asia. We also extended or revamped various new offices in Dubai, Amman in Jordan, and São Paulo.



*Jean M. Mane CEO, Mane*

Overall, Mane's 2022 accomplishments, with investments reaching 8% of our revenues, demonstrate our commitment to innovation, collaboration, and growth in the fragrance and flavors industry. With its plans for continued investment and expansion in 2023, the company is poised for even greater success in the years to come.

**What were your biggest technical advancements/ key acquisitions for the last year?**

In the Fragrance division, we have made significant strides towards sustainability. We are proud to announce that we have finalized the development of an ECHA compliant biodegradable microencapsulation technology for all markets. In addition, we have launched our innovative WellMotion[a] tool, which encompasses mood-enhancing fragrances and our Hyscent program, which assesses the bacteriostatic properties of targeted Mane in-house or captive raw materials and ultimately fragrance compounds. Furthermore, we have developed the next generation of our highly concentrated water-based

[a]WellMotion is a trademark of Mane

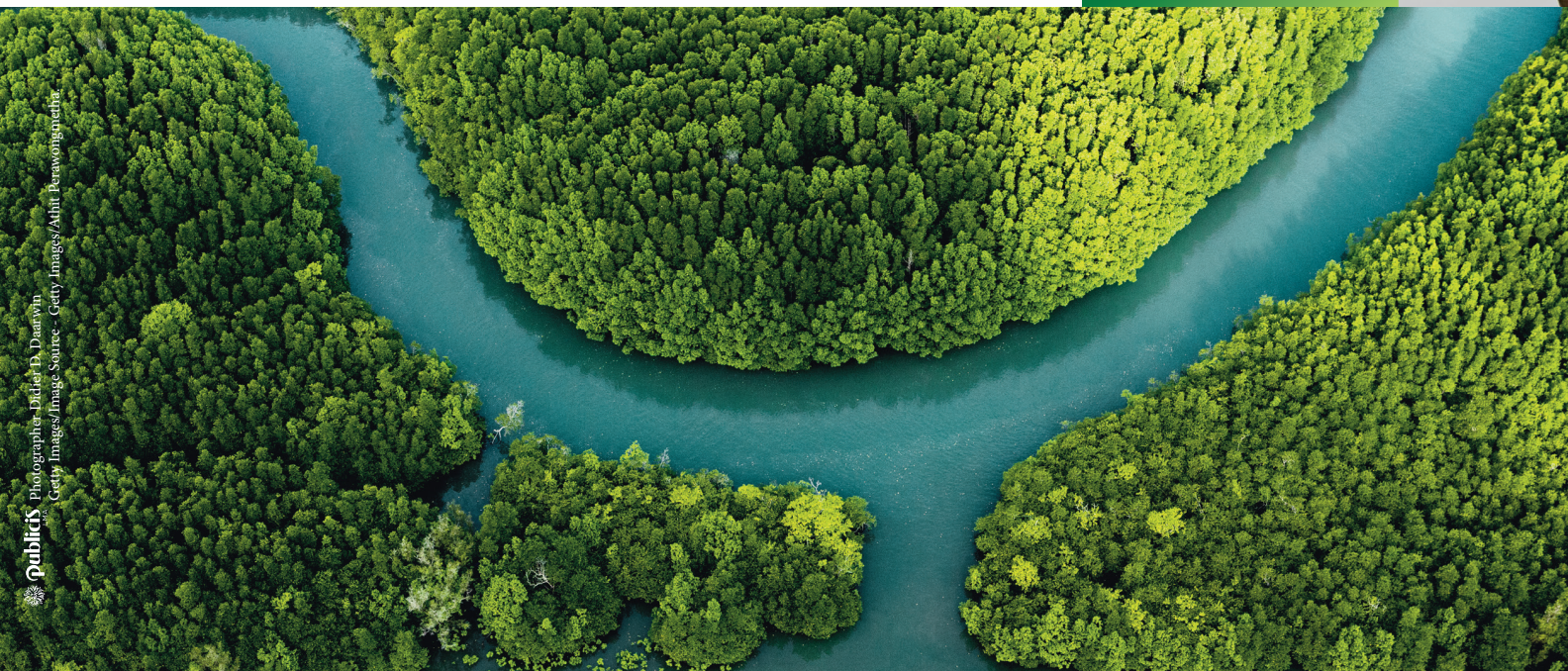


EXTRACTING
THE ESSENCE
OF NATURE'S MAGIC



WE
CAPTURE
WHAT
MOVES

MANE



Publicis Photographer - Didier D. Daarwin
Getty Images/Image Source - Getty Images/Athit Perawongmetha

microemulsion, Aquafine[b], which offers biodegradable properties.

In the Flavor division, we continue to innovate and develop new technologies to meet the demands of the market. Our Sweet and Confections team has promoted our differentiated delivery systems technology to the market, allowing flavor change and morphing benefits across a range of applications. Our Savory and Snack business team has launched delivery systems that maximize shelf life for low micro spice and herb oils, while our Taste Modulation team has promoted tailored solutions to deliver optimized taste in a range of customer products supporting health and wellness customer needs. Finally, our Dairy and Bakery team continues to lead with our vanilla solutions.

In the Ingredients division, with a focus to strengthen the farm to fork service offered by our company, we have joined hands with Natures Spices to launch a new venture called Mane Kancor Spices Pvt Ltd. This enabled us to reach out to customers with a wide array of spices portfolios. Furthermore, Mane Kancor's R&D team successfully formulated a clean label and stable red color from plant origin to replace Carmine, which they plan to launch in various regions in 2023.

As part of Sustainable Agriculture Initiatives by Mane Kancor, we trained mint farmers on sustainable agricultural practices and prepared them to get their farming practices audited and certified under Farm Sustainable Assessment Certification Program (FSA) initiated by Sustainable Agriculture Initiative (SAI) platform. With this initiative the farmers get collective access to the global market through us and will benefit with fair prices. Currently, more than 7,000 mint farmers are certified under FSA by the Mane Kancor initiative. Mane Kancor is the first commercial manufacturer with the highest number of FSA certified farmers associated with the company for mint oils and menthol production.

The group also continued its strong commitment to reduce its environmental impact throughout the value chain. In connection with our compounding activities, our commitments to environmental preservation and regeneration focus as much on reducing the impact of our operations as on the eco-design of our products. We are now looking towards 2030, with our new CSR roadmap in hand.

We are determined to go further, notably in the pursuit of the reduction of $CO_2$ emissions across our entire value chain, in accordance with our science-based targets and a trajectory compatible with a global warming limit of 1.5 °C. In 2022, we have joined the initiative launched by the IOFI aiming at developing greenhouse gas (GHG) emission factors for a selection of non-proprietary ingredients commonly used in the flavor industry and made available to all IOFI members. This sector-wide collaboration and the great work of our procurement teams in engaging suppliers into climate-related issues will be key to address this challenge at the industry-level.

We are also investing heavily in artificial intelligence and digital solutions. Our artificial intelligence-based (AI) expertise has been amplified

[b]Aquafineis a trademark of Mane

CALL FOR SAMPLES AND TECHNICAL INFORMATION

Now manufactured in Middletown, NY

NATURAL ACETOIN
(DON'T GET CAUGHT SHORT AGAIN)
NATURAL IONONES
NATURAL LACTONES

Fleurchem, Inc.
www.Fleurchem.com
33 Sprague Ave • Middletown, NY 10940 USA • Phone: 845-341-2100 • Fax: 845-341-2121

# *Naturally Creative*






www.robertet.com



*The largest new investment is officially inaugurated in Byadgi, Karnataka, and hosts a newly commissioned supercritical fluid extraction plant and a 25,000 tons yearly capacity continuous extraction plant for spice oleoresins.*

by new technical possibilities, enabling us to provide new digital solutions and bring unique services to all our communities within the group. We are increasing their contribution to everyday processes—past efforts, current projects, and future digital innovations are centered around one unique proposal—transform ways we experience data to get even closer to our customers. The recent launch of the Mane Digital Factory finds its roots in this objective.

Overall, we are proud of our achievements in the past year, and we are excited to continue pushing the boundaries of technological innovation to meet the needs of our customers.

**What are the key factors/trends shaping innovation in F&F in 2023?**

Innovation is at the heart of Mane, and as we move forward in 2023, we are determined to continue our ongoing commitment to innovation, and customer satisfaction. Sustainability is a core value that shapes innovation, and we continue to innovate by highlighting our core values of sustainability in protecting our planet, employees, and communities.

For Fragrances, consumers are more educated and fluid than ever before, and they are looking for carbon renewable and biodegradable fragrances with reduced environmental impact. We are also seeing innovation in water-based delivery system solutions. At Mane, our Green Motion[c] tool, introduced 10 years ago and perfected since, allows our perfumers to build transparency around our clients' sustainability goals within the fragrance design process. Additionally, cross-category research allows us to understand consumer unmet needs holistically throughout all categories of consumer products and fine fragrances, creating an opportunity for consumer-led innovations. Lastly, the speed of digital innovation of retail channels, creating space for digital fragrance solutions and innovation beyond product: business and marketing innovation.

For Flavors, health and wellness continue to drive flavor innovation. Consumers are looking for functionality in their food, pushing the industry to identify taste solutions for masking, modifying, and providing an overall ability to cover off-notes. We are also seeing innovation around taste solutions that provide a cooling, warming, mouth-watering or tingling sensation. Consumers are drawn to products that deliver a differentiated mainly trigeminal sensorial experience. In addition, consumers' desire to reduce sugar consumption is driving innovation around sweetness enhancement and improvement. Our consumer insights team is studying Gen-Z consumers to

[c]Green Motion is a trademark of Mane

identify shifts in flavor preferences that will drive the flavor creation of tomorrow.

Sustainability remains a great concern for consumers in 2023 and, at Mane, we are committed to developing natural ingredients and technologies mindful of the environment. Our developments embed our expertise in green chemistry, upcycling of by-products, carbon renewability, and biodegradability improvement. A good example is the launch of our first generation of biodegradable capsules Manencaps[d] FC Cleen for softeners. As we accelerate our actions' pace against climate change by having set ambitious emission reduction targets aligned with a 1.5°C global warming scenario, our teams are working hard to implement actions aiming at reducing our direct and indirect carbon emissions. We are advancing toward carbon footprint measurement at ingredient and formula level, for both flavors and fragrances, and our Green Motion pioneering tool is undoubtedly a solid foundation on which we can build on.

Lastly, digital innovation remains a key area of interest. We have invested in digital innovation by developing tools to support the digital transformation of our internal processes and to offer more relevant services to accompany our customer's needs. The flavor and fragrance industries are continuously evolving to meet the changing demands of consumers. The focus on sustainability, innovation, and digitalization will continue to shape the future of our company, leading to new and exciting products and experiences for consumers.

**Could you share your insights on the impacts of evolving regulatory updates?**

As a leading company in the flavor and fragrance industry, we are well aware of the impact that evolving regulatory updates can have on our business.

In the fragrance industry, our clients are increasingly pushing for global inventory compliance, which presents a challenge for international players. The evolution of labeling requirements and the increased number of allergens that must be labeled in the EU create additional complexity and cost in formulation and service. However, we view the trend toward more complex regulations as an opportunity to drive scientific research and continuously evolve our palette of fragrance ingredients.

