March 2024
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What's Next in Fragrance Tech

Explore an opinion piece, "Biotech's Radical Transparency Will Safeguard Fragrance," on page 16.

Current & Evolving Legislation Influencing Fragrance Ingredient Regulations

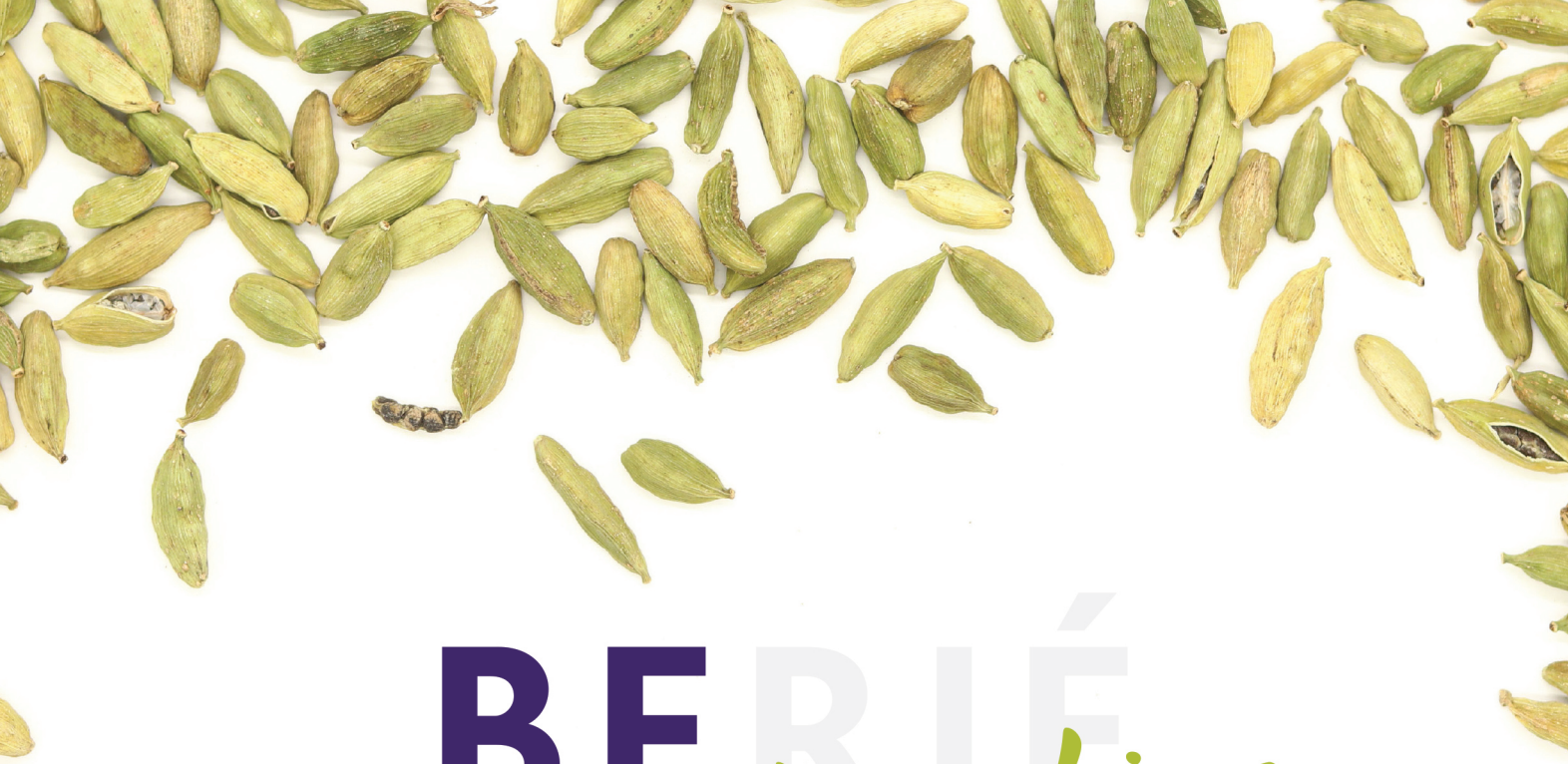
Flavorists Weigh in on How the Ozempic Trend Might Influence Innovation

Industry Insights: Encapsulation Fragrance Delivery Technology

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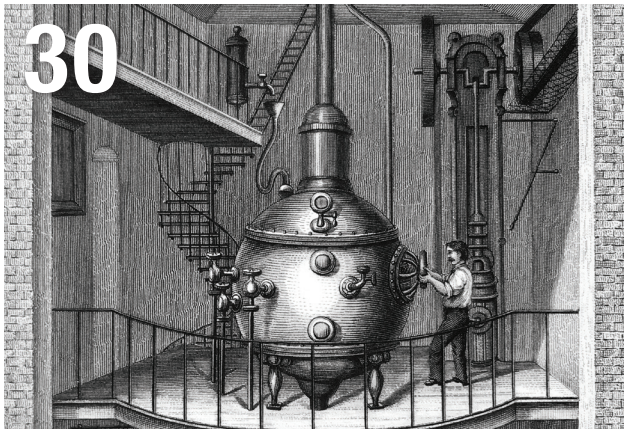
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ON THE COVER: Image courtesy of Google DeepMind at Pixels

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Fragrance Moves Ahead with Biotechnology, Social Media Influence & Delivery Tech



Beyond biotech, readers can also find industry insights on encapsulation technology, as well as social media's influence on innovation in fragrance formulation. Image courtesy of Studio DRasa at Adobe Stock.

Headlines have been flooded with news of recent debuts in fragrance technology. One of which occurred in late January, when Sensegen announced a "creative and technical" partnership with Takasago, said to mark a significant leap forward in fragrance creation powered by biotechnology innovation.

With building buzz on biotechnology, *Perfumer & Flavorist+* (*P&F+*) connected with Debut's Joshua Britton to pen an opinion piece for this issue, "Biotech's Radical Transparency Will Safeguard Fragrance," which can be found on **page 16**. Britton will also be joining the *World Perfumery Congress* 2024 (*WPC*) speaker roster on the Green Technology panel this summer. All speakers and sessions can be found on *www.worldperfumerycongress.com*.

Beyond biotech, readers can also find industry insights on encapsulation technology, as well as social media's influence on innovation in fragrance formulation. See what's trending and how brands can tap into the white space in the market on **page 20**.

With all this talk of the future, we wanted to give an ode to the past by connecting with author Ronald Piech to discuss his novel, *Cradle of an Industry: Scents and Flavors from Central Germany*, which draws a profile of the entrepreneurship of the Fritzsche family from Leipzig, based on initiative, internationality, inclusion of science and research, and social responsibility (**page 30**).

World Perfumery Congress 2024

Speaking of the future of fragrance, the *WPC* 2024 is fast approaching! Set for June 24-27 in Geneva, Switzerland, at Palexpo. Early bird registration ends on March 13, so be sure to get your ticket for maximum savings. Members of the American Society of Perfumers (ASP), Women in Flavor and Fragrance, British Society of Perfumers and ISPC receive a special discount, be sure to reach out to your association. We connected with ASP board member Delphine Perdon Rupnow to discuss how attendees can get the most out of their experience (**page 46**). Readers can also find the growing list of exhibitors set to highlight the fresh ingredients, technologies and services the fragrance industry has to offer.



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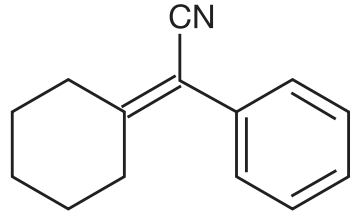


Spearmint Oil Indian

Hindustan Mint & Agro Products Pvt. Ltd

www.hindustanmint.com/essential-oils/spearmint-oil-l-carvone

This natural Indian origin spearmint oil (FEMA# 3032, CAS # 8008-79-5, EC # 283-656-2) is obtained by steam distillation of flowering tops of the spearmint (*Mentha spicata*) plant. Its primary constituent is L-carvone which gives spearmint its distinctive odor.

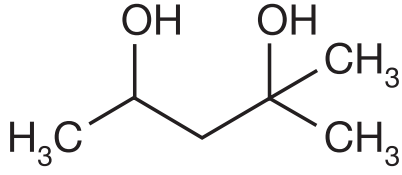


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2-Cyclohexylidene-2-phenyl-acetonitrile, peony acetonitrile, alpha-cyclohexylidene benzeneacetonitrile, Peonile (Givaudan) (CAS# 10461-98-0). Features tastes and odors of floral, geranium, grapefruit and fresh. For use in fine fragrance, beauty care and soap. Recommended use level is between 1% and 10%.



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cis-3 Hexenyl Propionate

Penta International Corp.

www.pentamfg.com

Now offering *cis*-3 hexenyl propionate (FEMA# 3933, CAS# 33467-74-2, JECFA# 1274) both natural and synthetic. Flavor base as green pear, apple, oily and waxy. Used for fruity and tropical flavors. Adds odor notes as sweet, powerful and green. Vegetable-like with tropical hints. Food grade, Kosher and Halal.



2-Isopropyl-5-Methyl-2-Hexenal

Natural Advantage, LLC

www.natadv.com

Natural Advantage introduces natural 2-isopropyl-5-methyl-2-hexenal (FEMA 3406, CAS 35158-25-9). This material occurs naturally in cocoa and has a very woody, chocolate aroma. With a fruity, bitter chocolate taste, it works well in concert with other chocolate ingredients. 2-Isopropyl-5-methyl-2-hexenal can be used in chocolate, cocoa, tea, nut, tobacco and fruity flavors. Use levels are 0.02-2ppm as consumed. 2-Isopropyl-5-methyl-2-hexenal is EU and U.S. Natural, Kosher, vegetarian, non-GMO.



Ethoxyethyl Acetate-1

Symrise AG

www.symrise.com/de/scent-care/aroma-molecules/flavor-ingredients/#Ethoxyethyl-Acetate-1

Flavor ingredient ethoxyethyl acetate-1 (FEMA# 4069, CAS# 1608-72-6) offers refreshing, fruity and slightly peely notes. It contributes perfectly to the sweet juiciness of orange beverages and supports other citrus notes. In this typical application, ethoxyethyl acetate-1 acts as an acetaldehyde precursor. It also enriches alcoholic drinks and adds bright freshness to fermented milk products.



Clean Fragrance Formulation

Delbia Do

https://delbiado.com/

With transparency and clean beauty on everyone's mind, Delbia Do is creating Credo clean and Target clean fragrances for their customers. They are using sugar cane alcohol for many brands too. Contact them for your clean fragrance development needs.



Bois de Rose Oil ex Leaves

Berjé Inc.

www.berjeinc.com/products/essential-oils/bois-de-rose-oil-ex-leaves/

Bois de Rose Oil ex Leaves (FEMA# 2156, CAS# 8015-77-8) is distilled from the leaves and twigs of the Aniba rosaeodora tree, better known as "rosewood." Berjé's bois de rose is produced using natural and sustainable plantation methods, providing an incredibly fragrant and linalool-rich product without comprising the botanical's precious heartwood.



cis-3-Hexenyl Methyl Butyrate

Avant Organics

www.avantorganics.com

cis-3-Hexenyl Methyl Butyrate (FEMA# 3497, CAS# 10094-41-4) is a unique ester that possesses a distinct profile for blending fruity, green and slightly sweet notes. This organic compound can be described as having a green, apple-like flavor, reminiscent of fresh apples and other green fruits. It is great for adding sweet and juicy dimensions to the overall flavor profile, especially juicy pine-apple. Being that it exhibits a strong green scent, like freshly cut grass and green leaves, it brings about outdoorsy aromas that are often associated with spring and summer fragrances contributing to the overall freshness. Avant Organics provides this material as EU Natural, Kosher, non-GMO and Halal. For your free sample please email info@avantorganics.com.

Ennolys Names Jean de Lataillade as Managing Director

Ennolys has named Jean de Lataillade as managing director. Before joining the Ennolys team, de Lataillade was with the Lesaffre Group for ten years, beginning in 2013 in Shanghai to manage the Greater China region. From 2016 to 2023, de Lataillade presided over the Latin America region,

In a recent interview, de Lataillade shared Ennolys' ambitions for the coming years, he stated, "Over the decades, we have acquired a unique know-how in fermentation and Down Stream Processing, built high-performance production workshops, and developed technical skills that are quite distinctive. Our ambition now is to capture the full value of these investments, mainly by developing our contract manufacturing activity and innovating to diversify our product portfolio. As the leading Lesaffre Business Unit (BU) in bacterial fermentation, we will also continue to offer our production services to the other BU's of the group."



Before joining the Ennolys team, Jean de Lataillade was with the Lesaffre Group for ten years, beginning in 2013 in Shanghai to manage the Greater China region.

Global Flavors Market to Grow at 5.7% CAGR from 2023 to 2030

The global flavors market is expected to grow at a CAGR of 5.7% from 2023 to 2030, according to a new report.

The market size is anticipated to reach $28.54 billion by 2030.

Consumers have shifted their preferences in the food industry with reference to the growing acceptance of unique and exotic flavors. As a result there has been an emergence of natural flavor enhancers made from botanical and fruit extracts.

Fusion-based flavor combinations are also gaining popularity in creating innovative food products.

In addition, an increased preference for natural ingredients is encouraging manufacturers to opt for natural flavors without relying on artificial additives or synthetic flavors.



Fusion-based flavor combinations are also gaining popularity in creating innovative food products.

