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From Art to Applied Science: Natural Extracts for a Curated Sensory Experience on page 30.

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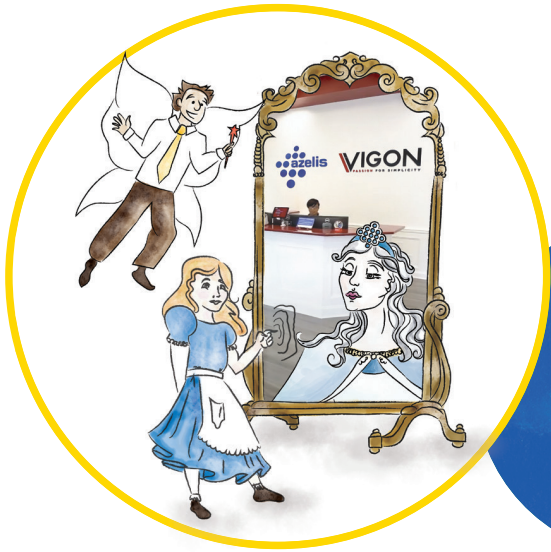
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On the Road with *Perfumer & Flavorist+*



You can find footage from our travels by following P&F+ *on LinkedIn, Facebook and Instagram.*

Perfumer & Flavorist+ (*P&F+*) started the year off with a few F&F travel experiences throughout the United States! First, I, alongside my trustee companion and *P&F+* associate publisher Paige Crist, took a trip to the Bronx, New York, to visit Delbia Do Flavors & Fragrances and had a chat with *P&F+* advisory board member and perfumer Darryl Do. He shared his strategy to prepare for the *World Perfumery Congress* 2024 (*WPC*) this summer:

"I'll be doing a little bit of research because there may be companies there that haven't exhibited before that I will definitely want to hit. Even people I know are sure to have surprises in store and may be hosting an interactive booth or showcasing never-before-seen materials. It's always fun to see the existing companies and what they're pitching which makes perfumers feel like a kid in a candy store."

You can discover the growing list of exhibitors by visiting *www.worldperfumerycongress.com*. Be sure to register ASAP to secure the best ticket prices.

In early February, I attended the American Cleaning Institute's Annual Convention (ACI) in Orlando, Florida. This was a first for *P&F+* and I was so excited to explore the use of fragrance technologies in cleaning, home care and laundry care products. I also got to experience the Charity Duck Race, which was quite the spectacle and enjoyed by all for a good cause. Readers can find a recap of our first-ever visit to the ACI Convention on **page 26** of the April issue.

Just a week later, Crist and I were back on the move to New Orleans, Louisiana, for the Alcohol Flavor Forum jointly hosted by The Society of Flavor Chemists (SFC), National Association of Flavors and Food-Ingredient Systems (NAFFS) and Chemical Sources Association (CAS). I was asked to moderate the Sazerac R&D team panel, digging into the brand's relationship with flavor houses and formulations. You can find footage from our travels by following *P&F+* on LinkedIn, Facebook and Instagram.

Flavorcon 2024

Speaking of events, *Flavorcon* 2024 is gearing up for its return to Atlantic City, New Jersey. Be sure to mark your calendar for October 8-9! We will be having a live organoleptic panel the day before (October 7), and lunch will be included with this year's panel registration. Don't forget—members of the SFC, British Society of Flavourists and the Women in Flavor and Fragrance Commerce receive discounted rates. Visit *www.flavorcon.com* for more information. More information regarding speakers, conference sessions and exhibitors to come. Stay tuned!



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Ingredients



Methyl Mercaptan

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Methyl mercaptan (FEMA# 2716, CAS# 74-93-1) is a secret weapon when it comes to vegetable, meat and coffee aromas. This flavoring component can be described as cooked cabbage, cheesy, sulfurous, meaty and vegetative. Methyl mercaptan exhibits great enhancing benefits for many savory meat flavors as well as bringing forth the top notes for vegetable flavors. It can also be beneficial in onion and garlic flavors. Its unique ability to add creaminess to formulation makes it a great candidate for coffee flavors as well, especially since it will uplift the coffee aroma while enhancing mouthfeel. Avant Organics provides this material as EU Natural, Kosher, non-GMO and Halal. For your free sample please email info@avantorganics.com.