In the flavor industry, regulatory needs continue to evolve as consumer demand for transparency and knowledge about the food and beverage they consume remains strong. There is an increasing desire for natural, clean ingredients. Taste solutions for plant-based and organic consumer goods are continuing to grow. Additionally, functional nutrition is a prevalent market trend overall. As an active member of the IOFI, Mane supports the global initiative to promote the use of the IOFI Global Reference List of flavoring ingredients in countries in which authorities are elaborating a national flavor regulation, such as Thailand, Vietnam and India.

At Mane, we are committed to responsible and sustainable business practices. As we move from soft law to hard law regarding sustainability management in value chains and ESG reporting, we see the current and upcoming regulations linked to the EU Green Deal as an opportunity to strengthen policies and processes already in place. Our responsible purchasing policy, which was defined in 2009, and our due diligence process are being extended to all our subsidiaries, thereby strengthening our commitment to responsibly manage supply chains and prevent human rights, environmental or ESG-related risks. We are also preparing for the Corporate Sustainability Reporting Directive and Green Taxonomy reporting obligations.

Overall, regulatory updates and sustainability management are becoming increasingly relevant across the industry, and Mane is taking innovative steps to remain at the forefront of their field.

[d]Manencaps FC Cleen is a trademark of Mane



# Robertet

**Grasse, France**
**2022 Sales: €703 million**




*Today, the Robertet Group is represented in more than 50 countries, has more than 2,200 employees worldwide.*

Robertet S.A. was founded in Grasse in 1850 and is the world leader in natural products. Based in France and majority family-owned since its creation, the Robertet Group is still controlled by the Maubert family and is the only fragrance, flavor and ingredient company that is fully integrated throughout the entire creative process, from source to final fragrance or flavor.

Today, the Robertet Group is represented in more than 50 countries, has more than 2,200 employees worldwide and offers its customers a range of more than 1,350 natural materials and products created in one of its 14 global creation centers. In 2022, the Robertet Group has achieved a global net turnover in excess of €700 million.

In 2022, Robertet underwent a change of governance with the arrival of a new managing director, Jérôme Bruhat, who took up his post on July 1, 2022. This is the first time that a non-family member has taken on this responsibility. With a "fresh" perspective, he gives us his impressions of this past year.

## Jérôme Bruhat

Managing Director, Robertet

**What was your company's biggest business accomplishment in the last year?**

Despite a difficult economic situation, with inflation, the gradual emergence from the COVID-19 crisis and the war in Ukraine, the Robertet Group has been able to set new records by exceeding the symbolic €700 million mark in turnover for the first time. This represents an increase of +16% in relation to 2021, almost perfectly distributed across all our divisions and regions of the world, between organic growth, the effects of acquisitions and the favorable effect of exchange rates. In addition, the company's extra-financial performance is on track, with progress made on almost all of the 17 United Nations Sustainable Development Goals (SDG), demonstrating Robertet's historic commitment to sustainable development.

Robertet's main success is first and foremost its unique model, which integrates the product

from the field, in partnership with suppliers, right through to the product that we deliver to our customers with excellent traceability. This model has enabled us to deliver to all our customers in 2022, despite the many challenges, while maintaining our high level of quality. The second success is being able to engage customers from all walks of life and from all countries, who come to us for our agility and strong expertise in the field of naturalness and original creations. We offer them personalized solutions through exchanges based on respect and trust.

The number of our certified sustainable supply chains increased steadily in 2022, demonstrating our commitment to eventually certify all our strategic supply chains. Corporate Social Responsibility (CSR) is a strategic axis of our development and our ambition is to become the leader in certified sustainable supply chains.

**What were your biggest technical advancements/ key acquisitions for the last year?**

As the world leader in natural raw materials, Robertet aims to contribute to the development of a more natural and sustainable world. Environmental awareness is growing in light of the climate, societal and geopolitical challenges we face. Our unique positioning and business model give us a considerable advantage. The traceability of the entire development process that we guarantee to our customers is the result of decades of practice. It allows us to optimize, step by step, the entire value chain and to ensure its sustainability. The creation of Robertet Bio for our organic products and of a sourcing center for the sustainability and optimization of our supply chains are further milestones.

With our ancestral know-how regarding the transformation of living plant matter, which has been passed down from generation to generation, we anticipate developments in the technological and environmental fields with passion, creativity and a spirit of conquest. Robertet has a circular vision of nature and develops innovation programs at the cutting edge of technology. We have developed upcycling ranges of products derived from the waste or co-products of our extractions, such as cocoa, whose cycle is explored in its entirety for applications in perfumery, flavors or as an active ingredient for the nutraceutical, beverage and functional food markets. Our experts are exploring original extraction technologies such as $CO_2$, microwaves or solutions to replace hexane: one of our patents has allowed us to create a range of natural products extracted from a 100% biodegradable and non-CMR “green” solvent.



*Jérôme Bruhat, managing director, Robertet*

Through Astier Demarest in 2021, which specializes in the sourcing and distribution of raw materials, we have strengthened our competitive advantage in the sustainable sourcing of natural products, by increasing our presence at the source in strategic sectors. In 2022, the acquisition of Omega Ingredients in the UK created unique synergies with our creative teams in imagining natural flavor solutions and strengthened our positions in the UK market. New opportunities are being explored and new alliances will emerge in the years to come.

**What are the key factors/trends shaping innovation in F&F in 2023 ?**

The market is driven by growing expectations for naturalness. In all markets, consumers are looking for more transparency, sustainability and true stories about the ingredients they consume. Robertet, with its unique Seed to Scent[a] program, has risen to 7th place worldwide among fragrance and flavor companies, and is recognized as the uncontested leader in natural raw materials. Our development priorities are innovation, sustainability and globalization. Innovation is at the heart of Robertet, and the growing enthusiasm for natural ingredients is opening up new avenues of scientific innovation, new palettes of ingredients for our creators and new services for our customers. Robertet is going to become the world's innovation hub for natural products, both through our investments in R&D and with our first startup accelerator, Villa Blu by Robertet, the new center entirely dedicated to visionary projects in the natural products

[a]Seed to Scent is a trademark of Robertet

ecosystem, which will open in 2023 in Grasse. The aim of this project is to strengthen Robertet's leadership in natural products by attracting the most innovative young companies. Villa Blu will host up to 20 start-ups from around the world and help entrepreneurs create the most revolutionary innovations in natural products, flavors, fragrances and ingredients for a more natural and sustainable future.

Sustainable development is also part of our DNA, and we need to speed up, given the urgent need to address climate change, with sustainable supply chains and solid extra-financial performance. Lastly, the globalization of some of our customers and the potential countries where Robertet has little or no presence are all potential sources of growth. All of this is only possible with the support of Robertet's loyal, committed and passionate teams, whose skills we support in their development, with reliable suppliers at our side, and with historical and new customers who trust us with our unique products.

**Could you share your insights on the impacts of evolving regulatory updates ?**

Regulatory changes can be seen either as an opportunity for improvement and innovation or as a limitation to creativity. We have many examples of innovations in response to regulatory challenges, such as the development of a method for analyzing traces of allergens present in natural extracts, which was a real analytical feat for our researchers. Or the development of qualities of plant extracts without some of their constituents deemed undesirable, which is a real technological challenge for our company and for the survival of these products.

Of course, this subtle work of reducing constituents that have become undesirable from a regulatory point of view in natural extracts, is not without consequences on taste and odor. This is where the prowess of our expert creators in natural products lies, in knowing how to compensate for the missing roundness in the aromatic compositions, as one would do for a musical score amputated of certain notes, while preserving the spirit of the original work. Nevertheless, the most nostalgic might say that it was better before.

Our inclination for natural products inevitably placed us at the forefront of the organic flavor industry when the European regulations came into force in January 2022. Robertet was able to seize this opportunity to enhance the value of its range of organic flavors, which had already been developed for several years. Faced with these regulatory challenges requiring flexibility and agility, our human dimension is undoubtedly a major asset in the emergence of innovative solutions for the market.

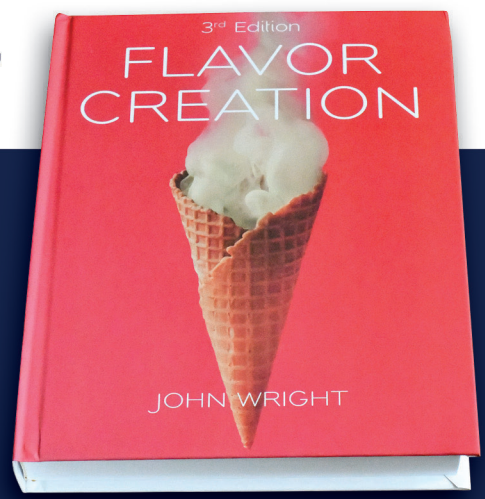
However, it is essential that regulatory changes remain proportionate, to allow for their progressive integration. Working with natural products with a fragile organoleptic balance, the development of new qualities may require some adaptation. Today, we are faced with an acceleration of regulatory changes, which may compromise the resilience necessary for the survival of certain natural extracts. This could have important societal consequences. We are therefore strongly mobilized, within our professional associations, to protect this cultural heritage as best as possible.

p&f+

JOHN WRIGHT'S FLAVOR CREATION,
Third Edition is now available!

Order the Third Edition now through Blurb
visit www.johnrwright.com for details

This must-have guide covers everything from flavor creation techniques and raw materials to end products and sensory science. Get your copy today!



# Let's Partner For Great Taste



## Discover our unique blend of art, science & innovation.

At Sensient, we take a collaborative approach—bringing together expertise, insight and technologies to creatively solve your toughest taste challenges and get you to market faster.

***Let's be taste buds!***







**Get in touch with us today and let's start the conversation.**
**1.888.200.9211 | flavors.info@sensient.com**
**www.sensientflavorsandextracts.com/partnerships**

SENSIENT®

# Sensient Technologies[a]

**2022 Sales: Approximately $1.44 billion**




*Sensient CEO Paul Manning checks in to discuss the company's strides over the last 12 months.*

Sensient Technologies comes to the 2023 Leaders & Newsmakers issue with another year of strong growth driven by the continued success of both current and new product lines.

This year's strides include a new customer and innovation lab that will fuel collaborative research and development; and, notably, the surpassing of its 2025 sustainability goals—and its immediate pivot to setting bold new benchmarks to reach by 2030, if not before.

All this is possible due to Sensient's long-standing commitment to operating in a legal, ethical and responsible manner, with a strong emphasis on corporate responsibility and fostering sustainable business practices. Sensient views sustainable business practices as an essential aspect of long-term economic health and core values, and it expects each employee to actively contribute to the company's efforts.

Company leadership remains dedicated to considering the effects of its actions on shareholders, as well as its employees, suppliers, customers and the communities in which it operates. While nothing is possible without solid financial performance, consideration for all Sensient's stakeholders remains essential to business practices.

Sensient CEO Paul Manning speaks to Sensient's remarkably successful 2022 in the face of supply chain and other challenges and how Sensient integrates its diverse global operations to meet client needs in any market.