Report highlights:

- The synthetic flavor segment held the largest market share of 67.2% in 2022 owing to technological advancements in the formulation of new flavors.
- The natural flavor segment is anticipated to register the fastest CAGR of 7.3% over the forecast period.
- Liquid/gel form-based flavors segment is anticipated to grow at a CAGR of 5.0% over the forecast period.
- Asia Pacific is estimated to grow with the fastest CAGR of 6.6% over the forecast period.
- In terms of form, the powdered flavors segment held the largest market share of 66.0% in 2022.

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ADM Acquires UK-Based Flavor and Functional Ingredients Producer FDL

On December 19, 2023, ADM announced that it had reached an agreement to acquire UK-based FDL, a developer and producer of premium flavor and functional ingredient systems.

The acquisition is subject to customary closing conditions. ADM intends to complete the transaction by the end of January 2024.

FDL, with projected 2023 sales of approximately $120 million, operates three production facilities and two customer innovation centers, all in the United Kingdom. The company's approximately 235 colleagues, which include about 40 dedicated innovation specialists, have created more than 10,000 proprietary flavor formulations.



Eric Beatty, CEO of FDL, said, "We are excited to enter into this agreement with ADM. They're an ideal partner for us, with global nutrition and flavor capabilities that will provide new opportunities to strengthen FDL's portfolio of taste and nutrition solutions."

"Our ongoing investments to add to our flavors portfolio are helping power our strategic work to build a global leader in Nutrition," said Calvin McEvoy, ADM's president of global flavors. "FDL's innovative and agile formulation knowledge, deep end-use applications expertise, and strong customer base make them a great addition to ADM's global flavor capabilities. We are incredibly impressed by the FDL team, and we believe both companies will benefit from each other as we work to expand our reach in key channels, particularly foodservice."

Eric Beatty, CEO of FDL, said, "We are excited to enter into this agreement with ADM. They're an ideal partner for us, with global nutrition and flavor capabilities that will provide new opportunities to strengthen FDL's portfolio of taste and nutrition solutions. In turn, the FDL team looks forward to helping add to ADM's broad offerings with our diverse portfolio of flavor and functional ingredient systems, IP, and capabilities, as well as the entrepreneurial spirit and innovativeness of human talent that has enabled FDL to become a differentiated market leader today. ADM is synonymous with the best in animal and human nutrition, and together, we look forward to delivering new and innovative ingredient solutions to our global customer base in the food and beverage industry."



Fragrance Creators Expands The Fragrance Conservatory to Nearly 500 Ingredients



The site explores the safety and stewardship of the fragrance industry, the history of fragrance, and the unique well-being benefits scented products provide.

Fragrance Creators Association (Fragrance Creators) announced that its FragranceConservatory.com now includes nearly 500 fragrance ingredient profiles. The site explores the safety and stewardship of the fragrance industry, the history of fragrance, and the unique well-being benefits scented products provide. In addition, the nearly 500 ingredient profiles included in the website's Ingredient Directory feature details on individual fragrance ingredients including their scents, origins, synonyms, safety profiles and more.

"Fragrance Creators supports a person's right to know and understand the information they see. Our members are committed to informing and educating consumers, policymakers, and journalists about the safety, benefits, and beauty that are foundational to the fragrance industry," said Farah K. Ahmed, president and CEO, of Fragrance Creators.

"FragranceConservatory.com does just that and we are proud to continue growing this essential resource for its thousands of users. As we add more and more ingredient profiles, we encourage companies along the entire value chain to link to the site to help the public learn more about individual fragrance ingredients, as well as have easy access to fragrance facts, history, chemistry, and more."

IFRA Collaborates with Nez to Publish We Love Fragrances Book

At the 2023 International Fragrance Association (IFRA) Global Summit in Geneva, the association announced its collaboration with the Nez publication to create the book, We Love Fragrances.

The site reads, "The world of fragrance, in all its infinite variety, is an essential part of our lives. Its many perspectives – cultural, economic, social and emotional, as well as agricultural, industrial and technological – are explored in this book, showing just how much fragrance is an element that links us together. To perpetuate this field, the IFRA plays a role in the safety and sustainability of fragranced products. We Love Fragrances brings together numerous testimonials and gives voice to all players in the value chain, from growers, suppliers of natural and synthetic raw materials, creators and producers to researchers, engineers and chemists. A book to discover and rediscover fragrance in all its different facets and understand its present and future challenges."



We Love Fragrances is designed to be a book to discover and rediscover fragrance in all its different facets and understand its present and future challenges.

L'Occitane Group Acquires Dr. Vranjes Firenze

L'Occitane Group has acquired Italian luxury home fragrance brand Dr. Vranjes Firenze. This marks another step in L'Occitane's strategy to build a geographically balanced portfolio of strong premium beauty and fragrance brands.

The brand has been at the forefront of luxury home scents, with a reach spanning more than 75 countries and a robust network including 28 mono-brand stores and 650 points of sale.

Reinold Geiger, chairman of L'Occitane Group, said, "We are thrilled to continue to grow our global brand portfolio with the addition of Dr. Vranjes Firenze, which is complementary to our existing collection of premium beauty and fragrance brands, each with a strong identity and a genuine desire to make a difference."

Paolo Vranjes, founder and chairman of Dr. Vranjes Firenze, said, "Our brand has undergone meaningful growth while honoring the rich heritage of Dr. Vranjes Firenze. It is with great pride that I hand over the legacy of Dr. Vranjes Firenze to the L'Occitane Group, which is known for its distinguished heritage and expansive global reach."



Dr. Vranjes Firenze has been at the forefront of luxury home scents, with a reach spanning more than 75 countries and a robust network including 28 mono-brand stores and 650 points of sale.

Brazilian Flavor Producer Duas Rodas Acquires tropextrakt GmbH & Innovation Center



Duas Rodas' acquisition of tropextrakt will be essential for Duas Rodas to continue to expand its exports.

Duas Rodas, a Brazilian multinational producer of flavors, botanical extracts and ingredients for the food and beverage industry, has just acquired 100% of tropextrakt GmbH, a company based in Frankfurt, Germany.

tropextrakt GmbH imports and distributes botanical extracts and a wide variety of natural tropical fruit products, such as purees and concentrated juices, to about 1,000 customers. In addition to supplying fundamental items to the manufacture of food and beverages, tropextrakt operates a laboratory for testing the application of ingredients in the final product.

With the acquisition by Duas Rodas, this laboratory will be transformed into an innovation and technology center, which is designed to expand the research and development of products aimed at the supplements and functional food industry.

The acquisition of tropextrakt is said to be essential for Duas Rodas to continue to expand its exports. The international market represents, on average, 18% of the company's total revenues and should reach 25% in the next four years without new acquisitions, or 45%, with new purchases.

"We are a company based on excellence and constant innovation", says Leonardo Fausto Zipf, president of Duas Rodas. "With the acquisition of tropextrakt, we will create a business, research and innovation center for the European market."

"The European market for botanical extracts and other ingredients for the production of nutraceuticals is one of the most sophisticated in the world", says Rosemeri Francener, international business director at Duas Rodas. "From now on, we'll be closer to local customers to develop increasingly innovative, healthy and sustainable products in partnership."

IFF Appoints J. Erik Fyrwald as CEO and Board Director

On January 11, 2024, IFF announced the appointment of J. Erik Fyrwald to succeed Frank Clyburn as chief executive officer (CEO) and member of the IFF Board of Directors, effective Feb. 6, 2024. The company shared that Clyburn will work closely with Fyrwald throughout the transition, remaining with IFF until March 31, 2024, and further serving in an advisory capacity through December 2024.

Fyrwald brings to IFF more than four decades of executive and operational experience driving innovation and profitable, sustainable growth at leading corporations in the nutrition, agriculture and chemicals industries. He most recently served as CEO of Syngenta, where he spearheaded the strategy that is said to have doubled the business and delivered exceptional shareholder value during his tenure. Before Syngenta, he served as CEO of Univar Solutions and Nalco, in addition to holding numerous global and regional executive leadership roles with DuPont, including in the company's Agriculture and Nutrition business.

"We are delighted to welcome Erik to IFF's Board and leadership team," said board chair Roger W. Ferguson, Jr. "Erik's exceptional track record, passion for successful execution, customer-centric mindset and highly complementary industry experience will be invaluable as we capitalize on the significant value creation opportunities ahead of us. The Board is confident that Erik is the right executive to shepherd IFF through its next chapter as we execute on our strategic plan with a focus on driving long-term, profitable growth."

Ferguson continued, "On behalf of the Board, I want to thank Frank for his leadership and contributions to IFF. During his tenure, Frank played an instrumental role in strengthening our commercial execution and Research & Development initiatives, executing our portfolio optimization efforts and guiding IFF through the initial stages of our refreshed strategic plan. We wish him all the best as he leaves IFF to pursue outside interests."

"I am thrilled to be joining the IFF team," said Fyrwald. "I have been an admirer of IFF for many years, including when I was leading DuPont's Agriculture and Nutrition business, and I'm excited to help advance its purpose of applying science and creativity for a better world. With its strong foundation, leading position across attractive categories and expansive global network, IFF remains at the forefront of bringing leading sustainable ingredient solutions to customers and communities globally. With strong progress made against IFF's strategic priorities, I look forward to doubling down on execution to accelerate financial performance by building on the company's innovation, commercial and productivity efforts, and continuing to strengthen its capital structure through portfolio optimization to drive value creation for all IFF stakeholders."



J. Erik Fyrwald is said to bring more than four decades of executive and operational experience driving innovation and profitable, sustainable growth at leading corporations in the nutrition, agriculture and chemicals industries.

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Givaudan Adds Scentaurus Vanilla to Fragrance Precursor Collection



Scentaurus Vanilla is a non-coloring, elegant vanilla note, specifically designed for liquid detergents.

Givaudan has debuted Scentaurus[a] Vanilla as the extension of its fragrance precursor collection. Scentaurus Vanilla is a non-coloring, elegant vanilla note, specifically designed for liquid detergents. Naturally activated by oxygen, this high-performing new precursor delivers a wave of freshness and a long-lasting powdery, creamy vanilla effect.

Scentaurus Vanilla is said to increase creative possibilities and differentiation in the market with unique precursor combinations. These precursors maximize a fragrance's long-lastingness across many applications, allowing for the exploration of new olfactive territories and delayed impact.

[a]Scentaurus is a trademark of Givaudan

Givaudans internal research discovered that 69% of consumers express their desire for fragrances to be long-lived because it "makes them feel fresh all day," Givaudan's range of fragrance precursors creates memorable moments and evokes positive emotions, offering consumers an experience of everlasting freshness.

Scentaurus Vanilla is a biodegradable molecule according to OECD guidelines and was developed according to the Principles of Green Chemistry, using Givaudan's proprietary FiveCarbon Path and a Safe-by-Design approach.

Givaudan perfumer Nadia Geyken said, "Scentaurus Vanilla reminds me of the sweet and wholesome smell of cocoa and vanilla! It is nostalgia's gentle dance! In a detergent fragrance, it brings softness and powdery facets without coloration - what a revolution!"

Pura Debuts Open Air Technology Designed to Combat Household Odors with Fragrance

Smart fragrance company Pura has debuted eight new fragrances with Open Air Technology[a], a technology specially designed to reduce unwanted odors in user's homes and replace them with fragrance.

Open Air Technology is said to actively neutralize and remove bad odors at a molecular level. This line is said to be developed with patented odor control technology formulated for specific areas in the home, like kitchens, bathrooms, and pet areas to create a "fresh and invigorating atmosphere in your home."

Pura recommends a 30-minute activation period for these products. Open Air Technology fragrances include:

- Chamomile Mint (Most effective at removing bathroom odors): A blend of gentle chamomile with cooling mint as bergamot and musk.
- Citrus Leaves (Most effective at removing kitchen odors): Combines notes of green leaves and ozonic marine with lily, jasmine, and cozy musk.
- Clementine Mango: (Most effective at removing bathroom odors): Blends juicy clementine with tropical mango, pineapple, and soft vanilla.
- Cucumber & Peach: (Most effective at removing kitchen odors): Combines citrus, cucumber, and sweet peach with an herbal blend of basil and lavender.
- Fresh Bergamot (Most effective at removing bathroom odors): Combines bright citrus with a blend of fragrant florals and amberwood.
- Juicy Acai (Most effective at removing pet odors): Combines crisp apple, plump acai berry, and juicy red fruits with a blend of dewy florals and orchard woods.
- Pink Pomelo (Most effective at removing kitchen odors): Blends juicy citrus with strawberry, crisp apple, tart rhubarb, and refreshing verbena.
- Water Lily (Most effective at removing pet odors): A blend of sparkling bergamot, water lily, and dewy greens blended with soft musk.

"Since our customers wanted a way to get rid of bad odors, we developed Open Air Technology because we believe everyone deserves to breathe in clean and fresh air," said Trevor Davis, Pura's senior director of Research and Development. "As much as people love smelling nice things, they hate smelling bad things even more. Originally an evolutionary tool, this bias influences how we perceive our environments, including the scents around us. Our technology is designed to counter this, enhancing positive sensory experiences in everyday life. We are proud to offer an innovative solution to help shift the balance, making everyday life smell better and feel more positive."

p&f+



This line is said to be developed with patented odor control technology formulated for specific areas in the home, like kitchens, bathrooms, and pet areas.



Juicy Acai is said to be most effective at removing pet odors and combines crisp apple, plump acai berry, and juicy red fruits with a blend of dewy florals and orchard woods.

[a]Open Air Technology is a trademark of Pura

IFF, Unilever and Wageningen University Partner to Address Plant-based Flavor Challenges



The project's primary focus is said to lies in exploring the ways flavors bind to protein molecules intending to recommend novel flavoring strategies that elevate the sensory experience of plant-based meat alternatives.