## Paul Manning

Chairman of the Board, President and Chief Executive Officer, Sensient Technologies

Sensient performed well in 2022, growing sales by 4% versus 2021 and posting a 34% gross margin. We will continue that momentum while honoring our

[a]Sales report confirmed by Sensient Technologies

commitment to transparency in business operations and the products we produce with our employees and customers alike.

Challenges remain. Supply-chain issues, while lessened, still exist on the global stage. Sensient's decades of working in local communities position the company well regarding access and delivery of raw materials. We will continue to expand and evolve our U.S. and global presence to obtain the highest-quality materials for flavors, extracts and other product lines. Let's take a look at some of our major milestones and accomplishments in 2022:

## Sustainability

### Soaring Past 2025 Sustainability Goals

Sensient is a longtime global leader in ecologically aware, sustainable sourcing, processing and distribution. We set ambitious goals and achieve them—in fact, we've moved past our 2025 goals two years ahead of schedule.

Sensient's commitment to sustainability is outlined by our five pillars: Decarbonization, Water Stewardship, Waste Reduction, Sustainable Supply Chain and, new this year, Sustainable Product Design. Significant work still needs to be done in each area, which means more goals, and our updated targets are very ambitious. Our 2030 targets include:

- Reduce carbon intensity of Scope 1 and Scope 2 greenhouse gas emissions by 30%
- Reduce overall water withdrawal by 30%
- Reduce water withdrawal intensity by 30% in areas categorized as having high or extremely high-water stress levels
- Increase average landfill diversion to 75%

Sensient faces unique challenges in our efforts to reduce our greenhouse gas emissions over the long term. Our success depends upon our efforts



*Paul Manning, Chairman of the Board, President and Chief Executive Officer, Sensient Technologies*

but also on many developments that are beyond our control. To reduce our greenhouse gas emissions, we are working to improve the efficiency of our natural gas-powered dryers, rationalize our production processes and, in some cases, redesign our products. We are also working with the FDA to reassess the synthetic color certification process to allow the certification of liquid products, which would reduce dryer use, our largest contributor to Scope 2 GHG emissions.

We have incorporated sustainability considerations into our capital expenditure process. We will endeavor to remain careful to communicate when our ability to reach our goals may be contingent upon developments outside our control. Accordingly, while striving to reach net zero emissions in the future, we can only promise to do so once we can control that outcome.



Despite all these monumental challenges, our efforts and commitment continue. Our approach to sustainability is consistent with Sensient's clear strategy to create sustainable growth and long-term shareholder and stakeholder value. We will continue to build meaningful relationships with our business partners, offer more sustainable products, and scale circular business models.

**New Customer & Innovation Lab Opens**

Somerset, New Jersey, is home to Sensient's new customer and innovation lab. This 21,000-square-foot, state-of-the-art facility offers lab space and virtual interactive visualization and ingredient development studios to support beauty and personal care customers. Sensient built the facility to promote a collaborative R&D environment and help innovation thrive. The center will support beauty and personal care customers and savory flavor and extract customers. Innovation and application teams from both market segments will be at the facility.

One of Sensient's main priorities is to help our customers innovate more effectively to bring better products to market faster. This is why we expanded and improved customer collaboration labs in Europe and Asia over the past few years. We are excited to bring this latest facility online. We are sure its essential capabilities and features, including multiple lab spaces devoted to ingredient synthesis, analytics and applications, will foster creativity and spur innovation.

**Endemix Acquisition**

In 2022, Sensient acquired Endemix Doğal Maddeler A.Ş. (Endemix). Endemix, located in Turkey, is a vertically integrated natural color and extracts company serving the food and beverage markets.

The acquisition of Endemix allows us to expand our vertical integration for key natural colors and add extraction and refining capacity, further strengthening our position as a leading natural color solutions provider. It will also improve our supply chain and support the strong project wins we see in natural colors.

This acquisition also strengthens Sensient's extensive natural color portfolio capabilities and puts our operations closer to key botanical growing areas. A deal of this magnitude is a testament to Sensient's focus and commitment to providing natural solutions to support our customers in meeting demands for healthier, cleaner products.

**Investment in People**

Sensient is aware that our employees drive our continued global growth. Simply put, their success is our success. This is why the company remains committed to fostering a supportive environment that spurs professional growth and advancement.

> "We reflect our values inward as well as outward, resulting in a thriving and dynamic environment that celebrates our common humanity and dedication to the Sensient Corporate Creed."

From such basic core tenets as always telling the truth and an expectation of professional behavior to an unwavering commitment to safe, high-quality facilities that produce industry-leading products, Sensient is dedicated to furthering excellence. We reflect our values inward as well as outward, resulting in a thriving and dynamic environment that celebrates our common humanity and dedication to the Sensient Corporate Creed.

**New Products**

Sensient's new product development, or NPD, strategy focuses on consumer demand and market gaps. Often this falls into the ever-evolving wellness landscape.

- "New natural" is not going away—extracts with true-to-source flavor profiles take the investigation of new extraction technology.
- Generational trends like the sober curious movement, resulting in our SensaCraft Alcohol-Free Alcohol Type flavor platform, which provides all the tools manufacturers need to develop the perfect mocktail.
- Globally, regulations on sugar and sodium are becoming stricter. In order to meet guidelines and maintain taste profiles, new and more effective modulators will have to be developed.

**Responding to market forces, factors and trends**

Sensient doesn't operate in a vacuum. As a global enterprise, we are affected by market trends in multiple ways. We monitor shifts in trends across our global footprint to achieve the most streamlined operations while supporting staff and customers in every market.

## Inflation

It's anybody's guess how long inflation will affect global markets and the ups and downs it will bring in pricing. We continue to experience increases in our input costs, including raw materials, transportation, energy and labor.

We are addressing these rising input costs with disciplined pricing actions. While we have seen some signs of relief in select raw materials, most categories have remained elevated through the first quarter of 2023.

## Regulatory Updates

Our corporate legal team and our quality and regulatory teams continually monitor emerging regulations at the international, federal, state and local levels to understand the possible future implications. Our legal team follows emerging regulations relating to environmental, social and governance (ESG) disclosures to ensure we are prepared to comply if mandatory disclosure requirements go into effect.

There is a growing need for regulatory expertise to meet the changing consumer demands for plant-based products, increased certification types and greater expectations on the depth of information requested. Beauty customers lead the charge and keep asking for more and more supply chain transparency.

Stakeholder expectations concerning ESG matters have been, and continue to be, rapidly evolving and increasing. The enhanced regulatory focus on ESG matters requires us to monitor developing standards and reporting requirements and make continuous progress in our efforts to reduce our, as well as our suppliers, energy consumption, greenhouse gas emissions, water use and waste generation.

**FDA Approval for Butterfly Pea Flower Extract**

The wait is finally over for a heat-stable, natural blue food color. The U.S. Food and Drug Administration has approved Sensient Technologies' petition to add butterfly pea flower extract to the list of approved color additives.

Sensient's achievement, which required ultrafiltration and concentration of butterfly pea flower extract, allows manufacturers to close an important gap in the natural-color palette. This novel blue color is exceptionally heat stable and will enable food and beverage brands to achieve a range of shades, including bright blues, intense purples and natural greens.

The FDA approval covers a wide range of product categories, including sports drinks, carbonated soft drinks, fruit drinks, fruit and vegetable juices, alcoholic beverages, dairy drinks, teas, nutritional beverages, gums, candy, coated nuts, ice creams and yogurt.

The butterfly pea flower, also known as blue-pea, is native to equatorial Asia and found commonly throughout Southeast Asia. The petals have been used to make caffeine-free herbal tea for centuries. Artisan chefs often use butterfly pea flower to add vibrancy to their dishes. The color additive, by comparison, is considerably more complex to produce.

Closing the performance gap between FD&C colors and those from natural sources has long been a strategic priority for Sensient. The work on butterfly pea flower extract began over a decade ago and is a significant element of Sensient's "seed to shelf" agronomy program.

p&f+



perfumer & flavorist®

The Resource for Sensory & Wellness Innovation




## PerfumerFlavorist.com

Access the digital magazine, business solutions, industry trends, webcasts, podcasts, videos, educational tips, and more.

## *Perfumer & Flavorist* + Daily Newsletter

Get the latest on ingredients, new products, innovation, and breaking industry news.

## Facebook, Instagram and LinkedIn

Follow *Perfumer & Flavorist*+ to join the conversation.

Subscribe to *Perfumer & Flavorist*+ for FREE today!

go to www.PerfumerFlavorist.com/subscribe

# Symrise

**Holzminden, Germany**
**2022 Sales: €4,618.5 million**




*In 2022, Symrise purchased two companies–Groupe Néroli and SFA Romani–in southern France near Grasse, the world capital of perfume production.*

Consistent growth and investment in innovation across categories is one of Symrise's many strenghts. Thinking ahead, the company began a series A funding round for U.S. beauty incubator Ignite Venture Studio, allowing Symrise to expand investments in beauty/personal care startups, while driving fragrance and cosmetic ingredient innovation.

Speaking of investing in innovation, in May 2023, Symrise inaugurated The Little Red House, the company's Fine Fragrance Creation Hub in Shanghai. The hub is said to offer a space dedicated to market research, creative arts, and olfactory culture, featuring exclusive events and cultural programs.

The following insights are a collaborative effort by three voices from Symrise including CEO Hein-Jürgen Bertram, Ph.D., president, Scent & Care, Jörn Andreas, Ph.D., and president, Taste, Nutrition & Health, Jean-Yves Parisot, Ph.D.

**What was your company's biggest business accomplishment in the last year?**

Symrise has grown for the 17th year in a row. The 2022 fiscal year has proven successful also with major challenges. In 2022, we had to cope with some major challenges. The Russian war in the Ukraine, rising inflation and energy prices, and the lingering consequences of the COVID-19 pandemic. In this context, we managed to generate sales of €4,618 million. Sales increased by 20.7% in the reporting currency compared to the previous year. Excluding portfolio effects, organic sales growth amounted to 11.4%. At a total of €922 million, earnings before interest, taxes, depreciation, and amortization (EBITDA1) were significantly higher than the previous year's figure of €814 million. We achieved an EBITDA margin of 20% in a difficult environment, making us the most profitable company in the industry. Equally important we

consider the fact that we grew organically and at a faster pace than the competition, with a rate of 11.4%. We are therefore approaching our medium-term goals with confidence. By 2025, we plan to achieve annual growth of 5% to 7%, with profitability between 20% and 23%. By the end of the 2025 fiscal year, we plan to generate sales of €5.5 billion to €6.0 billion.

One reason for this lies in the group's long-term strategy based on the pillars of growth, portfolio, and efficiency. The company employs this strategy with many projects–for example, by skillfully acquiring companies, identifying new business units to add to those areas already established and relying more and more on the sustainable and efficient circular economy regarding raw materials and product developments.



*Hein-Jürgen Bertram, Ph.D., CEO, Symrise AG*

## DEVELOPMENT IN THE SEGMENTS AND REGIONS

### Taste, Nutrition & Health Segment

The Taste, Nutrition & Health segment saw a further normalization of consumer behavior in 2022 due to progress in the fight against the coronavirus pandemic. Furthermore, the implemented price increases exerted a positive effect on the segment's sales development. Considering portfolio and exchange rate effects, sales in the reporting currency amounted to €2,913 million. Compared to the previous year, this corresponds to an increase of 24.8%. Excluding currency and portfolio effects, the segment achieved organic growth of 15.3%. EBITDA Taste, Nutrition & Health: EBITDA1 of the Taste, Nutrition & Health segment amounted to €631 million in the reporting year, significantly higher than in the previous year (2021: €531 million).