IFF has announced a collaborative four-year research initiative with Unilever and Wageningen University & Research (WUR) in protein-flavor interactions to address flavor challenges in plant-based meat alternatives.

The catalyst for this collaboration is the longstanding challenge of working with plant proteins which are known to create many off-notes and lingering bitterness in plant-based meat alternatives.

The project's primary focus is said to lies in exploring the ways flavors bind to protein molecules intending to recommend novel flavoring strategies that elevate the sensory experience of plant-based meat alternatives.

IFF is said to contribute years of extensive research in protein purification and natural food flavoring, WUR will study the protein flavor interactions, while Unilever's involvement ensures that the research remains guided by consumer preferences.

"Our mission is to understand and improve flavor quality in plant-based meat alternatives by unraveling the intricacies of protein interactions, to investigate flavor loss and elevate the overall flavor profile," said Neil Da Costa, lead scientist, global product research, IFF. "This joint commitment aligns with our shared goal of improving consumer eating experiences and fostering positive change within the plant-based food industry.

"Moving to a more plant-based diet is very important for our health and for the planet," said Manfred Aben, nutrition and ice cream head of science and technology at Unilever. "Technology is a key enabler for us to create plant-based products that have the same great taste and texture as animal meat but have a lower environmental



The catalyst for this collaboration is the longstanding challenge of working with plant proteins which are known to create many off-notes and lingering bitterness in plant-based meat alternatives.

footprint We always strive to improve our products and satisfy our consumers' changing needs and preferences. This research partnership will enable us to understand and control how flavors work to create superior plant-based meat products."

"Working together with companies helps translate the knowledge of Wageningen University & Research into practice and for companies to contribute their valuable practical experience for us to learn from," said Hans-Gerd Janssen, part-time professor at the chair group Organic Chemistry of Wageningen University and scientist at Unilever. "Developing meat alternatives that are even tastier and healthier can drive the transition to more plant-based options."



PROFILE: ISOLDE TOMANN

Take a look at Tomann's first scent memory, primary application interests and more in this one-on-one.

Esarom Tomann, Senior Flavorist Isolde Tomann Shares Industry Journey & Project Wins

What led you to the flavor industry?

Isolde Tomann [IT]: During my studies in Food and Biotechnology at the University of Natural Resources and Life Sciences in Vienna, I did an internship at Esarom in Lower Austria. I became a trainee at the Department of Quality Assurance where I not only had to measure the physical parameters of flavors and compounds but also to taste them–a task that I found very interesting. However, at the beginning, it was not easy for me to describe particular differences in tastes and flavors.

In addition to that, I got to know a very mysterious person working in a lab right next door. He was responsible for the flavor creation but never spoke a word with anybody! He just disappeared in his lab and wrote down his secret formulations. I was fascinated!

After finishing my studies it became clear to me that I was going to focus on food technology. By chance, I found a position in a flavor company in Santiago, Chile. Even though South America's flavour industry is booming–my roots are and always will be in Austria. I'm therefore proud of being head of the Flavor Creation team since 2011 at Esarom.



Name: Isolde Tomann

Title: Dipl. Ing./ Senior Flavorist/ Head of the Flavor Creation at Esarom

Location: Korneuburg, Austria

What is your first scent memory?

IT: My first scent memory is related to the "Au," a wild **forest** at the river banks of the Danube. I still fancy that musty, damp smell, that is accompanied by a strong smell of garlic in spring when wood garlic is blooming.

What applications do you primarily formulate for? Do you have a favorite?

IT: The main focus area of my new flavor creations is the soft drink industry. But energy drinks are actually my favorites and I enjoy dedicating myself to creating new and innovative taste experiences in my flavor lab.

Looking back to 1994 I already formulated special editions for this category then—that was long before the current trend of limited editions in the energy drink sector started.

Are there any recent projects/wins you're particularly proud of?

IT: I remember a special limited edition of an energy drink which was an intense project—which I found some time ago in a shop at a petrol station in Manaus–in the middle of the Amazon rainforest.

Describe yourself in three ingredients.

IT: First is turpentine oil–the smell in my studio when I dedicate myself to painting with oil colors.

The second is d-and l-carvonetanding, which stands for the two important attributes of a flavorist–creativity and the ability to make marketable formulations. Finally, galbanum oil; this essential oil comes close to my first smell memories.

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Butterscotch can make good use of furaneol, with usage levels ranging from 1,000 ppm to 3,000 ppm. Image courtesy of therealnodeshaper at Adobe Stock.



BY JOHN WRIGHT
johnwrightflavorist@gmail.com

FLAVOR BITES: FURANEOL PART II

Furaneol in brown, nut and other flavors.

The second half of my article covers all the non-fruit applications of furaneol. Stability can be an issue with furaneol in some fruit flavors, but this is generally not a significant issue in any other flavor category.

Note that the dose rates given throughout this article are the levels suggested for use in flavors intended to be dosed at 0.05% in ready-to-drink beverages or in a simple bouillon. The first half (covering furaneol in fruit flavors) can be found in *Perfumer & Flavorist+*'s February 2024 issue.

Brown Flavors

Butterscotch, Caramel and Toffee: All three related profiles can make good use of furaneol. Levels range from 1,000 ppm to 3,000 ppm.

Chocolate and Cocoa: At first sight, it might seem reasonable to use higher levels of Furaneol in chocolate flavors, but this is not the case. The ideal level

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in chocolate flavors is around 1,000 ppm, but the equivalent level in cocoa flavors is nearly double that.

Coffee: Similar levels of this raw material are effective in coffee flavors, adding depth and taste characteristics.

Licorice: The ideal level in licorice flavors is much lower and reflects more of an aroma effect than any level of inferred sweetness. One hundred ppm works well.

Malt: Six hundred ppm is a good starting point in malt flavors, a little higher for malted milk flavors.

Maple Syrup: Most maple syrup flavors are comfortable with a furaneol addition in the region of 1,000 ppm. This level may be lower if a more authentic profile is the objective.

Molasses and Brown Sugar: Both categories of flavors use similar levels of this raw material, typically around 1,000 ppm.

Tea: Furaneol should be used with caution in green tea flavors, but it is very helpful in black and red tea flavors at levels in the region of 500 ppm.

Vanilla, Bean: Furaneol is very effective in realistic vanilla bean flavors, adding depth and authenticity.



A more moderate addition, around 200 ppm, works perfectly in pistachio flavors. Image courtesy of Altair at Adobe Stock.

Nut Flavors

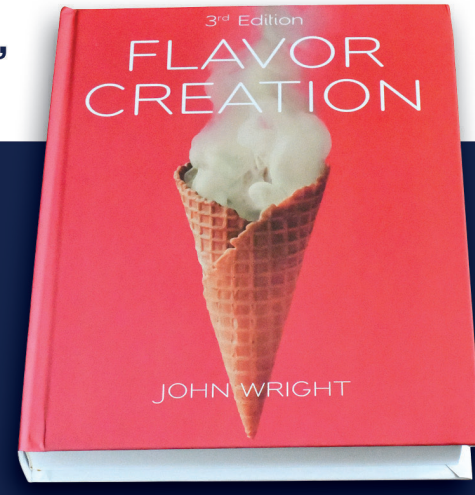
Almond: The ideal level of Furaneol in almond flavors depends on the degree of toast. One hundred ppm is a good starting point.

Hazelnut and Praline: Four hundred ppm works well in both hazelnut and praline flavors, adding depth and realism.

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Lightly baked bread flavors start out using around 200 ppm of this raw material. Image courtesy of Andrii at Adobe Stock.

Peanut: This ingredient is most effective, within the realm of nut flavors, in peanut flavors. One thousand ppm is a good start.

Pistachio: A more moderate addition, around 200 ppm, works perfectly in pistachio flavors.

Walnut: The same 200 ppm level is also very effective in walnut flavors, counterbalancing their inherent lightness.

Other Flavors

Beer: Furaneol is very helpful in beer flavors. The level varies quite dramatically, ranging from 100 ppm in light beer flavors up to 500 ppm in more tasty hoppy flavors.

Brandy: Furaneol is useful in spirit flavors, but only at relatively low levels. One hundred ppm is ideal in brandy and Cognac flavors.

Bread: Lightly baked bread flavors start out using around 200 ppm of this raw material. Higher levels are better in more toasted profiles, such as pizza crust.

Butter: Fresh butter flavors only need a touch of furaneol in the background, as little as 20 ppm. Cooked butter flavors are a different matter and benefit from levels as high as five hundred ppm.

Coconut: All types of coconut flavor need furaneol. The levels of addition are generally in the range of 100 ppm to 200 ppm.

Cream and Milk: Fresh cream and milk flavors are similar, in respect of furaneol, to fresh butter flavors, and only need a similarly low level.

Dough: Furaneol forms an important part of dough flavors. Levels vary but start at around 500 ppm.

Honey: Honey flavors often combine light, floral notes with a sweet background. Furaneol is very effective at rounding out the background. Levels are around 500 ppm.

Milk, Condensed: Five hundred ppm is also a decent level in condensed milk and dulce de leche flavors, adding luscious background sweetness.

Rhubarb: Methyl phenyl carbonyl acetate is at the heart of most rhubarb flavors. It pairs very nicely with furaneol at around 200 ppm.

Rum: Furaneol is not an essential ingredient in rum flavors, but 20 ppm does help to balance the bright esters somewhat.

Whiskey: This ingredient is more important in whisky flavors. A modest addition, around 50 ppm, softens the background notes.

Wine: The ideal level in wine flavors depends to some extent on the type of wine that is the target, but generally falls within the range from 100 ppm to 200 ppm.

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AVANT ORGANICS

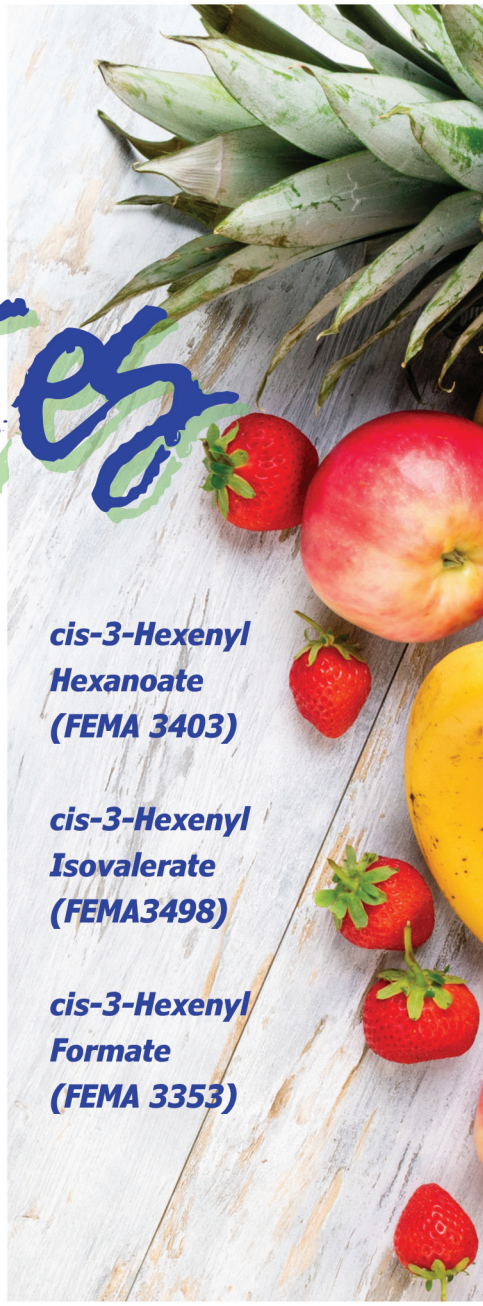
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BIOTECH'S RADICAL TRANSPARENCY WILL SAFEGUARD FRAGRANCE

Biotechnology can shine radiant sunlight into the fragrance industry and address, with exquisite precision, the many urgent challenges it faces.

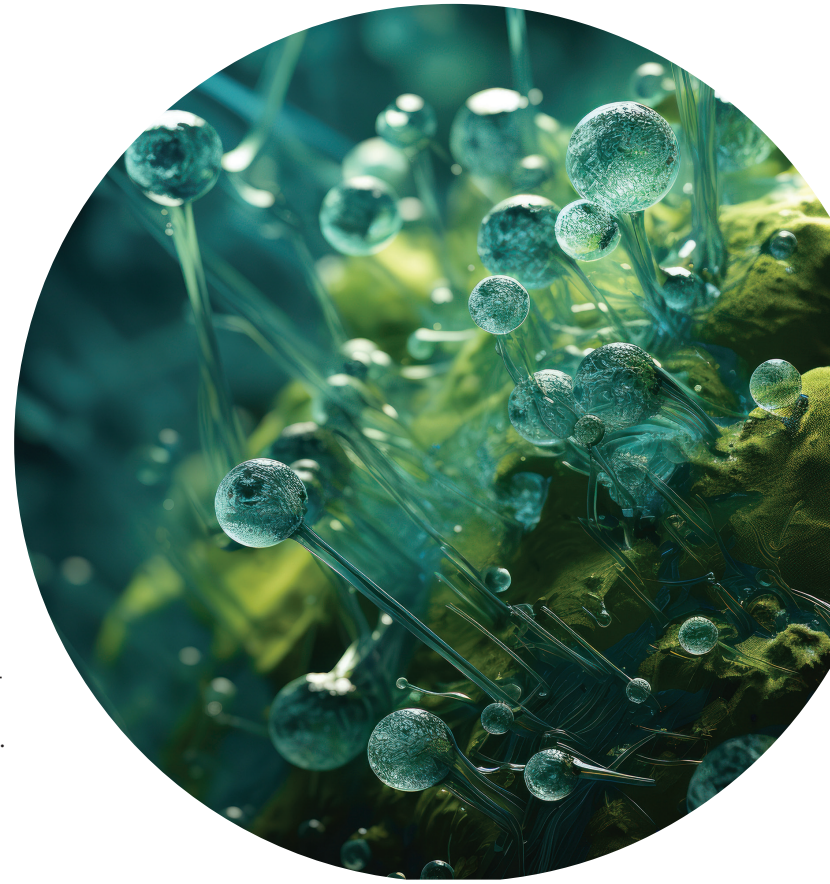
BY JOSHUA BRITTON, PH.D., founder and CEO of Debut.



By creating bio-identical ingredients, biotechnology will enable the fragrance industry to transition to near 100% bio-based formulas, a target that beauty leaders, forward thinkers and innovators are already implementing.

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The fragrance industry, that last bastion of secrecy in beauty, has long subscribed to the adage that one must not let daylight in upon the magic. Fragrance, after all, sells emotions, memories, and desires, and too much explanation could break the spell.



>>This is an opinion piece by Joshua Britton, Ph.D., founder and CEO of Debut<<

All that made sense in the perfumery of yore, when agriculture-intensive harvesting details were proof of committed craftsmanship: 250,000 petals needed to create five milliliters of rose oil, fifteen years before sandalwood trees reached maturity, at which point essential oil production could begin. But that was before climate change, compromised biodiversity and diminishing natural resources, and terms such as "environmental footprint" and "carbon-neutral" entered the daily lexicon. And it was also before transparency swept through every category in beauty–that is, except fragrance.

Now, changes are brewing in European regulations that threaten to limit access to many of the fragrance industry's adored raw materials, especially naturals. Fragrance proposals, that include safeguard clauses for

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As with any breakthrough technology, clear and accessible education is needed around the advent of biotech fragrance ingredients.

naturals, fall under the European Green Deal whose aim is to make Europe the first climate-neutral continent by 2050. Any changes could potentially impact 80% of fragrances on the market including the greats, according to estimates, and have ripple effects worldwide.

What's an understandably alarmed industry to do?

Biotechnology will shine radiant sunlight into the fragrance industry and address, with exquisite precision, the many urgent challenges it faces. With advanced technology and a mastery of biology (not



just chemistry), biotech is equipped to protect the perfumer's palette and catapult the art of perfumery to new levels of alchemy. And it all begins and ends with biotech's radical transparency.

Consumers are driving this momentum for increased transparency. They are scrutinizing ingredient labels and seeking brands that invest in sustainable and ethical ingredient sourcing. Meanwhile, their love affair with naturals, including essential oils, plant extracts and absolutes, continues unabated. Demand for naturals is rapidly outpacing supply. So, what gives?

Only biotechnology is equipped to reconcile these two diametrically opposing needs: the innate consumer drive for naturalness and the unsustainable pressure on the planet's dwindling natural resources.

Biotech is the only solution to halting the extraction of natural ingredients, especially those that are scarce and difficult to source, or are structurally complex and cannot be reconstituted renewably in the lab. It also enables the industry to move away from its dependence on fossil fuel-based synthetics. Biotechnology creates bio-based molecules that mirror the olfactive signature of naturals, thereby reducing the environmental footprint of the industry, including land use and water use. Moreover, advanced biomanufacturing processes incorporate all the hallmarks of transparency: safety, purity, consistency, and supply chain reliability are hardwired in every manufacturing step.

By creating bio-identical ingredients, biotechnology will enable the fragrance industry to transition to near 100% bio-based formulas, a target that beauty leaders, forward thinkers and innovators are already implementing. Bio-identical ingredients are genetic facsimiles of molecules that exist in nature. During the biomanufacturing process, the input is natural, the vehicle that makes the molecule is natural, and the end product–the ingredients–is also natural. Zero compromises are needed by eco-conscious consumers: naturalness, purity, safety, responsible sourcing, and petrochemical-free in a fragrance bottle, combined with the multifaceted, full-bodied quality of naturals.

As with any breakthrough technology, clear and accessible education is needed around the advent of biotech fragrance ingredients. But the world is now more than ready for the intuitive sense of the Venn diagram that features biotechnology in the center of two overlapping circles, with nature on the left and technology on the right.

Biotechnology, in tandem with artificial intelligence (AI), is also the gateway to radical beauty when it comes to creating completely novel ingredients, the likes of which have never been smelled before. Imagine genomic-enhanced fragrances that are scientifically proven to activate your body's sensors, so you are biologically designed to fall in love with it. Or analyzing a person's DNA and then creating a hyper-personalized fragrance that makes one feel truly seen and known. Biotechnology is the game-changer that is reimagining fragrance's future with proprietary fragrance molecules that create a huge intellectual property moat.

Biotech-engineered ingredients will unlock new fragrance possibilities to touch the souls of consumers. Perfumery will never be the same again, and for all the most desired and welcome reasons.

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How Companies are Capitalizing on Fragrance Delivery Technology

Discover the untapped white space and recent innovations in encapsulation technology.



Once sprayed Lupearls is designed to slowly release its scent with time. Image courtesy of Luzi.

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Perfume house Luzi partnered with Microcaps to develop the encapsulated fragrance technology Lupearls[a]. The luxury water-based fragrance tech is said to not contain ethanol, or any other solvents or surfactants.

Lupearls is designed to be a sensorial experience releasing its scent slowly over time, leaving a smooth and gentle feeling on the skin. The fragrance technology is biodegradable, vegan and halal-compliant. *Perfumer & Flavorist+* connected with the Lupearls team and the head of Business Development at Microcaps AG, Fabian Dubler, to better understand the technology.

Can you describe the concept of encapsulation technology as a fragrance delivery system?

Luzi Team [LT]: Regarding Lupearls, we can claim that this technology was developed to create a homogeneous mixture of fragrance oil in water.

The product should not precipitate and should not contain any solvents such as ethanol, solubilizers or surfactants. The haptic after spraying the Fine Fragrance on the skin should not be sticky, but refreshing, cool and comforting.

Furthermore, a high fragrance concentration was desired in order to achieve a strong and long-lasting performance. The capsules also needed to be natural, readily biodegradable and as sustainable as possible.

For Lupearls parfum d'eau the technology used is core-shell encapsulation based on a well-known from the food industry, alginate compound.

The release of the fragrance is triggered mechanically while spray the slurry out of the flacon. Since the nozzle of the sprayhead is smaller than the capsule size, it is broken by force immediately and release the fragrance within the mixture.

Fabian Dubler [FD]: We developed a water-based, ethanol-free delivery technology that encapsulates fine fragrance oil into alginate pearls surrounded by water. This makes it possible to create natural and vegan perfumes that feel soothing and refreshing on the skin. At the same time, it allows to achieve much higher fragrance concentration in the final product than conventional water-based formulations.



Fabian Dubler, Head of Business Development at Microcaps AG. Image courtesy of Fabian Dubler.

So, for the first time an ethanol-free perfume can hold up with ethanol-based perfumes when it comes to fragrance intensity and long-lastingness. Last but not least, the luxurious alginate pearls also look great in the bottle. This creates a completely new overall fragrance experience that will redefine the possibilities of ethanol-free perfumes.

What have been some of the key innovations in encapsulation technology over the last few years? What were the drivers of the innovation?

Simply by observing the widespread use of encapsulation technology (including fragrance encapsulation), we can say that an important aspect was the development of biodegradable products to avoid microplastics. This development mainly concerned the well-known market for fragrance encapsulation in connection with laundry products.

Our Lupearls technology is not suitable for laundry applications and was developed in a different context.

FD: One of the recent key innovations is the use of microfluidic emulsification. Microfluidic encapsulation opens a whole world of possibilities and is still only at the beginning to grasp its full potential. Another big trend in the industry of fragrance encapsulation is the focus on sustainability and functionality, with an emphasis on natural products for more health-conscious consumers and the protection of fragrances from external impact.

What are some of the limitations of encapsulation technology?

LT: In connection with encapsulation, also with fragrances, it is important to know in which application these fragrances will be used and at which time and trigger the fragrance is to be released.

Accordingly, one limitation is the suitability and stability of the capsule. In our Lupearls example, this means that the capsule must be able to be mixed homogeneously with water. It has to be stable enough not to break inside the bottle, for example during production or transport of the product to the consumer. However, it must break completely as soon as it is sprayed out and must not stick or block the spray head.

The fragrance to be encapsulated must separate well from water and must not be water-soluble in order to obtain spherical capsules of the same size that do not bleed or cause problems during storage.

There is also a limit to the loading and packing of the capsules in the matrix. A dosage of up to 25% fragrance in the product is currently possible. Higher dosages harbor a risk of instability of the capsules due to too little free space or too little liquid in the matrix.

[a]Lupearls is a trademark of Luzi

FD: Encapsulation of ingredients can be complex, and not all ingredients work well in the encapsulation process. Some ingredients can be damaged or lost during the process. In our example it is crucial that we collaborate very closely with our customers to analyze and test each ingredient they want to use in their final product. However, for our customers encapsulation still comes with many more new opportunities than restrictions. In the past, water-based perfumes had limits on the amount of fragrance oil and the overall sensory experience. Now, with Microcaps' encapsulation technology there is a solution that brings in game-changing new possibilities. Just imagine being able to create a completely new fine fragrance product through encapsulation. In the end, the challenges are small compared to the amazing opportunities this innovation brings to our customers.

From your perspective, what does the future of fragrance delivery technology look like?

LT: One important topic now and in the future of fragrance delivery technology (especially in the product range of Laundry Applications and typically used fragrance encapsulation within this field) is the biodegradability of polymers and the topic of avoiding microplastic. As presented by Mr. Andreas Künkel from BASF last October at the SEPAWA congress, the fundamental understanding of the biodegradation of polymers and the respective OECD methods is a key challenge. At the moment e.g. OECD 301 is defined as the biodegradability of more than 60% of the substance after 28 days. But maybe polymers just need additional time to decompose completely, since they are really huge molecules, it may be 60% after 54 days. So maybe an additional OECD method would be useful?

However, in my opinion, the topic of sustainability needs to be and therefore will be very closely connected to the topic of encapsulation.

There are very elegant and environmentally friendly solutions like Lupearls parfum d'eau (without any microplastic but still encapsulation technology) for fine fragrance without alcohol.

There may be other more complex applications such as laundry and requested release mechanisms in the future, some physical aspects where encapsulation may provide a simple solution.

FD: For a long time, fine fragrances have stuck to the same delivery methods because there weren't many alternatives. But now, for the first time, it is possible to offer a product that performs like traditional ethanol-based perfume while having a completely unique appearance and coming with a natural, vegan, and skin-friendly formulation. This paradigm shift will redefine the future of fragrance delivery technology for sure. Currently, we're just starting to explore the possibilities that this new technology offers. Microcaps firmly believes that encapsulated fine fragrance products will play a much larger and lasting role as a delivery system in the future, providing consumers with natural, health-friendly products that bring a breath of fresh air into a market that is always on the lookout for innovative and outstanding products.

Are there any examples of recent innovations that can point to untapped white space in the segment?

FD: A recent breakthrough innovation is "Lamar Caviar by Kajal," which launched in the last weeks of 2023. This unique perfume stands out as the first ever water-based, ethanol-free scent that is based on Microcaps' Perfume Pearls technology. Lamar Caviar offers its consumers a luxuriously intense scent that is natural, vegan, halal and delivered in a new, encapsulated form.

This innovation shows how combining new technology and a commitment to offering more value to end-consumers can transform a market towards sustainability and natural products. Microcaps is excited to support this shift through our unique encapsulation technology and our expertise in microencapsulation.

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LEADERS IN ESSENCE

What would food designed for an Ozempic world look like?

Flavorists weigh in on how the ozempic trend might influence innovation.



Ozempic is a medicine for adults with type 2 diabetes that has recently been making headlines for its weight loss benefits. Image courtesy of Natalia at Adobe Stock.

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Ozempic, a semaglutide injection designed for adults with type 2 diabetes, has become an internet sensation due to celebrities utilizing it as a weight loss drug. Research by The Capitol Group[a] shows a decline in food consumption by Ozempic users.

The research article states, "The media frenzy around weight loss drugs reached a fever pitch when Walmart's U.S. chief executive officer said that people on glucagon-like peptide-1 (GLP-1) weight loss drugs are buying less food compared to the general population."

What happens if this becomes a mass movement? What would food designed for an Ozempic world look like and what is the implication for flavor?

Perfumer & Flavorist+ tapped Bell Flavors and Fragrances principal flavorist Cyndie Lipka, ADM president of Creation, Design & Development and chief global flavorist Marie Wright and ADM senior director of Global Product Marketing, Flavors, Jennifer Zhou to weigh in.

If people eat almost 20% fewer snacks, will they spend more on the ones they buy?



Jennifer Zhou

Jennifer Zhou [JZ]: Consumer behaviors are already trending towards premiumization in health-forward eating. Weight-conscious consumers' willingness to spend on weight-loss solutions will heavily depend on their income, and access and desire to purchase healthy food and drink options. Food and beverage manufacturers are expected to prove and deliver value to consumers, including cost, functional benefits, portion sizes, sensory experience and more.



Marie Wright

Marie Wright [MW]: Much is still unknown about the long-term effects of weight-loss drugs, although consumers taking them have been shown to reduce their intake of offerings like baked goods and salty snacks. Even with a suppressed appetite, these consumers might spend more on healthier snacks and products with added functionality. This aligns with current health and wellness trends, although we can't know for sure if people will be willing to spend more.

What happens if this becomes a mass movement?