The Food & Beverage division achieved high single to low double-digit percentage sales growth in all regions. In particular, the continued strong demand for beverages and savory products ensured high growth rates in the relevant business units across all regions. The confectionery business recorded slight sales growth, and the Naturals business unit also contributed to the increase in sales with single-digit growth. The Pet Food business continued its strong growth compared to the already excellent previous year. The development of the division benefited from an increasing pet population and the resulting high demand for pet food. The division achieved strong double-digit percentage organic sales growth in all regions.

### Scent & Care Segment

In the 2022 fiscal year, the Scent & Care segment generated sales of €1,706 million. Compared to the previous year, this represents an increase of 14.4%. Excluding portfolio and currency translation effects, organic sales growth amounted to 5.1%. The Fragrance division recorded solid organic growth in the single-digit percentage range and benefited from strong demand in the Fine Fragrances business unit. It delivered a very robust performance and once again achieved double-digit percentage organic growth following a strong previous year.

The growth rates in the Latin America and EAME regions looked particularly pronounced. The North America region reported significant growth. The Cosmetic Ingredients division continued its robust performance and benefited from the strong demand for high-quality cosmetic products. All business units and regions contributed to the business development. In particular, the strong demand for sun protection products and products with active cosmetic ingredients led to high organic growth in the double-digit percentage range. EBITDA Scent & Care: Scent & Care generated an EBITDA that was 3.0 % higher than in the previous year with €291 million in 2022 (2021: €283 million). The EBITDA margin amounted to 17.1%, due primarily to substantially higher prices for raw materials and energy (2021: 19.0%).

We increased our sales share in emerging markets by more than 40%. We pursue the goal to achieve 50% in them. We have also expanded our customer base by keeping our long-term goal in sight. We plan to maintain our balanced portfolio that equally

consists of global, regional, and local customers, whom we serve from our 100 sites worldwide. New sales channels such as online retail, that becomes increasingly important, form interesting options for our customers and for us.

We also work very sustainably. We protect nature and its biodiversity worldwide by responsibly purchasing raw materials and processing them sustainably, increasingly using circular economy methods. This is how we simultaneously protect the foundations of our business. In all five of our goal dimensions, we meet the requirements for non-financial corporate reporting regulated by the CSR Directive Implementation Act.

**What were your biggest technical advancements/ key acquisitions for the last year?**

Numerous acquisitions in recent years have contributed to growth at Symrise. We're always on the lookout for opportunities in fast-growing segments. We invested in the right places, including fine fragrances, which is experiencing double-digit growth again after the COVID-19 pandemic. We purchased two companies–Groupe Néroli and SFA Romani–in southern France near Grasse, the world capital of perfume production. With a combined 200 employees, the two former competitors will operate under the shared name SFA Néroli in the future and will be able to leverage enormous synergies. They develop and produce fragrance compositions for customers around the world, from the finest perfumes to household products, and jointly achieved sales of around €40 million in 2022. In addition, we will combine their extraordinary knowhow with our revived Maison Lautier brand, for which we will be building a new factory just a few hundred meters away at the same site.

As a result of the strong growth in Pet Food, we've expanded our capacities in China, North America, Brazil, and France and, with the acquisition of Schaffelaarbos and Wing Pet Food, have ensured even more diversity and depth in the portfolio. The Taste, Nutrition & Health segment, to which pet food belongs, has also experienced healthy growth, due in part to the fact that sales have increased, for example, in the Food & Beverage division. People are doing more in their free time and eating out more often.

In the Taste, Nutrition & Health segment, the research, and technology strategy is implemented based on various research platforms. Many key topics are being worked on with a special focus on sustainability aspects. In the Food & Beverage division, examples include the development and adaptation of new, gentle and environmentally



*Jörn Andreas, Ph.D., President, Scent & Care, Symrise AG*

friendly separation technologies (Selective Enrichment Technologies Flavors SETFlavors[a]) and the expansion and elaboration of raw material sources for sustainable and natural product solutions for the Symrise Code of Nature[b] platform, which are primarily used for healthy food concepts; the continuous development of natural and sustainable raw materials for flavor solutions that lead to the sensory-preferred reformulation of low-sugar, low-salt and low-fat food concepts; and the development of energy-efficient and low-solvent methods for concentration, beginning with plant-based raw materials. In 2022, a special focus was placed on the challenge of improving the taste of plant proteins as meat substitutes or for use in dairy products. Another focus is on reducing sugar in beverages and dairy products as well as in savory applications. In this context, the selection of varieties and new cultivation methods for a sustainable supply chain were developed and established for specific plant-based raw materials for the Taste Balancing product platform. Another focus of research in the Taste, Nutrition & Health segment is the development and application of modern digital tools for the rapid and targeted development of flavor solutions for selected food applications.

The ProtiScan[c] process–developed by Symrise for recording the flavor release from innovative food

[a]SETFlavors is a trademark of Symrise
[b]Symrise Code of Nature is a trademark of Symrise
[c]ProtiScan is a trademark of Symrise

preparations with vegetable protein–is noteworthy in this context. This process enables a significant reduction in project development times and forms a solid foundation for IT-based development concepts. In addition, work is being carried out on the continuous improvement of product safety and the targeted optimization of the use of flavor solutions for application in reduced sugar and plant protein-based foods. In recent years, particular attention has been given to the development of digital prediction tools to support flavor development and creation. A significant portion of this work has been completed this year and grouped under the umbrella term PropheSY.

In the Pet Food division, the Elven site was equipped with state-of-the-art extrusion equipment to develop more powerful and safer products. In addition, the VIDEKA[d] laboratory in Elven was designed for EAME customer support with shelf-life studies, research and development and analytical requirements. This laboratory is used to carry out shelf-life studies for pet food and pet care compounds using the latest analytical instruments.

Regarding its R&D strategy, the Scent & Care segment focuses on raw materials and technologies in accordance with the strategic research fields of efficiency, sustainability and naturals, and health and emotion. Green chemistry is also an important factor when it comes to perfumery. Products are produced based on natural renewable raw materials. For example, with the Garden Lab, a disruptive approach was taken using the SymTrap[e] process to make vegetable scents accessible for perfumery as well. The SymTrap platform was also expanded with additional products in 2022. In the field of extraction from natural raw materials, new qualities were developed and included in the perfumery range. Supported by R&D, the range of natural raw materials will be expanded further with the launch of La Maison Lautier. New and sustainable captives have also been developed. Among them is Pearadise[f], which is produced based on biotechnologically derived raw materials and using green chemistry. With Flowerpool[g], a captive was developed that smells of white blossoms and purity.

Diviniris is an iris-scented captive with velvety notes. Research is also being carried out to find inexpensive raw materials for perfumery. Symrise has also added Natural Neofresh[h] to its Neofresh platform to meet customers' desire for sustainable products made from renewable raw materials. The

[d]VIDEKA is a trademark of Symrise
[e]SymTrap is a trademark of Symrise
[f]Pearadise is a trademark of Symrise
[g]Flowerpool is a trademark of Symrise
[h]Neofresh is a trademark of Symrise



*Jean-Yves Parisot, Ph.D., President Taste, Nutrition & Health, Symrise AG*

addition of substance mixtures, especially for fine fragrances, makes it considerably more difficult for our competitors to analyze and replicate our perfume oils. The new Cryptosym[i] technology was very well received by some customers.

By combining the expertise of Symrise in fragrance development with that of Pet Food, the product category was further developed specifically for dogs and cats. The marketing of Symcap BG[j] biodegradable capsules has generated a great deal of interest in fabric softeners from some customers. Research for capsules for fragrance oils is now heading to vegan capsules with improved efficacy for other areas of application as well. In Oral Care, a new product was developed that combines bio-technological processes with knowledge of probiotic active ingredients. The research for new cooling agents for mouthwash, toothpaste and products for oral health was ramped up. A total of five research platforms exist in the areas of cosmetic ingredients, encapsulation and release systems for perfumery, green chemistry for sustainable products, bad odor management and oral care. Supporting platforms in the areas of sensory and analytical research, raw materials and by-products from sustainable sources, performance, and receptor re-search form the basis for the capabilities at Symrise and for a constant innovation process. Newly developed technologies support the understanding of perfume oils in terms of long-lasting fragrance experiences and blooming effects. In the Cosmetic Ingredients division, there is an

[i]Cryptosym is a trademark of Symrise
[j]Symcap BG is a trademark of Symrise

interdisciplinary group of cell biologists, molecular biologists and microbiologists re-searching the human microbiome. The new research area is investigating the benefits and risks of interactions between humans and microorganisms and is providing scientific and cross-divisional support in the development of new products for skin, scalp, and oral care, or in nutrition. The first products and product concepts have already been introduced to the market. In addition, in-depth analyses on healthy volunteers showed that neither multifunctional active ingredients nor modern UV filters influence the microbiome. Furthermore, the portfolio of biotic ingredients was expanded to include the product SymFerment[k]. This is a postbiotic skin care ingredient with hydration boosting properties. It is made from a process involving the use of a by-product derived from the probiotic production of special lactobacilli that are rich in micronutrients. In 2022, as in previous years, Symrise research was recognized with awards for its high level of innovation. For example, Symrise received a European BSB Innovation Award for SymFerment as an innovative cosmetic raw material in the raw materials category (moisturization and barrier). This is a post-biotic, which is obtained from the byproduct of the probiotic production process and has been shown to improve skin hydration. The product was introduced to the market in 2022. SymHair[l] Thermo was also launched in 2022: This product combining carbohydrates of different chain lengths provides excellent protection for the hair against heat damage. In addition to the good activity data, the BSB Innovation Award jury was also impressed by the composition of the product made with ingredients of natural origin and presented it with an award in the natural raw materials category within the Hair Care Actives segment. The product Hydrolite[m] 7 green launched in 2021 once again received an award for its innovative and sustainable technology: The BSB Innovation Award in the functionals section of the raw materials category. Hydrolite 7 green is a multifunctional cosmetic raw material produced based on the principles of green chemistry. It is applicable in a wide range of products and characterized by its properties of enhancing antioxidants and solubilizers as well as proving product protection.

At the beginning of the year, Symrise expanded the fragrance ingredient production facility in Granada, Spain, which was acquired in 2021. As a first step, Symrise made a targeted investment in multifunctional cosmetic ingredients, an event which

> “We invested in the right places, including fine fragrances, which is experiencing double-digit growth again after the COVID-19 pandemic.”

particularly reflected the growth in the global market for 1,2-alkanediols. The 1,2-alkanediol product range from Symrise consists of several multifunctional ingredients that are becoming increasingly popular in personal care products. With the recently commissioned production line, the site now provides both cosmetic ingredients as well as a wide range of fragrances from renewable raw materials.

Symrise presented its enhanced artificial intelligence (AI) system, Philyra, at the *World Perfumery Congress* in Miami at the end of June 2022. Philyra–the name stems from Greek mythology and represents creation support–enhances the creative work of perfumers with sustainable facets. Over the past few years, Symrise has collaborated with IBM Research on evolving its cognitive creativity based on AI in perfumery. Philyra 2.0 makes it possible for perfumers to create innovative fragrance creations with environmentally friendly and renewable raw materials. The AI system reinforces the position of Symrise as a digital trailblazer in the industry. In December, the Taste, Nutrition & Health segment established a four-year research consortium with the Dutch Wageningen University & Research Institute and other industry partners. The purpose of the partnership is to develop meat alternatives with improved sensory quality. The partners want to focus on investigating the factors which affect the taste of meat alternatives. More and more consumers are turning to plant-based versions of popular meat products. And while the market is growing exponentially, it still offers considerable potential when it comes to developing new products. The research will provide the food industry with findings on how to create tastier alternatives for meat products–an important step on the path to more sustainable nutrition with more plant-based products. As part of

[k]SymFerment is a trademark of Symrise
[l]SymHair is a trademark of Symrise
[m]Hydrolite is a trademark of Symrise




*In 2022, a special focus was placed on the challenge of improving the taste of plant proteins as meat substitutes or for use in dairy products.*

its portfolio management, Symrise was also active in the market for acquisitions and disposals in the 2022 fiscal year.

**What are the key factors/trends shaping innovation in F&F in 2023?**

## Biodiversity

We purchase around 10,000 raw materials throughout all the company's divisions. We can improve efficiency significantly by optimizing procurement with an increase in cross-divisional thinking. At the same time, we plan to acquire our raw materials in accordance with the highest sustainability standards. This is an issue that goes far beyond high levels of quality, as biodiversity plays a key role throughout the entire process. We continue to promote backward integration and are working closely with partners throughout the value chain. Just like time and staff, raw materials are in short supply, which is what makes the circular economy even more important.

## Circular Economy

We follow the principles of the circular economy throughout our entire portfolio of raw materials and products. There are so many raw material processes in which valuable materials go unused. We want to use 100 % of raw materials wherever possible and thus use our natural resources much more efficiently, which will also allow us to avoid traditional recycling in many areas.

For instance, we use the principles of the circular economy at Schaffelaarbos in the Taste, Nutrition & Health segment. We successfully implement similar business models there with by-products from meat production. Another example: Thanks to innovative methods, we can also use by-products from orange and sugar cane processing in the Scent & Care segment, resulting in many products that are renewable and biodegradable. And this extends to many other areas as well.

## $CO_2$-Neutral

Our approaches are sustainable in many areas of the group and help us to continuously reduce our $CO_2$ emissions. That will allow us to be climate-positive in energy supply and consumption by 2030 and climate-neutral throughout the supply chain by 2045. This way, we can continue our recipe for success, with sustainable business processes that benefit people and animals, the climate, and the environment, while guaranteeing economic success.

**Could you share your insights on the impacts of evolving regulatory updates?**

## Supply Chain Due Diligence Law (LKSG)

With the implementation of the Supply Chain Due Diligence Law (LKSG) which became binding for Symrise in Germany in 2023, far-reaching obligations have now been set for us. We gladly intend to observe them to increase transparency along the supply chain and bolster our efforts to protect people and the environment while considering the interests of the company. Furthermore, we can also fulfill the sustainability requirements of our customers concerning our products, for example, regarding $CO_2$ emissions, their origin, cultivation or production practices and water use.

## German Supply Chain Act

The German Supply Chain Act has been in place since the beginning of 2023, and we must meet its requirements as of this year. We will need to report on our risks and remedial measures at the beginning of 2024. But we are already assuming responsibility for our suppliers concerning, for example, the observance of internationally recognized human rights and certain environmental standards. That's no small feat considering we work with more than 15,000 direct and indirect suppliers worldwide. We expect the supply chain act to be enacted at the EU level in late 2023, which is likely to contain more stringent requirements and will need to be translated into national law within a period of two years. We began with the introduction of a systematic process in 2021 that will allow us to identify human rights and environmental risks on our suppliers' side. Also, the Executive Board published the human rights policy statement at the beginning of last year. We also published guidelines on responsible sourcing and the Code of Conduct for suppliers in the middle of last year.

## EU Taxonomy

The European Union is introducing a new classification system with the EU taxonomy that defines environmentally sustainable business activities. Starting in 2022, companies will have to demonstrate how they take account of two environmental targets in their production technologies or investments, and a total of six targets starting in 2023. This pertains to environmental and to social issues.

The EU taxonomy forms a part of the "European Green Deal," which aims to make the EU the world's first carbon-neutral economy by 2050. It aims to direct private and public investments so that they finance the transformation to a sustainable economy.

> "We follow the principles of the circular economy throughout our entire portfolio of raw materials and products."

For Symrise, the EU taxonomy is a good approach to this. With its precise definitions, it provides a specific roadmap for how the European economy can become more sustainable. The development of the taxonomy is far from complete. So far, the EU has defined six overarching environmental targets, only the first two of which have been given precise criteria:

1. Climate change mitigation
2. Climate change adaptation
3. The sustainable use and protection of water and marine resources
4. The transition to a circular economy
5. Pollution prevention and control
6. The protection and restoration of biodiversity and ecosystems

Further environmental targets will follow in the coming years, as will a social taxonomy with targets in areas such as education and health. Only then all sustainability topics will be covered by the taxonomy, which Symrise summarizes under its pillars "footprint," "sourcing," "innovation" and "care."

## Taxonomy Eligible vs. Taxonomy Aligned

For the taxonomy, companies must first indicate whether they have taxonomy eligible economic activities. "Taxonomy eligible" means that the activity potentially contributes most to the achievement of the six environmental targets. It must then be verified whether these are taxonomy aligned–i.e., ecologically sustainable according to the criteria. To do this, they must comply with three central principles:

1. Significant contribution: Companies must make a significant and measurable contribution to at least one of the environmental targets based on the specific criteria.

2. Do no significant harm: The "Do no significant harm" principle (DNSH) applies to each target regarding the five others–climate change mitigation, for example, should not be ensured at the expense of species preservation.
3. Minimum social standards: Before the social taxonomy is adopted, it should be ensured that the taxonomy eligible activities do not violate any minimum social standards–such as the OECD Guidelines for Multinational Enterprises or the UN Guiding Principles on Business and Human Rights.

## Influence on Symrise

The EU taxonomy fits the company's activities. We have been reporting on our sustainability performance for more than ten years in accordance with all relevant standards, which we see as a guideline and a learning field. Symrise therefore considers a uniform definition of the conditions under which economic activities are considered sustainable to be useful and helpful. The taxonomy now creates more comparability.

## EU Taxonomy Integration and Results

The regulation lists only those activities that can potentially make the greatest contribution to the six EU environmental targets. Symrise carries 2 % in taxonomy eligible sales or 8 % in taxonomy eligible capital expenditures in the books. However, this says little about the sustainability of the Group. "We are more interested in the difference between taxonomy eligibility and alignment. If it is small, this indicates a comparatively high degree of environmental compatibility in business and investment activities. One reason why this difference tends to be small at Symrise is that the company relies on the ISO 14001 standard for its environmental management system and uses SMETA, an audit standard from the Sedex organization, to demonstrate compliance with human rights, environment, health, occupational safety, and business ethics requirements.

In the 2022 fiscal year, approximately 2% of annual sales and 3% of operating expenses at Symrise were taxonomy eligible and aligned. Of the capital expenditures made (CapEx), 8% were taxonomy eligible and 6% were taxonomy aligned (for detailed information. They all supported environmental target 1, "Climate change mitigation."

"Based on our deep integration of taxonomy standards in all areas, we try to make our activities as sustainably measurable and transparent as possible. This will also be reflected positively in the future," chief sustainability officer Bernhard Kott is certain. "In particular, the environmental targets of 'Transition to a circular economy' and 'Protection and restoration of biodiversity and ecosystems' are highly relevant to us."

p&f+





# We'll Save You a Seat for 2023!

perfumer & flavorist

flavorcon®

The Sensory Event for Flavor Leaders

**November 8-9, 2023**
Duke Energy Convention Center
Cincinnati, Ohio

# Takasago

**Tokyo, Japan**
**2022 Sales: ¥186,792 million**

Research and development are two cornerstones of Takasago's legacy. With its corporate mission, "Create new value through innovation rooted in kaori (aroma in Japanese)" and Vision 2040, "Care for People, Respect the Environment," it has consistently built up its research and development capabilities to develop innovative flavors and fragrances which meet the needs of customers and consumers. In 2022, the company debuted two laboratories, the Molecular Transformation Laboratory and the Biodesign Laboratory. Moreover, in the changing research environment with significant advances in IT technology and open innovation, Takasago purchased a business site in Kamakura, Kanagawa Prefecture in 2022. Takasago has determined that a new core facility is needed to achieve further growth as globally expanding Takasago Group's Center of Excellence. The construction of this facility is planned to be completed by 2028.

In the pages ahead, Takasago president and CEO Satoshi Masumura speaks to how recent trends and obstacles inform the company's latest developments and strategies in this year's Leaders & Newsmakers issue.



*With the focus on sustainable research and development, Takasago has recently established the Molecular Transformation Laboratory as well as the Biodesign Laboratory.*

## Satoshi Masumura

President and CEO, Takasago

**What was your company's biggest business accomplishment in the last year?**

FY 2022 was the second year of the New Global Plan-1, which is Takasago group's mid-term management plan over three years. As part of our efforts to establish a global management foundation, we worked across divisions and organizations on priority issues that should be addressed such as introduction of core systems at our overseas bases, the study of a production systems based on strategy for synthetic chemistry, the improvement of the efficiency of manufacturing processes, Sustainable Development Goals (SDGs) and research and development using advanced sciences.

With the focus on sustainable research and development, we have newly established the Molecular Transformation Laboratory and the Biodesign Laboratory. The Molecular Transformation Laboratory conducts research and development on organic synthesis using natural and bio-derived raw materials while the Biodesign Laboratory is focusing on synthetic biology, including fermentation and the use of smart cells. In addition, we are also preparing for the construction of a new building with the relocation of the research and development center, which has already been announced in 2022.

[a]TVRSE is a trademark of Takasago

Despite COVID-19 infections continued to affect all aspects of our lives in 2022, our business environment is gradually changing during the transition to the new normal when people must live with COVID. Looking at the global situation, there were many concerns, including the energy market turmoil triggered by Russia's military invasion of Ukraine, the economic impact of the trade friction between United States and China, global inflation and exchange rate fluctuations.

Against this backdrop, the group's business performance showed solid sales and operating income which are almost as much as planned. Sales of the Beverage segment for flavors and Air Care Product segment for fragrances remained strong, and there was also a recovery in sales for Fine Fragrances and other products. Fine Chemicals, mainly pharmaceutical intermediates, also performed well. We also promoted the solutions to respond appropriately to product needs arising from new normal lifestyles and to address growing health and environmental concerns.

We believe that our efforts to develop and manufacture safe and reliable flavors and fragrances under our corporate mission, "Create new value



*Satoshi Masumura, President and CEO, Takasago*



through innovation rooted in kaori[b]," and Vision 2040, "Care for People, Respect the Environment" were major achievements in the continued growth of our sales.