Cyndie Lipka

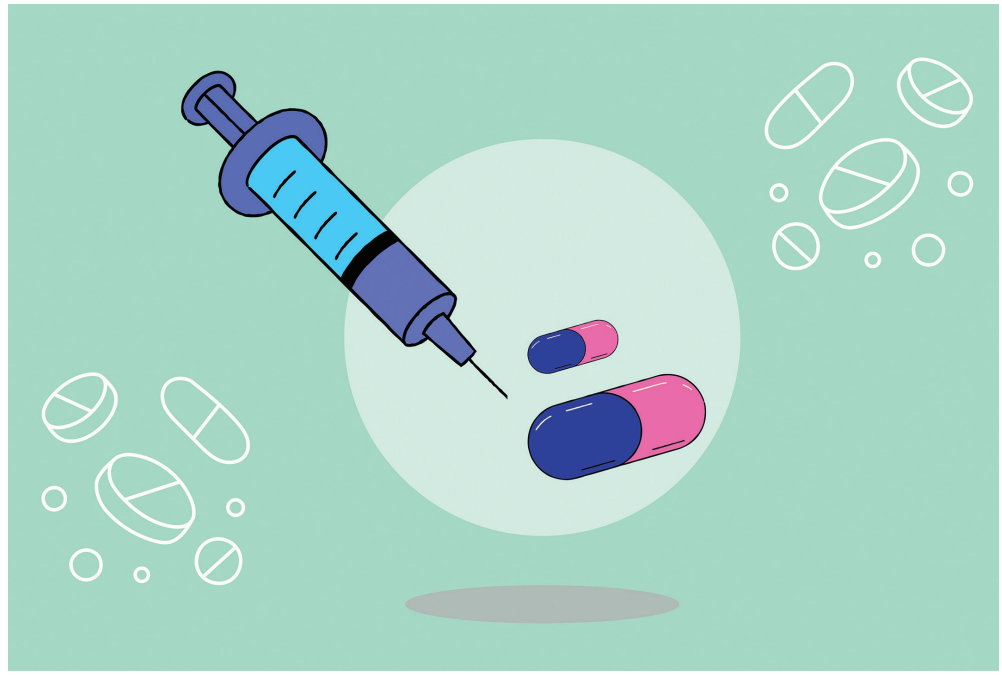
Cyndie Lipka [CL]: I've been watching this trend. The United States population has always been quick to jump on trends especially if little is required on their part. We embrace that magic pill as if we are not accountable for our actions. Ozempic was developed for people with type 2 diabetes. As a result, they have lost weight. It is an injection meant to be taken long-term and when halted, you will likely gain back that weight. However, some physicians are prescribing this for use as a weight loss tool. Sadly, there are instances where those who need this for their diabetes treatment have come up short.

Wegovy was developed by the same company for use as a weight loss tool and contains twice as much

[a]*https://www.capitalgroup.com/advisor/insights/articles/weight-loss-drugs-could-reshape-industries-beyond-health-care.html?utm_shared_to=linkedin&utm_advocacy_source=es&utm_userID=c16a3fcc-95e6-4aec-9146-bd9b35eb0c19&es_id=9660dcda7b*



of the active semaglutide. However, this one is not covered by insurance. Imagine which one people ask for. Over time the body gets used to both medications and dosages will need to increase over time as the body acclimates to it to still be effective for weight loss. I have seen one article say that semaglutide users are also taking other drugs to combat the side effects such as nausea and diarrhea.



Bell Flavors and Fragrances' Cyndie Lipka shares, "The United States population has always been quick to jump on trends especially if little is required on their part. We embrace that magic pill as if we are not accountable for our actions". Image courtesy of king at Adobe Stock.

JZ: It is still too early to tell how extensively they will impact consumer behavior, or if they will fall out of favor like previous solutions, where results couldn't be sustained without continued adherence to self-imposed lifestyle changes for both nutrition and physical exercise.

What would food designed for an Ozempic world look like?

MW: If the average person starts eating less, it stands to reason that the foods they want to eat would be the most delicious. To support overall wellness, these foods and beverages would also be high in protein, rich in fiber and include more wholesome ingredients. We would also see a greater focus on portion control, and perhaps solutions to ease digestion.

What's the implication for flavor trends?

JZ: We could see flavor trends diverging in two directions. One direction would be to create more fresh and authentic flavors in the healthy formats that consumers would gravitate towards. Taste profiles could rely on consumers' associations with various health positionings, banking on the innate links consumers make with certain flavors on certain aspects of well-being, such as citrus and immune support, ginger and digestive support or apple and heart health. Flavor modulation would be key to mask any potential functional ingredient off-notes that could take away from the overall experience, or to rebalance the full sugar, full-fat taste experience that consumers expect. On the flip side, there could be a strong desire for the taste experience of indulgence, but with more convenient product formats and lighter and smaller portions.

How might this Ozempic trend influence innovation?

CL: So, let's think about snacks and the food industry. Information may be anecdotal at this point, but let's say it's not. If I were to think about flavor trends and innovations, I would imagine that people would miss the flavors/profiles they have come to know and love. It would stand to reason that they would still want those profiles in non-snack forms. So, the indulgent profiles in protein and good-for-you foods that we see now would expand. Or, I can imagine a Doritos-crusted burger (beef, lab-grown or vegan). But will people miss the crunch they associate with the chips? Because face it, there is more than just taste going on here. My personal opinion is that this will peak and then pass.

If there is one thing, I am confident in is that our food industry to be innovative and resilient to the flighty public!

MW: We anticipate a growing focus on technologies that can create foods higher in nutrient value and that taste great. Consumers will continue to want a positive eating experience, and taste will play a larger role in food and beverage development in this space.



WPC

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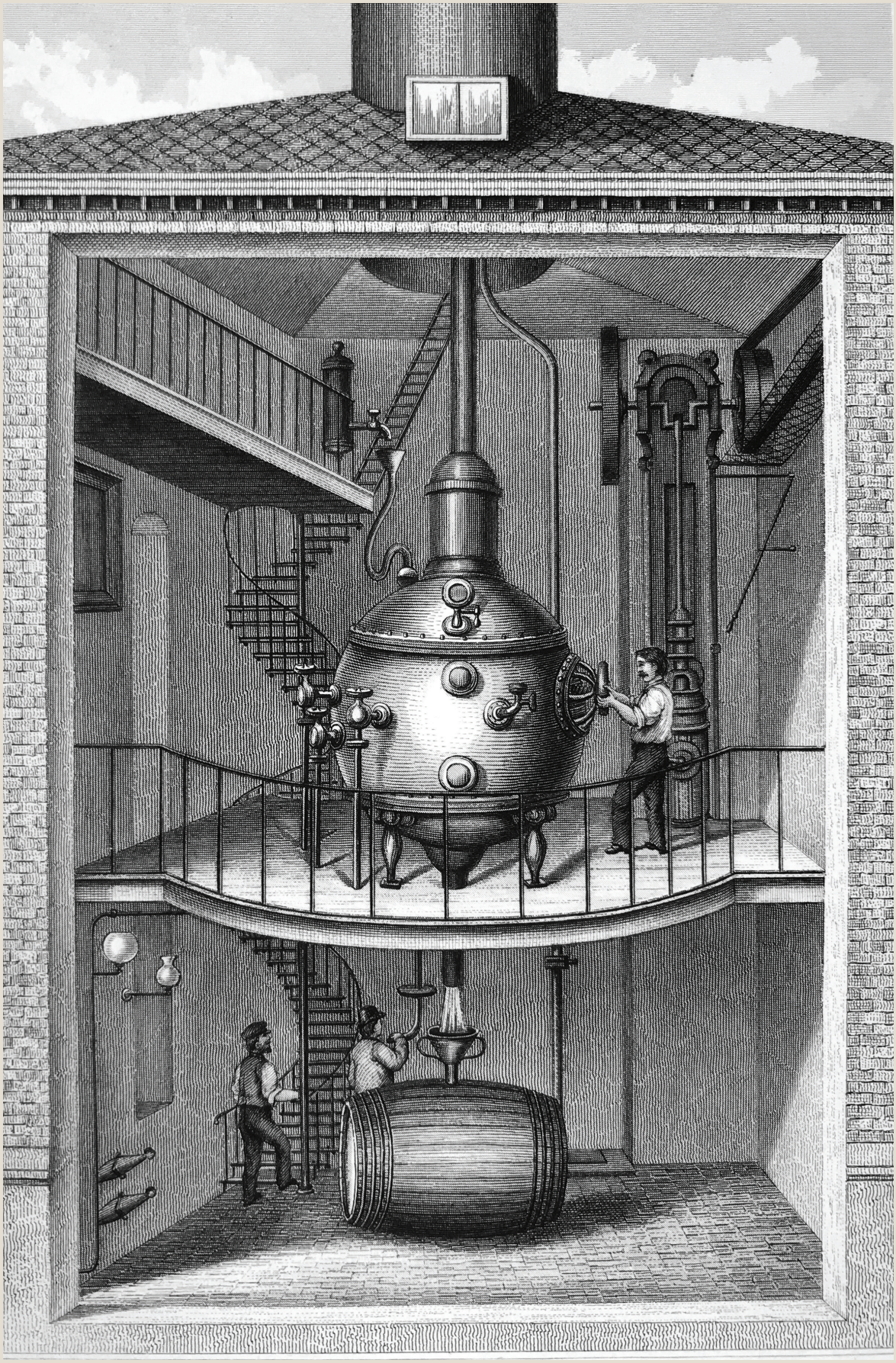
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Author Ronald Piech wanted to immortalize the Fritzsche family legacy and their early contributions to F&F (rendering of a distillation bubble).

Images courtesy of the author.

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RONALD PIECH Discusses the Creation of Cradle of an Industry Novel

Insight into the Fritzsche family's lasting legacy in the F&F industry.

Perfumer & Flavorist+ met F&F industry veteran and author Ronald Piech at IFEAT 2023 in Berlin. Piech shared his passion and knowledge of the industry, which prompted the following interview to discuss Piech's novel, *Cradle of an Industry: Scents and Flavors from Central Germany*, first published in 2022 in German—*Wiege einer Industrie: Düfte und Aromen aus Mitteldeutschland*.

The book draws a profile of the entrepreneurship of the Fritzsche family from Leipzig, which was based on initiative, internationality, inclusion of science and research, and social responsibility. It describes the development of an industry in which flourishing people from Leipzig and the region played a creative role over generations and outlines past and living activities with scents and flavors in the region.

For Piech, industrial history and cherished traditions in companies have a great deal for their future. Individual initiative, the hardships for any beginning and the success of creativity release pride.



Author Ronald Piech.

First, can you explain how you made your way to the F&F industry?

Ronald Piech [RP]: My way into this industry was rather unusual, I have no chemical background nor any attachment to the natural side of the F&F industry, however, I recall an early experience of witnessing the harvest of orange blossoms in a plantation in Tunisia's Cap Bon region, in spring 1979. It was an amazing moment to see all these hardworking women, hand-picking an endless number of flowers for the manufacture of Neroli essential oil. But for me, it was a coincidental event. After my graduation I studied Africa-related Sciences at Leipzig University and was drafted into the East German diplomatic service, stepping up its corporate ladder in the early 1970s. I spent 17 years dealing with both North- and West-African countries living nine years abroad, in Tunisia, Algeria, and Nigeria.

Click above to listen to this exclusive podcast.



Two chapters in the book describe what happened with the subsidiary that Leipzig Schimmel & Co. established and grew in New York and New Jersey between 1871 and 1900 and that soon was named Fritzsche Brothers.

It all came to an end with the downfall of the state then called the German Democratic Republic and the following German unification. I then went to join a French bank to promote their corporate business in the East German southern region. However, frustrated by a very tight risk policy that made gaining customers a vain effort, I joined one of my customer's business activities, trying to promote and sell its synthetic aroma ingredients worldwide. This was by the turn of the centuries and since then, my fascination for this industry never diminished by a dime, and is kept alive.

What was the catalyst for writing your book?

RP: Indeed, there was more than one reason that drove me. In 2000, I entered a spin-off of the ancient company in Miltitz near Leipzig town located on the ancient factory's site in some of the impressive historical buildings; this gave an idea about the wealth the entrepreneurs had earned compared to other industries, which enabled them investing in such wonderful industrial buildings. As a Leipzig-born person, I had never before heard about this company on the edge of town, its traditions and the international role it played throughout more than a century. In a profession completely unknown to me, one of my motivations consisted of delivering a contribution to bringing back a tiny part of this ancient resplendence to the place from where it emanated: Leipzig. For more than 40 years In East Germany, there was a society model that oppressed private initiative. Entrepreneurship had no value. And 40 years is indeed a long time for actively and willingly destroying traditions as the legacy of Schimmel & Co.