**What were your biggest technical advancements/ key acquisitions for the last year?**

We regard biotechnology as one of the key technologies for promoting green chemistry, and manufacturing with biotechnology is a promising field to develop in the future because it can pursue the dual goals of industrial development and solving social issues. With the support of the NEDO project, we are actively working on the use of biotechnology. We aim to develop more environmentally friendly and value-added products by combining biotechnology with terpene synthesis technology and continuous flow technology in which we have many years of experience and expertise.

Under the BioSwitch[b] concept, we are actively developing products that switch from limited fossil raw materials to renewable raw materials. With our vision, "respect the environment," we are also focusing on developing products that are biodegradable.

In addition, from the perspective of developing products that are conscious of biodiversity, we are searching for and identifying components that contribute to the aroma of natural raw materials to develop flavors in order to reduce our dependence on natural raw materials.

In developing the flavor using retronasal aroma analysis, we have expanded our line-ups and launched a brand called Vivid Flavors[c] Retroma[d] which are designed to give authenticity and true-to-nature aroma while eating and drinking.

We are also doing research and development to impart the authentic and delicious taste to plant-based food in response to health consciousness, mitigation of global warming, food shortages, water resources protection, etc. We have launched the concept of Shoji[e] to solve the issues of plant-based food and have started introducing it to our customers.

Regarding process development, as part of our efforts to address the global challenges of the SDGs including climate change, we are promoting environmentally friendly research and development with green chemistry in mind and are focusing on process innovation using catalysts and flows to achieve sustainable manufacturing processes. We are also working on the development of a new process

> "We aim to develop more environmentally friendly and value-added products by combining biotechnology with terpene synthesis technology."

to produce green chemicals. As part of this initiative, we have developed an environmentally friendly synthesis process and are building a manufacturing process that is safer and more environmentally friendly than conventional processes.

We also developed a new ruthenium catalyst (Ru-MACHO[f]-BH) to synthesize sugar alcohols from sugar. This is the first report of highly selective synthesis of disaccharides in the world.

Although there were no acquisitions in FY2022, we are proceeding with a multifaceted study of the necessary synergies, including those to be achieved through collaboration and merging and acquisition.

**What are the key factors/trends shaping innovation in F&F in 2023?**

For flavor, health and well-being continue to be keywords for both physical and mental health as the world's food and beverage market is in a hurry to recover from the pandemic.

Consumers are appealing to healthy lifestyles while health-conscious food and beverage products are being developed. All kinds of functional ingredients are being tested, and products are being designed which even connect to the consumer's mood. Our flavor team is actively promoting flavor creation that is conscious of product character in addition to improving the taste of the product.

Dairy alternatives and meat/seafood alternatives are growing rapidly with different requirements in different countries and regions. Expectations for

[b]BioSwitch is a registered trademark of Takasago
[c]Vivid Flavors is a registered trademark of Takasago
[d]Retroma is a registered trademark of Takasago
[e]Shojin is a registered trademark of Takasago
[f]Ru-MACHO is a registered trademark of Takasago

flavor creation that matches local tastes are high. In order to meet customer demands for flavor which could deliver authenticity and masking function, we are actively developing ingredients/flavors.

In terms of consumer generations, we are focusing on Gen Z, which is said to account for 26% of the total population, Generation α, and seniors aged 65 and over. It is obvious that these generational groups will have a significant impact on food & beverage preferences and product design. We will carefully scrutinize their expectations towards flavor and link them to our flavor development.

Amid soaring energy costs and raw material prices triggered by the Russia-Ukraine issue, competition in the industry is expected to intensify further. We believe that it is important to grasp consumer needs that change with the times, and to develop and sell products that meet those needs.

In the fragrance industry in 2023, the key drivers of innovation remain sustainability and the post COVID reality of consumers seeking elevated benefits in their health and well-being. Today fragrances need to be designed to support a range of sustainability principles. These can encompass the application of green chemistry, to the auditability of supply chains where key materials can be sourced in full transparency. We can now declare individual characteristics of each fragrance, from biodegradability to carbon footprint and it is this factor that is shaping much of the innovation in the industry. We are looking at the development of key aroma ingredients in a totally different way from the past. The industry is shifting away from petroleum-based chemistry and is pursuing other chemistries which harness biotechnology or plant-based feedstocks. This will continue as we create fragrances that support the overall product proposition of 'Care for People, Respect the Environment.'

In the post-COVID era, we are increasingly developing fragrances to support key emerging trends from the pandemic. Namely, fragrances which can enhance the overall hygiene properties of a product as the safety and well-being of family members remains paramount. Utilizing fragrance ingredients to inhibit bacterial growth or convey heightened freshness and hygiene remains critical and this will continue for the foreseeable future. Societal stress is also a factor which is driving innovation as the global marketplace deals with the fall-out of the pandemic. Inflationary pressures, economic slowdown and the general market volatility has caused a profound consumer reaction. Fragrances now need to deliver emotional benefits such as alleviating stress, inducing better quality sleep or providing escapism from the challenges of the day. This is a key challenge for the industry as we look to deliver greater emotional benefits that can be quantified and have a real impact on the daily lives of consumers.

Moreover, the industry is facing significant economic headwinds associated with raw material price increases and general availability. These adverse trading conditions will drive efficiency savings and provoke innovation as the industry focuses on cost and supply. We will need to deliver more cost-effective solutions, constantly evolve delivery systems such as fragrance encapsulation to deliver more fragrance with less. New sources of supply will need to be established and a renewed focus on supply chain resilience will be an innovation space in 2023 and beyond.

For Aroma Ingredients, the key trends are "value-added flavors and fragrances" and SDGs. As consumers become more educated and health conscious, flavors and fragrances that fulfil the expectation of taste and smell is no longer sufficient. Therefore, the F&F industry would trend towards introducing products with added health benefits or healthy for consumption. This market segment where flavour or fragrances has additional functional benefits would continue to grow significantly as the world population continue to age.

SDGs in which one of the key elements is the protection of environment. In this aspect we expect to see more investments in F&F industry in biotechnology which reduce dependency on non-renewables raw materials and reduces carbon footprint. In addition, biotechnology could contribute to less pollutant and a safer working environment.

Overall, both the above factors would benefit greatly the F&F industry as the industry would be forced to continue innovating and move into a brighter future.

**Would you share your insights on the impacts of evolving regulatory updates?**

In the fragrance realm, 2023 marks the 50th anniversary of the International Fragrance Association (IFRA). IFRA, together with Research Institute of Fragrance Materials (RIFM), has been working for half a century to ensure the safety and reliability of fragrances, and Takasago has been involved in the IFRA since its inception. The 51st Amendment to IFRA is scheduled to be officially issued by the end of this year. Takasago will continue to work hard to ensure the safety and reliability of fragrances by firmly promoting this amendment.

The EU's CSS (Chemical Substances Strategy), represented by the term "Green Deal," is a huge and far-reaching trend that involves not only the fragrance industry but also all industrial sectors

once every 100 years or more and is having a global impact. In the direction of hazard-based regulation, the first specific case that became an issue was BMHCA (trademark name Lilial), which was classified as reproductive toxicity 1B and banned in cosmetics and is now on its way to being banned in other products as well. This has led to a ban in the ASEAN Cosmetics Directive, which is also affecting other countries. Such cases are expected to increase in the future. On the institutional level, the amendment of the CLP Regulation will almost certainly lead to the introduction of new classifications such as "Endocrine Disruption," and the EU is also trying to globalize this trend by lobbying the United Nations and other organizations. On the other hand, there are many Asian countries where chemical substance regulations are not yet in place, and in India, new chemical substance regulations are expected to be enacted this year, so we are paying close attention.

As for flavor, global movements such as sugar and salt reduction has led to the introduction of warning labels in many countries. As food companies are reviewing their product formulations to avoid giving consumers a bad impression due to labeling, business opportunities in flavor industry are expanding including the development and addition of flavor with new functions to compensate for the lack of substance caused by reduced sugar and salt. On the other hand, in Europe, for example, regulations on enzymes to be used or stricter registration requirements for new flavor ingredients are increasing, making it more difficult to develop new ingredients that can be used globally.

In addition, it is becoming increasingly likely that regulations other than FL and food additives will extend to FL regulations, such as problems stemming from contamination of pharmaceuticals have spilled over into the regulation of food ingredients, the problem of pesticide residues has extended to the management of flavor or, as mentioned by the FR side, concerns have arisen that tighter regulation of chemicals will lead to disclosure of information on ingredients, etc.

p&f+



perfumer & flavorist®

The Resource for Sensory & Wellness Innovation

# Tune In!



*Perfumer & Flavorist+*

## Multimedia

www.perfumerflavorist.com/multimedia

# T. Hasegawa

**Tokyo, Japan**
**2022 Sales: ¥62,398 million[a]**




*Last year T. Hasegawa achieved the highest globally consolidated sales and net income in the company's history.*

Flavor forward thinking is what keeps T. Hasegawa in the zone of innovation. With an emphasis on flavor modulator technology launches and an investment in trend research, T. Hasegawa aims to be at the forefront of the future of flavor. From key acquisitions and launches to overcoming challenges on a global scale, the company's CEO Tom Damiano returns to this year's Leaders & Newsmakers issue to discuss key factors in T. Hasegawa's most profitable year to date.

[a]For fiscal year ending September 30, 2022

## Takao Umino

President and COO, T. Hasegawa Co., Ltd.

## Tom Damiano

CEO, T. Hasegawa USA, Inc.

**What was your company's biggest business accomplishment in the last year?**

There have been numerous accomplishments over the past year that have grown T. Hasegawa's business globally and continue to strengthen our operations,

expand our capabilities, increase capacity and introduce new technologies that advance the science of flavor development.

Last year achieved the highest globally consolidated sales and net income in our company's history, but it wasn't without challenges. Like the rest of the industry, we faced difficult circumstances as the global market transitioned out of the pandemic and faced new economic concerns such as supply chain issues and U.S. inflation. However, based on the principles, sales from non-consolidated global subsidiaries, including T. Hasegawa USA, remain strong.

Globally, there were challenges such as the temporary closure of our facility in China due to COVID-19, while there were not huge impacts in other regions. Other global factors, such as the prolonged situation in Ukraine, the soaring cost of raw materials and resources along with a harsh depreciation of Japanese yen toward the U.S. dollar have presented challenging circumstances for our executive management team. Despite these unexpected challenges, we have overcome each challenge to expand flavor and fragrance sales, secure profits in Japan and grow in the U.S. and Asian markets by remaining flexible and strategic in our management while aligning with customer demand to execute effectively. As a result, our financial results remained steadfast with global consolidated sales hitting the highest for two fiscal years straight, due to the increasing sales of non-consolidated and T. Hasegawa USA. Sales from global subsidiaries outside of Japan, including T. Hasegawa USA, increased from 41.4% to 45.9% last year.