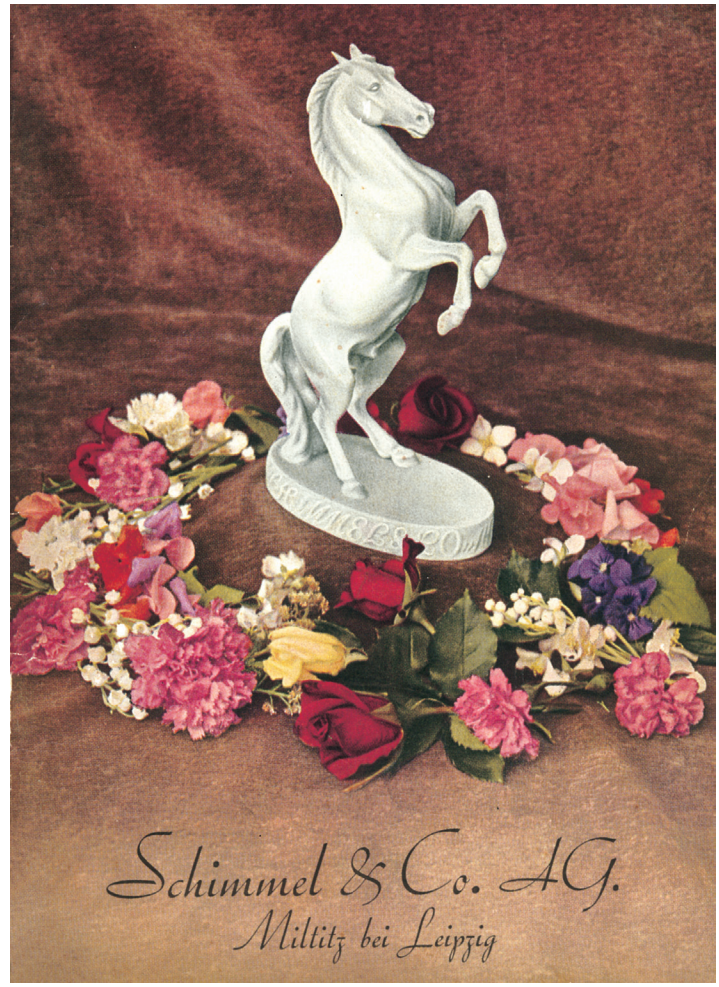
On the other hand, I heard and read so many things about the unique and international pioneer role the company played for at least more than a hundred years, and later said to myself that actually, this particular story needs to be immortalized somehow. For me, industrial history and cherished traditions in companies have a great deal for their future. Individual initiative, the hardships for any beginning and the success of creativity release pride. Being proud of the ancestor's performances, especially if it starts as a family business, gives a unique and solidly backed motivation for future challenges. And in general, it is good to know the roots one comes from, for defining new horizons.

This may be an encouragement for all those with a similar approach as far as they are in countries with a long tradition in this industry like France, Spain and others. They may dig out their traditions since little we know about the beginnings and developments of this industry way back. While discussing the issue with customers and colleagues, the question came up whether there is something that has been written about this story. A friend told me that the "American adventure" of this corporation was completely unknown in the United States and actually should be written down before it vanishes. He was not the only one who argued in this sense, thus promoting the idea of preserving the whole history, since others joined him. Finally, I decided to dare it myself, while using the stories that many people told me, as well as details and documents I collected throughout 20 years.

Since in these early years, all players had to pass the same typical pathways requested by this industry wherever it was settled, they all erected similar capabilities for distillation, blending, and later on to fabric synthetic ingredients. These steps were comparable in all places of the branch, therefore the description of Schimmel & Co.'s industrial development is far from being a navel–gazing view for the Leipzig plant but illustrates particularly through numerous illustrations what all companies in this business had to go through, at this way back time. And this might still be of some interest today. So far, for describing the "catalyst".

Through your research and interviews, how has the industry come into existence in the United States?

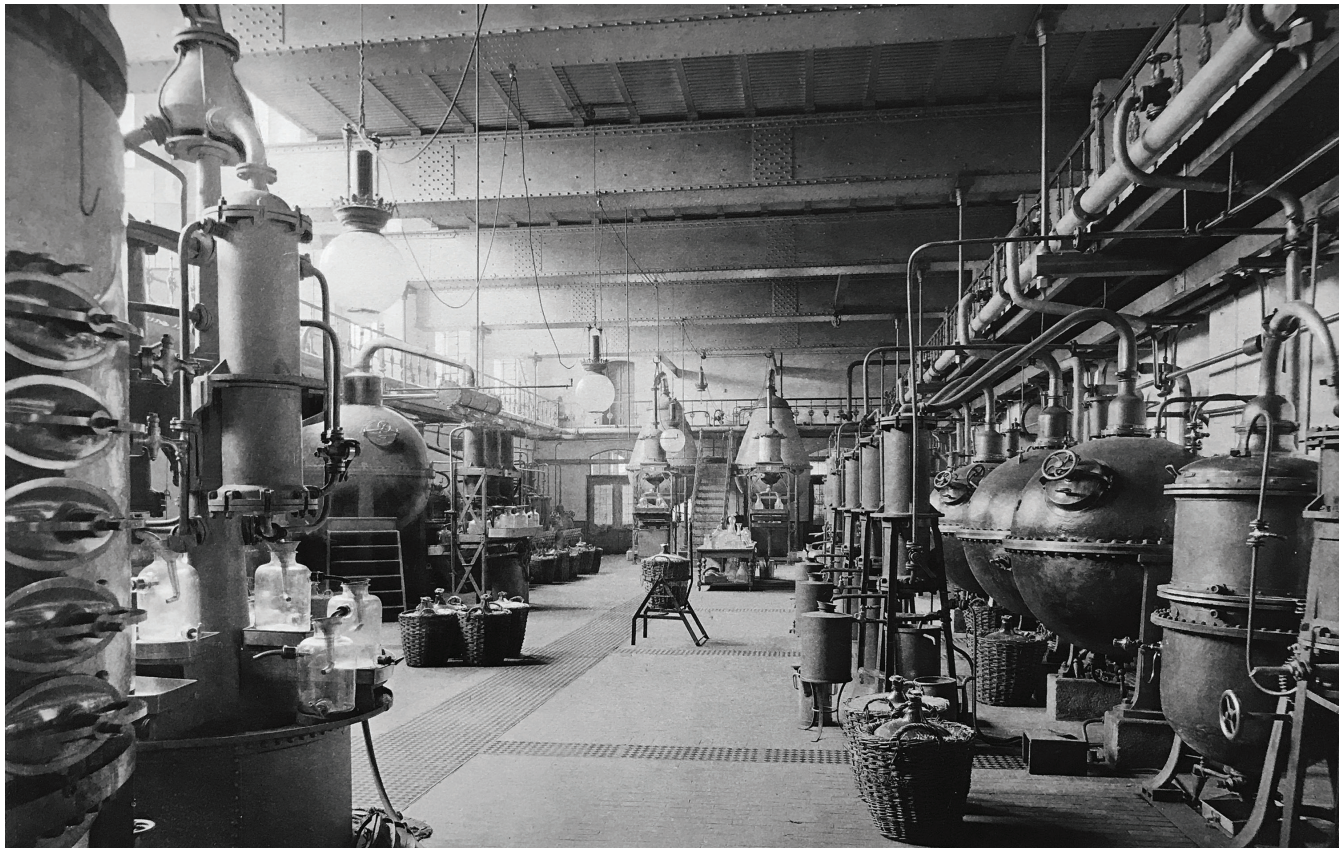
RP: Two chapters in the book describe what happened with the subsidiary that Leipzig Schimmel & Co. established and grew in New York and New Jersey between 1871 and 1900 and that soon was named Fritzsche Brothers. Fritzsche was the name of the owner family of the Schimmel venture in Leipzig, its U.S.-subsidiary later got a reputation as Fritzsche, Dodge and Olcott. In the beginning, it was a pure trading affair for essential oils imported from Europe, especially Germany, and later the manufacture of flavors and fragrance material started in factories built for the purpose and under the guidance of the Leipzig-based German company. By that time, Dodge & Olcott existed already, as an importer and distiller of natural material. As the first American company in the business, the venture came into existence some years after America's independence, around 1798 or even earlier. Dodge ran a trade with herbs, oil and paramedical ingredients and began distilling around 1850 too, as many tiny American family companies, based on material from local crops.



After almost 200 years, the spirit of Schimmel & Co is still alive in the Leipzig region.

Probably and by the time Fritzsche Brothers expanded, other manufacturers and traders came along with similar activities, in particular the UNGERER company, established in 1893, being part of Givaudan today. I have no real clue about what happened in this American industry from the 1920s onwards and later. Related to the book's story, I focused on what became of the Fritzsche Brothers who for a long time must have been among the most significant U.S. companies in F&F. The second chapter gives an outlook on their activities. Fritzsche bought Dodge and Olcott in the early 1950s and the later brand became Fritzsche, Dodge, Olcott (FDO). This corporation was acquired by BASF in 1980 and belongs to Givaudan since 1990 (East Hanover plant).

The content of chapters emanates from information by the last Director of Operations of FDO, Al Dicara, who helped me discover the "American Part" of the Schimmel story. Without his input, these chapters would never have come into existence and I am very grateful for this



Since in the early years, all players had to pass the same typical pathways requested by this industry wherever it was settled, they all erected similar capabilities for distillation, blending, and later on to fabric synthetic ingredients.

important contribution. I am also grateful to another American, Archile Riviello, Ph.D., who directed and edited the book's wonderful translation in English.

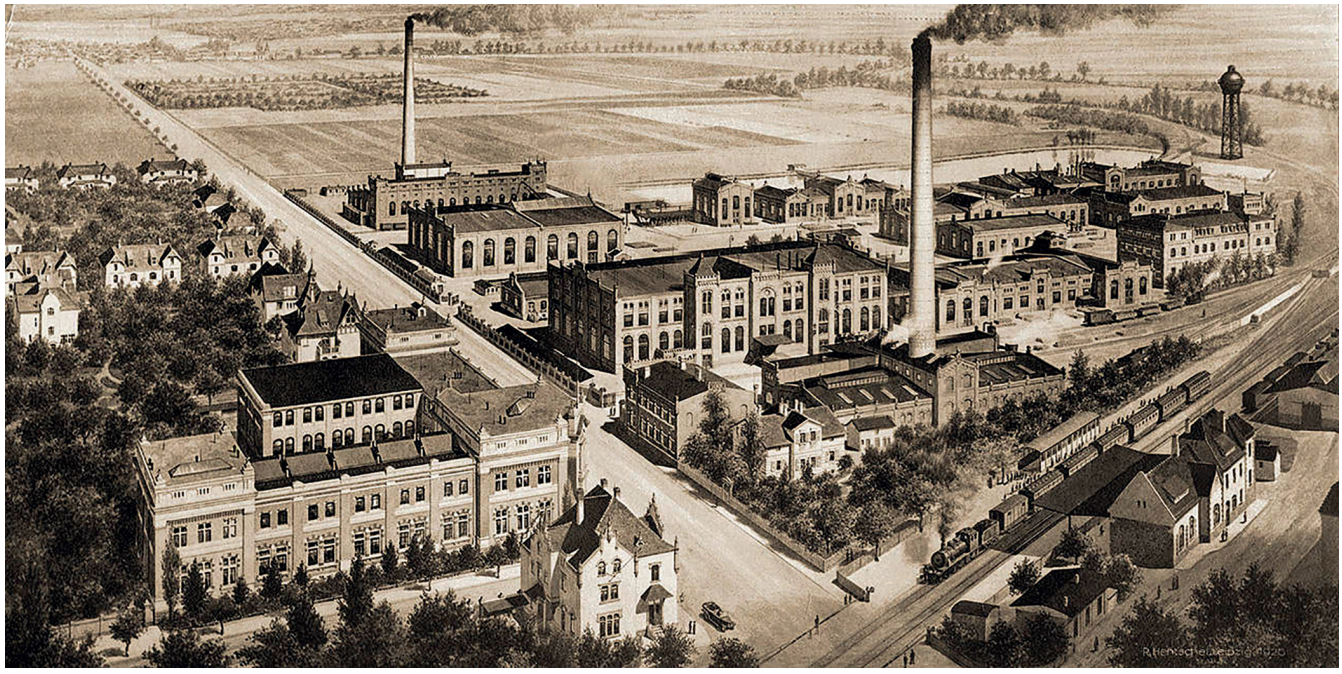
Can you highlight some of the major plot points in the novel that F&F professionals would be keen to learn or benefit from?

RP: For me, the major plot in the book was to highlight the inventiveness and purposefulness of an entrepreneurial dynasty that never weakened its role as a pioneer and sought to bring to perfection what others did as well, only to a certain degree, and thus keeping them at a distance.

This began with particular efforts that were made to analyze the constituents of essential oils for obtaining necessary data, at a time when other producers were yet satisfied with mostly judging materials only by smell, taste, color and sometimes by solubility in alcohol. This also applies to the courage to invest money in new ideas and scientists, in newly developed equipment with which the findings could be implemented on an industrial scale. Later, this also involved creating the conditions for doing synthetic aroma chemicals without neglecting the business with naturals. For a long time, this enabled Schimmel to play a pioneering role in a broad line. Of course, it is up to each potential reader to pick out things that are of individual interest. This however presupposes a fundamental interest in the history of this industry. I seize the opportunity to quote some international opinions from partners in the industry to whom the book was sent to honor long relations on a personal but mainly business level with my former employer Miltitz Aromatics GmbH. There were some lovely returns as: "For your information, I have a copy of your book on my desk! I feel like a library as several have noted it and asked to borrow" or "[…]an amazing job of chronicling the history of Schimmel and Fritzsche-FDO and so much more, I learned a great deal and have only touched the surface[..]" to continue "[...]this company played a very important role in the modernization of entire value chains, from plant cultivation to chemicals[...]" or furthermore "[…]I have been reading the book off-and-on for the past week learning so much about our industry [...] I had no idea of the intense work that the German chemists and farmers had done in the 19th century [...]



A close up shot of the external factory equipment in Miltitz, Germany.



View of the functioning factory in the bustling city of Miltitz, Germany.



Cradle of an Industry draws a profile of the entrepreneurship of the Fritzsche family from Leipzi.

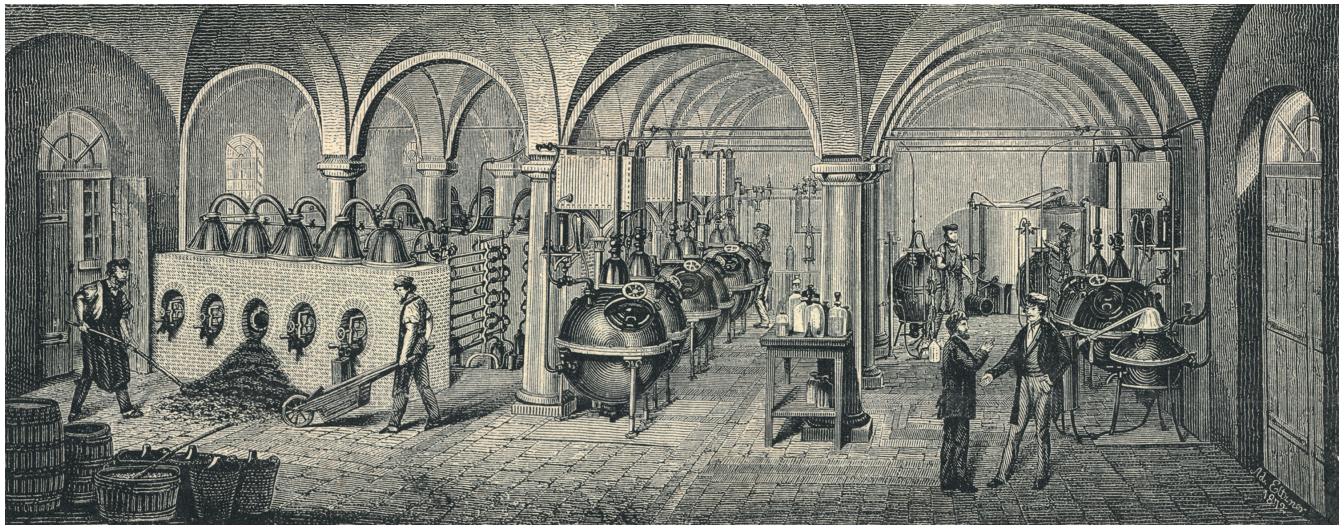
Incredible. I am in wonder of this industriousness[...]" and to end the enumeration "[…] with this book, the author has created something unique. It contains and illustrates[...] numerous, previously unheard-of information embedded in the historical background of the last 180 years. The pioneers of that time, who were still equipped with sometimes adventurous chemical knowledge but an extremely entrepreneurial spirit, laid the foundation for [...] a piece of future living culture. In my opinion, the book is on the same level as Günther Ohlof's *Fragrances: Signals of the Emotional World*, which is a classic of perfume literature".

Can you touch on some examples of how you've witnessed the industry evolve since you first entered?

RP: When you are directly involved in changes and new challenges that your industry is concerned with, day by day, you need to master them or you will fail. Changes of the last 20 years have become a reality and precondition for any daily business today. So, in the end, you can't even remember that there were times when it went the other way, especially because these changes evolve over long years, little by little. Let me focus on three phenomena I witnessed throughout the years I spent in this industry.

The first thing I recall and was confronted with, was the move of chemical industrial processing towards China and India, starting in the 1990s. Many companies, including F&F manufacturers transferred parts or the whole manufacturing of aroma chemicals to there and dedicated their own factories to other fine chemicals unless they closed them down. Their particular know-how acquired through decades on steering these special processes went lost and only a handful of companies maintained such production in Europe. Miltitz Aromatics is one of the few to implement such structures again if suddenly the Far East fails, is a headache when experiences and appropriate equipment are no longer in place. They cannot be activated again simply based on some chemical formula and finger snipping. The harsh price competition was another serious issue.

The second phenomenon concerns the concentration process in this industry. In the beginning manifold family ventures with long traditions were concerned. They had many hesitations to enter this path. In my time, this happening began with actions among bigger



A rendering of a F&F factory's production room.

players, i.e. in 2000, when BBA went to IFF, then in 2003, Haarmann & Reimer merged with Dragoco, and in 2006, when Quest was acquired by Givaudan. These developments went on until today and they obviously do not stop. A lot of ideas are always lost during these mergers, and by chance, some may re-appear and continue to live elsewhere.

The third observation I want to mention is this bulk of regulatory affairs that created and continues to create more and more headaches, year by year, and among them the REACH regulations. I do not want to comment on this, but all has certainly become a big burden for many companies and makes business more difficult compared with the decades before. It certainly generates disadvantages for global acting ventures. Authorities have been established to draft and promote the implementation of all these regulations and observe that everything complies. On the other hand, the seemingly never-ending bunch of ingredient bans creates serious headaches for perfumers and flavorists for their applications within the various supply chains.

However, even if many things in this business have become very uniform, it is still an amazingly variable and fascinating industry with an impressive history. The book should contribute to the latter. After almost 200 years, the spirit of Schimmel & Co. is still alive in the Leipzig region as two companies emanate from its roots. Editing and printing of *Cradle of an Industry* was made possible by them and so I am grateful to Bell Flavors & Fragrances GmbH in Leipzig and Miltitz Aromatics GmbH in Bitterfeld, as the actual "spiritual heirs" of this tradition that continues since both manufacturers are embedded in the flavor and fragrance industry.

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Current and Evolving Legislation Influencing Fragrance Ingredient Regulations

2024 will be a year of transition and there will be many new faces in the European Parliament as well as a reset of the political agenda.



What's next?: In December 2023, a provisional agreement was reached by the European Parliament and the Council of the EU on the revision of the CLP Regulation. Image courtesy of Belish at Adobe Stock.

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Over the last two years, the F&F industry has been closely following the evolution of the EU Green Deal as well as the Classification, Labelling and Packaging of Chemical Substances and Mixtures revision (CLP Regulation). In December 2023, a provisional agreement was reached by the European Parliament and the Council of the EU on the revision of the CLP Regulation.

Perfumer & Flavorist+ connected with Catherine Crowley, IFEAT Executive Committee chair in early January to discuss how current and evolving legislation can influence fragrance ingredient regulations.

At the end of 2023, the fragrance industry was anxiously waiting for the revisions of the CLP Regulation. Can you share a brief synopsis of the revision announcement and how it impacts the fragrance industry?

Catherine Crowley [CC]: Thanks to more than two years of constructive dialogue between our industry sector, including IFEAT and EFEO, and the EU institutions, the provisional agreement is a significant improvement from the initial proposal. Most importantly, a derogation from the mixture rule has been granted for natural essential oils and related products under the revision of the CLP Regulation. This agreement brings much-needed business certainty to our industries, ensuring the continued safe use of essential oils that are widely used by the fragrance sector. This outcome protects not only micro, small and medium-sized companies (SMEs) and the related local rural economies in many parts of Europe, but it also ensures that other downstream users and players in the fragrance value chain can continue operating as usual.



Catherine Crowley, IFEAT Executive Committee chair. Image courtesy of IFEAT.

With 2024 being an election year for the EU Parliament (EP), how does this affect the fragrance industry on the regulatory front?

CC: The elections will take place between June 6-9, 2024. This means that between campaigning and finalizing ongoing dossiers before the last voting session of the Parliament in April, the attention span for new regulatory initiatives is limited. The European Commission has already announced that the revision of REACH will be dealt with in the next Parliament, but it will still present its proposal for the revision of the Cosmetic Product Regulation in February. While the current Parliament is unlikely to commence working on this file due to the already very tight agenda to wrap up ongoing work, it gives our sector time to analyze and evaluate the impact of the proposal and enter into conversation with the Commission and Member States. In addition, we need to keep in mind that the derogation for truly natural essential oils and related products under the CLP revision will be the subject of a European Commission scientific report to be published within five years after the adoption and an amendment could be proposed if necessary. That means our priority for 2024 will be to continue collecting scientific evidence, complemented by further independent studies, demonstrating that the derogation is justified.

> “Once the dust has settled after the elections, the new grouping of policymakers in the European Parliament is also an opportunity for us to gain new supporters for our sector.”

What are some of the challenges the fragrance industry faces in maintaining an open dialogue with EU institutions?

CC: 2024 will be a year of transition and there will be many new faces in the European Parliament as well as a reset of the political agenda. In the next weeks and months, we can expect Parliament to be busy with finalizing ongoing dossiers and with campaigning, while the Commission services are preparing for the next term as well. It will be difficult to attract policymakers' attention unless we ensure our issues resonate with them. Throughout the year, we will continue to engage with the Member States and give input to the European Commission on the revision of the Cosmetic Products Regulation as well as the EC's scientific report on the derogation of essential oils. Once the dust has settled after the elections, the new grouping of policymakers in the European Parliament is also an opportunity for us to gain new supporters for our sector. Our concerns are deeply rooted in the communities and constituencies of many MEPs, this aspect greatly assists our advocacy efforts as an industry.



[IFEAT's] priority for 2024 will be to continue collecting scientific evidence, complemented by further independent studies, demonstrating that the derogation is justified. Image courtesy of Daniel Jędzura at Adobe Stock.

The open letter from IFEAT and EFEO mentions a European Commission (EC) scientific report, could you share what that report will include and its importance?

CC: Part of the political agreement underpinning the preliminary text for the CLP revision is that the derogation from the mixture rule for essential oils and related products will be the subject of a European Commission scientific report. This is not out of the ordinary: the European Commission will most likely draw up the scope of this report and mandate ECHA (the European Chemicals Agency) to conduct studies, collect evidence and hold stakeholder consultations before sharing their assessment with the Commission. The Commission will aim to publish the report within five years after the adoption. Depending on the findings, the Commission could decide to propose an amendment to the current derogation.

Considering this process, it highlights how crucial it is that we continue our dialogue with EU institutions, collecting more scientific evidence and facilitating further independent studies. These combined efforts are what is required to ensure it is demonstrated that the derogation is justified.

What do the next few years entail for the fragrance industry on the regulatory front?

CC: Our priority in 2023 was to ensure a positive outcome for the essential oils industry in the CLP regulation, which was successfully achieved, but our work is still ongoing. We will be looking at several EU proposals coming through this year that may affect the fragrance industry. The upcoming revisions of REACH and the Cosmetic Products Regulation are two of these. The trend under the current Commission was a precautionary approach to chemical regulation, moving away from a risk-based to a hazard-based approach. Clearly, the objectives of protecting human health and safeguarding the environment are ones we all aspire to, but some of the past proposals overlooked the unintended consequences of the wording of the language, which could have posed serious challenges to essential oils falling under hazard classifications, for example. We expect the next Commission to continue implementing the European Green Deal, but we see our increased dialogue resulting in a much more positive and pragmatic process along the way. We continue to use these key opportunities to engage with decision-makers, explain our concerns and our position, and present ourselves to policymakers as partners in solving the most pressing challenges we are all facing as a human community. As an industry, we can be a force for good to uphold the highest standards to protect human health and the environment, while avoiding unnecessary restrictions and administrative burdens on our sector.

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HOW SOCIAL MEDIA WORKS AS A PREDICTOR FOR TRENDS IN BEAUTY AND FRAGRANCE

Spate co-founder Yarden Horwitz to discuss social media trends, key formats and olfactory notes on the rise in the United States and white space ripe to explore in 2024.



TikTok conversations about fragrances have consistently grown, defying typical seasonal patterns. This suggests brands should actively participate in these ongoing discussions on TikTok to boost awareness. Image courtesy of Frenchiebuddha at Adobe Stock.

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Perfumer & Flavorist+ connected with Spate co-founder Yarden Horwitz to discuss how social media can work as a predictor for trends in beauty and fragrance, key formats and olfactory notes on the rise in the United States and white space ripe to explore in 2024.

Social media (TikTok in particular) is working as somewhat of a crystal ball for evolving beauty and fragrance trends. From your perspective, how can the beauty and fragrance industry capitalize on social media's influence?

Yarden Horwitz [YH]: Perfume-related hashtags get an average of 331.2 million views weekly in the United States, highlighting the significance of fragrance discussions on social media. At Spate, our analysis of the fragrance category over three years reveals distinct trends in Search versus TikTok engagement. Fragrance searches remain seasonally influenced, showing peaks around holidays. In contrast, TikTok conversations about fragrances have consistently grown, defying typical seasonal patterns. This suggests brands should actively participate in these ongoing discussions on TikTok to boost awareness. However, it's crucial to recognize that Google searches reflect purchase intent. Despite year-round fragrance talks on TikTok, purchasing still occurs during holiday seasons.

"TikTok conversations about fragrances have consistently grown, defying typical seasonal patterns. This suggests brands should actively participate in these ongoing discussions on TikTok to boost awareness. TikTok conversations about fragrances have consistently grown, defying typical seasonal patterns. This suggests brands should actively participate in these ongoing discussions on TikTok to boost awareness."

What are some of the key formats and olfactory notes consumers are hungry for in the U.S. fragrance market?

YH: Across consumer preferences in scent profiles and benefits, pheromones are leading in popularity with an average of 122.4K monthly searches. Vanilla is a close second, seeing 110.1K searches on average each month.



The rising popularity of vanilla and musk indicates a revival of classic notes.



Even in a crowded market, consumers' willingness to experiment suggests they are open to exploring new fragrances that resonate with their preferences.

There is notable rising interest in pheromone oils and musk perfumes as well, with increases of +23.4% and +10.3% year-over-year (YoY). This emphasizes both popular scent and format (oil in this case).

How do those demands inform new formulations or opportunities for innovation?

YH: The rising popularity of vanilla and musk indicates a revival of classic notes. This trend — coupled with the increased interest in pheromones — shows a consumer preference for sweet and attraction-enhancing scents. This presents an opportunity for brands to rejuvenate classic fragrances that fit the bill. Innovations could include 'flanker' fragrances that cater to new consumer preferences by incorporating a newly popular note.

From your perspective (and research) what is the white space ripe to explore in 2024 in beauty and/or fragrance?