In 2021, T. Hasegawa USA expanded its reach in the U.S. market by acquiring Mission Flavors and Fragrances, Inc. in California. This acquisition aimed to better serve customers with a broader range of flavors within dairy, bakery, plant-based meat alternatives, fruit-filling and confectionery categories. A seamless post-merger integration period, after acquiring Mission Flavors in December 2020, was fully completed at the end of September 2021 as originally planned, and by the end of FY2022, Mission Flavors had made a full fiscal year contribution to our sales results. This first full year realized the synergies of both companies and collectively grew our business in the United States. Mission Flavors' greatest strength was in sweet and beverage flavors. As a result, T. Hasegawa USA was able to expand sales to existing Mission Flavors customers and fully leverage the capabilities and product offerings of each company. Overall, by synergizing capabilities and technology from both T. Hasegawa and Mission Flavors, we are providing our customers with the value proposition of comprehensive



*Takao Umino, President and COO, T. Hasegawa Co., Ltd.*



*Tom Damiano, CEO, T. Hasegawa USA, Inc.*

category expertise, expanded flavor options, flavor modulation solutions, organic certified flavors and increased speed-to-market.

Last year, T. Hasegawa USA purchased a new state-of-the-art manufacturing facility in Rancho Cucamonga, California with the aim of building a new production system in the United States. Specifically, this facility increases production of liquid and spray dry capacities, to meet rising demand for sweet flavors. The first phase of



*In 2022 T. Hasegawa USA purchased a state-of-the-art manufacturing facility in Rancho Cucamonga, California.*

construction was completed as scheduled in 2022, and we opened this facility last summer and began operation. This new facility represents an expansion that is already generating positive top-line growth quickly while maintaining our long-term vision to boost production capacity and benefit from increased scale–all of which are bolstering our innovation of sweet flavors. The new Rancho Cucamonga facility provides a foundation for existing manufacturing capabilities, and a source of growth for our business in the future. Our current facilities in Cerritos, California continue to serve as an R&D innovation center and manufacturer of savory flavors while we expand our flavor development and applications footprint with additional chemist labs and state-of-the-art equipment.

While new acquisitions grow our sales with increasing our product portfolio, and new manufacturing facilities expand our production capabilities, the talented team remains the heart of T. Hasegawa. Our world-class flavor experts, R&D staff, sales personnel, production managers and customer service team are a key part of our omnichannel strategy to drive better customer relationships and broaden our unparalleled flavor offerings and applications. One of T. Hasegawa's key strengths is interfacing with our customers–our employees are passionate about helping our customers succeed by solving problems, maintaining open communication and becoming a true partner that helps develop effective food and beverage flavor solutions.

**What were your biggest technical advancements/ key acquisitions for the last year?**

Technical innovations are the driving force of our business at T. Hasegawa. We strive to continually offer new flavor modulation programs and develop unique technologies that advance the field of flavor modulation.

Much of our technical advancements have origins in Japan, as part of our "Bridge to Tokyo" flavor development program. In this unique coordination, new technologies and flavor profiles are initiated by T. Hasegawa's R&D team in Japan and further refined by T. Hasegawa USA to introduce new flavors in the Western market.

In recent years, T. Hasegawa introduced several new lines of technical innovations targeting accelerated revenue growth, along with refining existing technologies like sweetness enhancers,

fruit enhancers and masking capabilities. Two of the most significant technologies in recent years were the launch of Boostract[b] and EmulsiTract[c] flavor modulators.

Boostract is a novel flavor modifier that revolutionizes the way consumers experience food and beverages. Boostract adds or enhances kokumi (which translates to "rich taste" in Japanese), increasing the richness of taste while maintaining balance between different flavors. This exclusive technology by T. Hasegawa allows us to help food and beverage brands deliver a consistent experience to consumers, enhancing the existing flavor profile while amplifying the mouthfeel, taste and texture. Boostract has also proven to be an effective masking agent, eliminating unwanted flavor notes in select food products while boosting the desired flavors in others. The positive response from our customers to this new technology has been overwhelming. Some of the world's biggest food and beverage brands have been impressed with the capabilities of Boostract and are actively using this technology in new product development and reinvigorating existing product lines.

EmulsiTract is a proprietary fat mimetic technology that creates a thick, creamy sensation by combining edible fats and oils with components that enhance other flavors. This technology has a particle size close to traditional dairy milk, which provides functionality, thickness and richness to product lines where milk fat or fat replacers are often sought after to create a better augmented texture. A significant feature of EmulsiTract is that this cutting-edge natural flavor modifier can limit the dependency on palm oil and other edible oils. Considering the supply chain challenges of edible oils of the past couple years, and the drastic increase in cost for palm oil, our customers are finding that EmulsiTract is providing an economical solution in the form of oil reduction and/or cost-in-use alleviation. EmulsiTract is very effective in the development of plant-based protein products–a category that continues to grow each year.

This year we are also pleased to introduce Hasearoma[d] and ChefAroma[e]–two innovative new flavor enhancer technologies designed to create more authentic taste experiences.

[b]BOOSTRACT is a trademark for T. Hasegawa
[c]EmulsiTRACT is a trademark of T. Hasegawa

[d]HASEAROMA is a trademark of T. Hasegawa
[e]ChefAroma is a trademark of T. Hasegawa




*Two of the most significant technologies in recent years by T. Hasegawa were the launch of Boostract and EmulsiTract flavor modulators.*

Hasearoma is a proprietary research and enhancement technology that creates authentic sweet and savory flavors through an extensive sensory analysis process which isolates specific flavor molecules within foods and beverages. In many cases, the process for developing a new flavor with Hasearoma can take up to 12-months, but the result is a wholly authentic flavor experience that is true to nature's essence. Hasearoma aims to reproduce that "first bite" sensation that we experience biting into a food for the first time, packed with intricacy and nuances of flavor. The unique process and technology of Hasearoma enables a higher level of specificity than other compounded flavors. For example, many brands in the past may have opted for a basic mango, peach or orange flavor in product development, but Hasearoma can reproduce the specific flavor profile of an Alphonso mango or Ataulfo mango, a White peach or Golden Jubilee peach and a Clementine orange versus a Navel orange. This level of specificity and authentic flavor can really elevate a product being developed to stand out within the market and deliver a more "true-to-nature's essence" taste experience. The benefits of Hasearoma aren't limited to fruits and other sweet flavors, and there are also exciting applications in savory flavor development. For example, with this technology, we can replicate the distinct depth of flavor that you get through cooking applications, such as refining an onion jam to taste caramelized instead of sauteed. Hasearoma can deliver flavor specificity in savory applications, such as differentiating between the flavor of chicken thigh or chicken breast versus chicken skin and importantly, doing so without the use of any animal products, creating a unique type of flavor replicating the original taste. With the immense growth of vegetarian and vegan diets in North America, savory flavor technology like Hasearoma will make a positive impact in coming years, allowing us to refine and replicate the authentic flavors of specific cuts and types of meats like chicken, duck and wagyu beef.

Our applications team is hard at work discovering new sweet and savory applications for Hasearoma. Currently, our most popular applications are in snacks (e.g., pineapple jalapeno flavored almonds) and beverage (e.g., pink grapefruit sparkling water), but the possibilities are endless, and we will be working with customers to discover more opportunities from sports nutrition, energy bars, soups and prepared meals.

While Hasearoma replicates the authentic taste of nature in both savory and sweet flavors, this year we also launched ChefAroma as a new technology designed to deliver chef-inspired flavors in less time, providing a rich complex flavor that is true to original culinary recipes. Targeted to foodservice applications, ChefAroma uses reaction flavor technology and real food ingredients like butter, onion and wine to add complexity with an intensity to otherwise mundane foods. For example, ChefAroma can cut down on the prep time and be added as a base for a variety of soups/broths, condiments, glazes and other dishes to instantly deliver the distinct taste of restaurant quality flavors that have been cooking for hours, saving restaurants time and money. ChefAroma flavors can also be added to ready-prepared frozen meals, to deliver a complex flavor experience after re-heating. Available in four different flavors (Wine Butter, French Onion Soup, Butter Onion and Mirepoix), ChefAroma offers cost optimization and delivers consistent quality of flavor at scale utilizing real food ingredients, such as butter, meat, poultry, vegetables, onion and wine, the higher flavor complexity creates more impact for your dish, ultimately reducing costs and cutting down on preparation time in the kitchen, without compromising on the flavor. This unique technology was initially developed by T. Hasegawa in Japan and refined by our United States team for introduction in the Western market.

> "We strive to continually offer new flavor modulation programs and develop unique technologies that advance the field of flavor modulation."

New technologies are the foundation of what we do at T. Hasegawa, and we remain committed to innovation by continually expanding, improving, and customizing new technologies to create more authentically flavored beverages, snacks, bakery products, soups, sauces, dressings and more. Our customers have consistently been impressed with our

applications prototypes and how our new technologies improve their products and even demonstrate cost savings by speeding the preparation process, or by reducing reliance on costly ingredients.

**What are the key factors/trends shaping innovation in 2023?**

Over the past few years, the biggest factor shaping both innovation and demand of flavors was obviously the COVID-19 pandemic, which disrupted consumer food and beverage habits on every possible level. However, as we transitioned out of the pandemic last year, the focus quickly shifted to economic concerns as consumers faced myriad new challenges such as supply shortages, increased U.S. dollar inflation and decreased consumer spending. All of these factors are playing a major role in shaping the food and beverage market, as the economy continues to impact consumer purchasing decisions and the industry rises to meet consumer demand.

In light of new economic challenges, the underlying theme over the past year for the food and beverage industry is redefining value. Consumers are more price-conscious than in recent years, which puts more responsibility on brands to deliver value in terms of functionality, experience, convenience, quality and especially flavor. According to Mintel[f] research, 57% of U.S. consumers claim that inflation will lead them to cut back on dining out, indicating a major shift that will put added focus on CPG product development while also pressuring foodservice to deliver robust flavor experiences that keep consumers coming back, despite inflationary concerns.

One of the aspects that delivers the most value to consumers is the promise of health benefits through functional ingredient claims. According to Mintel[g] research, 42% of U.S. adults like their food and drink to contribute to both their mental and physical health. This is driving product innovation across all categories to utilize functional ingredients that deliver a range of tangible health and wellness benefits such as boosting immunity support, improving mental health, optimizing focus, concentration and calming, enhancing hydration and sustaining energy. Vitamin-rich and zero sugar recipes are a major source of innovation over the past year, along with demand for convenience in the form of sports and energy formats that can be prepared and customized at home. Recent advancements in the quality, availability and efficacy of powders and tablets are proving to be major competition for RTD formats. As brands explore exotic new ingredients to meet the demand for functionality, the role of the flavor industry is growing to optimize the taste of foods and beverages through flavor modulation, masking, mouthfeel and more.

The focus on healthy foods isn't limited to functionality, either. Over the last few years, consumer demand has been growing for clean label foods and beverages made from simple, whole ingredients that are easy to understand. Governmental legislature is increasingly banning artificial colors, preservatives and other processing aids, leading many brands to rely on the flavor industry to bridge the gap with innovative solutions for producing foods and beverages that still taste great. Consumers are acutely aware of the health impact of certain foods and ingredients and information is traveling faster than ever before, through social media and influencers instead of traditional advertising. This is compressing the cycle time for product development and increasing the industry's reliance on flavor modulation technology.