YH: Brands should continue investing in subscription services or offering miniature and travel-sized fragrances. Despite the competitive nature of the sampling market already, the ongoing consumer trend of 'try before you buy' emphasizes the importance of providing options that facilitate experimentation. Additionally, brands should pay attention to the fragrance notes mentioned earlier. Even in a crowded market, consumers' willingness to experiment suggests they are open to exploring new fragrances that resonate with their preferences.

Any radical shifts you're predicting in 2024 in terms of consumer demands? What are the driving factors?

YH: As hyper-experimentation in fragrance choices gains popularity, the appeal of having a signature scent diminishes. Brands will benefit from directing their marketing strategies towards the growing trend of experimentation. Highlighting how different fragrances align with specific occasions or moods can be effective. While modern consumers may have favorite scents, they are increasingly moving away from the idea of a single everyday fragrance. The goal for brands shouldn't be to become the sole choice, but rather to distinguish themselves amongst a crowd.

p&f+

Maximizing Your World Perfumery 2024 Experience According to A Perfumer

Delphine Perdon Rupnow says, "*WPC* is THE place to be for perfumers and fragrance professionals of the world, without boundaries."



"I am eager to see what new ingredients are going to be presented at the show, what will inspire us as perfumers, and what trends are common between the different markets."

The *World Perfumery Congress* (*WPC*) is the global stage for fragrance creativity, ingredients, technology and business—providing the ideal forum for discussing the industry's latest issues and breakthroughs. The three-day event hosts an expo hall, networking opportunities and conference sessions.

>>Registration is now open.<<

We connected with Bell Flavors & Fragrances perfumer and American Society of Perfumers (ASP) board of directors member Delphine Perdon Rupnow to discuss how to best maximize your *WPC* 2024 experience. Registration for the three-day event will be opening soon!

As the next installment of the *WPC* approaches, how would you describe the event to someone who has never been before?

Delphine Perdon Rupnow [DPR]: *WPC* is THE place to be for perfumers and fragrance professionals of the world, without boundaries. A place to connect all together, exchange ideas, and visualize the future of the perfume industry. All brought to you by Allured and the American Society of Perfumers!

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Can you share what the biannual event means to you?

DPR: It's an exciting global gathering of people who share the same interests—all revolving around scents and creativity. A friendly event taking place in a trendy location, where everyone is looking forward to showcasing and smelling new ingredients and fragrant ideas. It's the biggest perfumery networking event on the planet!



Bell Flavors & Fragrances perfumer and American Society of Perfumers board of directors member Delphine Perdon Rupnow; image courtesy of Bell Flavors & Fragrances.

What advice would you give to an attendee to maximize their experience at *WPC*?

DPR: As an attendee, I would make sure to check the speaker's program and plan to attend as many talks as possible. Then, be aware of the list of exhibitors, to better connect with all the major players of the industry, and the numerous suppliers. And of course, I would visit the American Society of Perfumers' booth for some great discussions, goodies and surprises!

What aspects of *WPC* are you looking forward to the most at the 2024 event in Geneva?

DPR: I am eager to see what new ingredients are going to be presented at the show, what will inspire us as perfumers, and what trends are common between the different markets. I have a strong interest in finding out how sustainability continues to be a centerpiece for the future of creation, as the world is facing unprecedented ecological and human challenges.

From your perspective, what is the future of fragrance? Any micro or macro trends you are seeing influencing innovation?

DPR: More than a trend, I am utterly convinced that fragrances will become even greener and more sustainable. Consumers are concerned about the future of our planet, and their health, and it reflects on the way they buy products and live their lives. The fragrance industry has a responsibility to lead the way.

Sustainable ingredients will continue to thrive, and we, perfumers, have a key role in understanding how to use them to create beautiful scents while committing to strict guidelines to protect the next generations.



Don't miss out on early bird rates for the three-day conference, rates varying depending on the professional category.



Utilize the WPC expo hall to explore, be inspired and reconnect with your fellow creatives.



WPC exhibitors go above and beyond to create showstopping booths filled with the latest ingredients and technologies the fragrance industry has to offer.

Take a Look at The Growing List of Exhibitors[a]

Speaking of sparking inspiration, *World Perfumery Congress* features a bustling expo hall showcasing unique fragrance ingredients from every corner of the globe, as well as the latest scent technology innovations. To make the most out of your ***WPC*** experience, visit *www.world-perfumerycongress.com* to get acquainted with the floor plan. You can search by product category, save exhibitors, products and other things you want to remember with a free My Show Planner account.

Are you looking to expand your customer base? Don't miss your chance to connect with key decision makers at fragrance houses and brands from around the world. There is still time to secure a booth for your company! Contact Paige Crist (pcrist@allured.com).

- A. Fakhry & Co.
- ACS International
- Agrumaria Corleone SpA
- Agrumaria Reggina
- Ajmal Biotech Pvt Ltd.
- American Society of Perfumers (ASP)
- Aquila Organics Pvt Ltd.
- Arora Aromatics Pvt Ltd.
- Associate Allied Chemicals
- Aurashine Essentials PVT Ltd. (fka Aditi International)
- Australia Lemon Myrtle Products Pty Ltd. Trading As Australian Native Products
- Azelis
- BASF SE
- Bedoukian
- Berjé
- Bernardi Group
- Bio-Young Aromas Co., Ltd.
- BMV Fragrances Pvt Ltd.
- BW Confidential
- Capua 1880 Srl
- CILIONE
- Cinquieme Sens
- CONTEXA
- Cosmo International Fragrances
- dsm-firmenich
- Ernesto Ventós S.A.
- Evolva
- Expression Cosmetique
- Floral Concept
- FnF Surplus
- Fragrance Creators Association
- FRICKE Abfülltechnik GmbH & Co. KG
- Galbanum Oil Fragrance
- Givaudan

[a]List of participating exhibitors as of January 22, 2024.



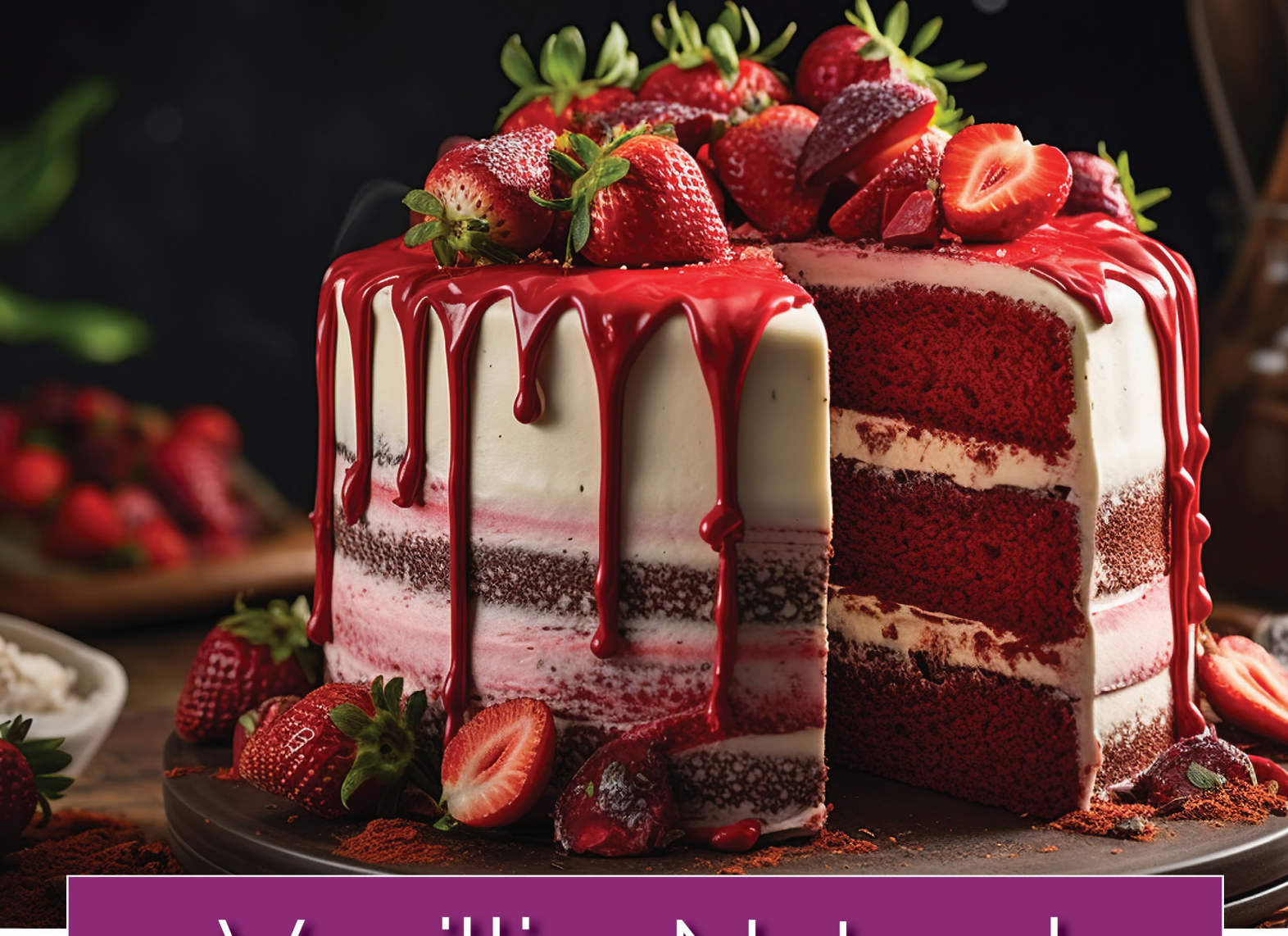
IFF's booth at the World Perfumery Congress 2022 in Miami.

- Guilin Four Seasons Sunshine F&F
- Herbochem Industries Pvt Ltd.
- I.E.S Ingredients
- ilitakao
- Indesso Aroma
- INDO World
- International Flavors & Fragrances
- Jayshree Aromatics Pvt Ltd.
- John Kellys (London) Ltd.
- Kateko Ltd.
- Lecheq F&D LLC
- MANE
- Michael Edwards / American Legends
- Misitano & Stracuzzi SpA
- Moodify
- Mueller AG Verpackungen
- Nez
- ONEWORLD Corporation (P) Ltd.
- OQEMA
- Osmose
- Padmini Aromatics
- *Perfumer & Flavorist+*
- Petorose Alcones Pvt Ltd.
- PRIMECHEM CO., Ltd.
- Rakesh Sandal Industries
- RAX Group
- Sacheerome Fragrance & Flavour
- Saraogi Shellac Group
- Scentis
- Symrise AG
- Synarome
- TadimetyA Aromatics Private Limited
- TTT Biological Agarwood JSC
- Vanwyk Systems B.V.
- Vimal Intertrade
- VTA GmbH & Co. KG
- Wanxiang Technology Group Co., Ltd.

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

- NATURAL 2-ACETYL PYRAZINE
- NATURAL CITRONELLIC ACID
- NATURAL AMBRETTOLIDE
- NATURAL INDOLE
- NATURAL ANISYL ACETATE
- NATURAL ANISYL BUTYRATE
- NATURAL BISABOLOL
- NATURAL BORNEOL
- NATURAL BUTANETHIOL
- NATURAL BUTYL BUTYRATE
- NATURAL BUTYL CAPROATE
- NATURAL BUTYL BUTYRYL LACTATE
- NATURAL BUTYL CAPROATE
- NATURAL CADINENE
- NATURAL CAFFEIC ACID
- NATURAL CAPSAICIN USP
- NATURAL CARAMEL FURANONE
- NATURAL DELTA-3-CARENE
- NATURAL ALPHA-CARYOPHYLLENE
- NATURAL 1,4-CINEOLE
- NATURAL CINNAMIC ALCOHOL
- NATURAL CINNAMIC ALDEHYDE
- NATURAL CINNAMYL CINNAMATE
- NATURAL CINNAMYL ISOBUTYRATE
- NATURAL CINNAMYL PROPIONATE
- NATURAL PARA-CRESOL
- NATURAL TRANS-2-DECENOL
- NATURAL DIHYDROCARVONE
- NATURAL THIADINE
- NATURAL 2,3-DIMETHYL PYRAZINE
- NATURAL OCIMENE
- NATURAL 2,6-DIMETHYL PYRAZINE
- NATURAL DISODIUM SUCCINATE
- NATURAL TRANS-2-DODECENAL
- NATURAL DODECYL BUTYRATE
- NATURAL ETHYL ANISATE
- NATURAL ETHYL BUTYRATE
- NATURAL ETHYL CAPRYLATE
- NATURAL ETHYL CYCLOPENTENOLONE
- NATURAL ETHYL HEPTOATE
- NATURAL 2-ETHYL-2-HEXENAL NATURAL
- NATURAL ETHYL-3-HYDROXYBUTYRATE
- NATURAL ETHYL-2-HYDROXYCAPROATE
- NATURAL ETHYL ISOVALERATE
- NATURAL ETHYL LAURATE
- NATURAL ETHYL LEVULINATE
- NATURAL ETHYL LINOLEATE
- NATURAL ETHYL-2-METHYL BUTYRATE
- NATURAL 2-ETHYL-3-METHYL PYRAZINE
- NATURAL ETHYL-3-METHYL THIOPROPIONATE
- NATURAL ETHYL PHENYL ACETATE
- NATURAL ETHYL STEARATE
- NATURAL FURFURYLIDENE ACETONE
- NATURAL HELIOTROPIN
- NATURAL HEPTANOIC ACID
- NATURAL HEPTANAL
- NATURAL 3-HEPTANOL
- NATURAL TRANS-2-HEPTENAL
- NATURAL HEPTYL ACETATE
- NATURAL HEPTYL ALCOHOL

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

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