[f] *https://www.mintel.com/press-centre/mintel-announces-global-food-and-drink-trends-for-2023/#:~:text=Consumers%20will%20look%20for%20food,and%20caffeine%20(in%20moderation).*

[g] *https://store.mintel.com/report/a-year-of-innovation-in-functional-food-drink-2022*



Another way that brands are emphasizing value is through premiumization of ingredients and flavor profiles. This is especially evident in the alcoholic beverage category, where bold, exotic flavors can imbue a sense of excitement and overcome any barriers to purchase, including price concerns. According to Mintel[h] research, 63% of U.S. drinkers agree that craft spirits are worth paying a premium, and half of all U.S. adults say that taste is the reason they drink alcohol. Often, this means brands expanding to more exotic natural flavor ingredients such as fruit flavors like dragonfruit, pomegranate, lychee, passionfruit, blackcurrant, acai and prickly pear, or tapping into botanicals such as elderflower, lemongrass, hibiscus and ginseng. Beverage brands are even tapping into savory flavors like pecan, rhubarb, cardamom and winter spices to add a layer of sophistication to an alcoholic beverage formulation. In many cases, the same flavor experimentation in the alcoholic category is growing in non-alcoholic beverage development as well. This focus on flavor reflects the growing trend of U.S. consumers who have decreased alcohol consumption since the pandemic, as part of a shift toward healthier lifestyles, especially among younger consumers. Regardless of the ABV, nearly 40% of U.S. consumers choose beverages as a way to treat themselves, and the pathway for trial is flavor.

Across all categories, foods and beverages need to deliver an elevated experience, and that's where flavor is the pathway to providing value to consumers. Foodservice is a great example, since restaurant dining is often one of the first sectors impacted by economic downturn. Inflation is forcing consumers back into the kitchen, following years of at-home cooking necessitated by the pandemic. While the industry is quick to adapt with unique flavors and products that ease the kitchen burden, it's never been more important for restaurants to stand out with distinct flavors and culinary experiences that aren't easily replicated at home. Restaurant menus are often where consumers are introduced to certain flavors for the first time, and foodservice plays a vital role in the development of all food and beverage products. This is especially true of international flavors, which are often introduced to consumers through fusion foods that blend U.S. cuisines with global fare for exotic-yet-familiar flavors that can be the catalyst for major trends in the future. In particular, Korean and African are among the hottest emerging international cuisines, with flavors like gochujang, doenjang, kimchi, za'atar and cumin and irú becoming increasingly mainstream as they feature more prominently in product launches. Other regional or international cuisine such as Italian, Japanese, Greek and Pacific are experiencing directional growth in new product launches because these foods often balance plant- and animal-based products as part of a 'flexitarian' approach to healthier eating, another major trend in recent years.

> "New technologies are the foundation of what we do at T. Hasegawa, and we remain committed to innovation [..] and customizing new technologies."

**Can you share your insights on the impacts of evolving regulatory updates?**

The most significant regulatory update in several years happened on January 1 of this year when the U.S. FDA classified sesame as the ninth major food allergen. This change meant that food manufacturers must ensure that their products are free from any undeclared allergens, which can occur due to cross-contamination during processing. Sesame joins milk, eggs, fish, shellfish, tree nuts, peanuts, wheat and soybeans as major food allergens–a change that is disrupting the industry and requiring extensive updates to manufacturing processes, ingredient suppliers, labelling and more. As a flavor manufacturer, this change meant that we are required to declare sesame along with all other allergens in ingredients to our customers.

In anticipation of the FDA's regulatory change, T. Hasegawa took a proactive approach and had been declaring sesame along with other potential allergens long before the update this year. We have also developed several roasted sesame oil replacement flavors that offer an alternative to sesame, which is working well with our customers. We strive to stay ahead of regulatory updates and go beyond simply complying with these policy changes, to offer innovative solutions to our customers.

[h] *https://store.mintel.com/report/the-future-of-wine-and-spirits-market-report-2022*

Hosted by perfumer & flavorist

WPC

2024 WORLD PERFUMERY CONGRESS

The Sensory Event for Fragrance Leaders

*World Perfumery Congress*

June 25-27, 2024

Palexpo | Geneva, Switzerland

# Save the Date!

*Resign and Receive This Year's Rates*



# *Flavorcon* 2023 Serves Up Sessions on Flavor Development

Innovative sessions on flavor development are on the menu at this year's event.



*Immerse yourself in a world of flavors, aromas, and innovations on the expo hall floor while you engage with industry leaders, sample the latest in ingredients and flavors and stay ahead of market trends.*

Have you registered yet for *Flavorcon* 2023? Be sure to reserve your seat ASAP to receive the best rates for the two-day conference (November 8-9) and expo hall event by visiting *www.flavorcon.com*. There's also still time to register for the **Flavorist Master Class** hosted by "Flavor Bites" columnist John Wright and "Flavor Reports" columnist Cyndie Lipka. New to *Flavorcon*, this first-come first-served pre-*Flavorcon* session is designed to take attendees on a guided tour through a lineup of organoleptic materials on November 7, 2023.

## Flavor Development Tools

How can we improve upon flavor creation? Scientist and inventor Steve Leusner teams up with Intellex CEO Jason McCaw for their session, "**The Current State of Flavor Creation and How We Can Improve It**," to discuss the creation process from development to testing. Audience members come away with an understanding of:

- The origins of flavor chemistry
- Review of the current trial & error flavor development process

Reproduction in English or any other language of all or part of this article is strictly prohibited. © 2023 Allured Business Media.

- Replacing trial and error flavor development with directed processes
- The basic tenets of creating a flavor with definable liking scores, costs and lowest number of chemicals
- Increasing speed to market, flavor hit rate and profitability



*Steve Leusner*

## Time to Harmonize

McCormick principal flavorist Sam Tharpe will take the stage for his session, "**The Harmony of Taste from the 18th Century Perspective**," to discuss the importance of harmony in flavor formulation with multi-sensorial samplings.



*Jason McCaw*

Join Tharpe on this journey back in time to the 18th century as he explores the harmonization of music, taste and flavors.

Based in Hunt Valley, Maryland, Tharpe develops harmonized flavors for the beverage industry. He currently serves on the Board of Directors of the Science History Institute located in Philadelphia, Pennsylvania representing the Society of Flavor Chemists.



*Sam Tharpe*

## Sample the Latest

Imagine the possibilities while exploring the *Flavorcon* expo! Immerse yourself in a world of flavors, aromas, and innovations while you engage with industry leaders, sample the latest in ingredients and flavors and stay ahead of market trends. Join us to identify new suppliers, partners and service providers at *Flavorcon* for a flavorful experience like no other!

## Planning Ahead

Once you secure your ticket to *Flavorcon* 2023, be sure to also mark your calendar for the Women in Flavor and Fragrance Commerce (WFFC) Tokyo Kitty event scheduled for the evening of November 7 as a pre-*Flavorcon* networking event. Registration information for the event can be found at *www.wffc.org*.

p&f+




# Ad Index

| Advertiser | Web site | Page |
|---|---|---|
| Agrumaria Reggina | *www.agrumariareggina.it* | 11 |
| Aurochemicals | *www.aurochemicals.com* | 5 |
| Berjé, Inc. | *www.berjeinc.com* | C2 |
| Fleurchem, Inc. | *www.fleurchem.com* | 32 |
| Givaudan France SAS | *www.givaudan.com* | 23 |
| Hangzhou Grascent Co. Ltd. | *www.hangzhougrascent.com* | 39 |
| John Wright | *www.johnrwright.com* | 36 |
| Mane | *www.mane.com* | 31 |
| Natural Advantage | *www.natadv.com* | 7 |
| OQEMA | *www.oqema.com/en/* | C3 |
| Payan Bertrand | *www.payanbertrand.com* | 45 |
| Penta Manufacturing Co. | *www.pentamfg.com* | C4 |
| Robertet | *www.robertet.com/en* | 33 |
| Santanol | *www.santanol.com* | 19 |
| Sensient | *www.sensient-tech.com* | 37 |
| Symrise | *www.symrise.com* | 1 |
| Tournaire SA | *www.tournaire.fr* | 25 |
| Vigon International, Inc. | *www.vigon.com* | 3 |





OQEMA
AROMA INGREDIENTS
ESSENTIAL OILS
ABSOLUTES
COOLING AGENTS
GUTEN TAG
IFEAT BERLIN
See you at stand 7 at IFEAT, Berlin from the 8th - 12th October 2023.
NEW YORK · ROTTERDAM · DUBAI · OXFORD · SHANGHAI · HAMBURG · KUALA LUMPUR
www.oqema.com

# Developing Better Products through Natural Chemistry

*Penta Manufacturing Company is Family Owned and Operated for Over 40 Years.*

*Here is a partial listing of our Family of Custom ingredients utilized in flavor & fragrance formulations.*

*For detailed paperwork on all of our items consult our web site at www.pentamfg.com*

- FLAVIS 2.163 2-HEXANOL
- FLAVIS 9.643 METHYL GERANATE
- FLAVIS 13.132 FURFURYL HEXANOATE
- FLAVIS 13.17 L-ROSE OXIDE
- FEMA 2144 BENZYL ETHYL ETHER
- FEMA 2251 CARVEOL PROPIONATE
- FEMA 2298 CINNAMYL CINNAMATE
- FEMA 2366 TRANS-2-DECENAL
- FEMA 2374 DIETHYL MALATE
- FEMA 2431 ETHYL CYCLOHEXANE PROPIONATE
- FEMA 2495 FURFURYLIDENE ACETONE
- FEMA 2535 GUAIACOL PHENYL ACETATE
- FEMA 2706 2-METHYL HEPTANOIC ACID
- FEMA 2865 PHENYLETHYL FUROATE
- FEMA 2888 HYDRATROPIC ALDEHYDE DMA
- FEMA 2952 PROPYLIDENE PHTHALIDE
- FEMA 3006 SANTALOL
- FEMA 3007 SANTALYL ACETATE
- FEMA 3137 2,6-DIMETHOXYPHENOL
- FEMA 3142 CITRONELLIC ACID
- FEMA 3333 3-BUTYLIDENE PHTHALIDE
- FEMA 3426 ACETALDEHYDE DMA
- FEMA 3492 ETHYL UNDECANOATE
- FEMA 3539 OCIMENE NATURAL
- FEMA 3599 TIGLIC ACID
- FEMA 3690 CIS-3-HEXENYL LACTATE NATURAL
- FEMA 3697 2-HYDROXY-4-METHYLBENZALDEHYDE
- FEMA 3723 2-OXOBUTYRIC ACID
- FEMA 3733 P-CRESYL CAPRYLATE
- FEMA 3896 PRENYL MERCAPTAN
- FEMA 3912 9-DECENAL
- FEMA 3983 TRANS-2-HEXENYL CAPROATE
- FEMA 4008 TRANS,TRANS-3,5-OCTADIEN-2-ONE
- FEMA 4100 3,5,6-DIMETHYL-2-ISOBUTYLPYRAZINE
- FEMA 4121 GERANIC ACID

***For a complete list of all our natural, natural identical and synthetic ingredients visit us at www.pentamfg.com***




50 Okner Parkway, Livingston, New Jersey 07039-1604
Phone: (973) 740-2300 ■ Fax: (973) 740-1839
E-Mail: sales@pentamfg.com ■ Web: www.pentamfg.com


USDA FEMA 100 A Century of Great Taste MEMBER FDA U.S. Food and Drug Administration APPROVED K CERTIFIED HALAL

Penta®

Penta Manufacturing Company

*A Division of Penta International Corporation*