Hexyl Cinnamic Acid

Natural Advantage, LLC

www.natadv.com

Natural Advantage introduces Natural Hexyl Cinnamic Aldehyde (FEMA 2569; CAS 101-86-0). With a fresh jasmine and gardenia odor, natural Hexyl Cinnamic Aldehyde is a unique product that can be described as sweet, fruity, floral, citrus, green and smooth. The warm and slightly herbaceous undertones that arise with this product make it an essential part of teas. Although it is known for enhancing sweetness and uplifting and amplifying flavors, Hexyl Cinnamic Aldehyde also has a refreshing calming effect that is much desired in tea beverages. This material would work well for honey, fruit, floral and tea. The recommended use levels are 0.5-10ppm. It is EU and US Natural, Kosher, Vegetarian, Non-GMO.



3-Phenylpropyl Cinnamate

Penta International Corp.

www.pentamfg.com

Now offering 3-phenylpropyl cinnamate (FEMA# 2894, CAS# 122-68-9, JECFA# 672). This material is available in both natural and synthetic versions. Contains a flavor base as sweet, spicy, cinnamon-like, balsamic and fruity. Odor notes are sweet, floral, balsamic, spicy and apricot. Our material is Food Grade, Kosher and Halal.



Ysamber K

Symrise AG

www.symrise.com/de/scent-care/aroma-molecules/ingredient-finder/#Ysamber-K

Meet Ysamber K (CAS# 154171-77-4, 154171-76-3), your sustainable, woody companion. As one of the few renewable and biodegradable woody molecules it offers a perfect basis for your creations.

This makes it more relevant than ever. Especially its clean, dry woody and slightly ambery odor profile opens the doors to a multifunctional use.

Images courtesy of the manufacturers





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www.sensientflavorsandextracts.com

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

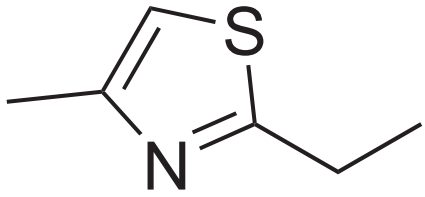


Perilla Herb Oil

Berjé Inc.

www.berjeinc.com/products/essential-oils/perilla-oil/

Berjé's Perilla Herb Oil has a strong and diffusive aroma, with very green and spicy herbal notes somewhat comparable to basil or tea leaf. Perilla herb pairs well with citrus and floral bases such as neroli and ylang-ylang, where it adds a desirable richness and depth to aromatic compositions.

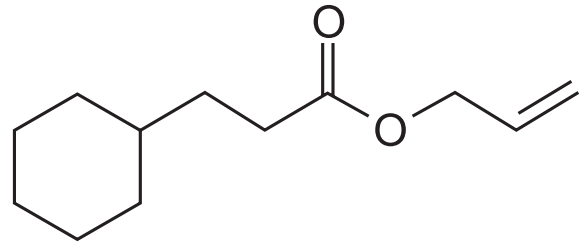


EU Natural 2-Ethyl-4-Methyl Thiazole

Xiamen Bestally Biotechnology

www.bestally.com

EU Natural 2-ethyl-4-methyl thiazole (FEMA# 3680, CAS# 15679-12-6) features taste characteristics at 0.10ppm-0.50 ppm: oily, woody, musty cocoa powdery with a coffee bean nuance. Suggested applications include flavors for dairy, confectionery, desserts, beverages, baked goods, candy, coffee and meat.



Allyl 3-cyclohexylpropionate

Hangzhou Grascent Co., Ltd

www.hangzhougrascent.com

Allyl 3-cyclohexylpropionate (FEMA# 2026, CAS# 2705-87-5) features notes of fruity, pineapple character, which is extremely fresh and natural. Suggested applications include fine fragrance, beauty care, soap, laundry care and household. The recommended use level is 0.1%-2%.

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Scentmate by dsm-firmenich Debuts World's First Edible and Biodegradable Fragrances



Diego Schattenhofer (chef, Taste 1973 Restaurant - Tenerife) , Marichu Fresno (researcher from the Instituto Canario de Investigaciones Agrarias) and Alfonso Álvarez-Prieto (general manager, and founder of Scentmate by dsm-firmenich).

Scentmate[a] by dsm-firmenich has debuted the world's first edible and biodegradable fragrances, said to be inspired by traditional landmarks of the island of Tenerife.

The edible perfumes were created following the partnership between chef Diego Schattenhofer (Taste 1973 Restaurant - Tenerife) and Scentmate by dsm-firmenich. The two perfumes are 100% natural, biodegradable, and formulated with ingredients approved for use in food products.

El Pinar and Medianías de las Islas are the two edible perfumes proposed by the perfumers of Scentmate by dsm-firmenich. Both fragrances feature Emotions fragrance technology, said to allow the design of fragrances that trigger specific feelings linked to certain emotions: energy, happiness, and relaxation, through a study carried out with fMRI (functional magnetic resonance imaging) and a patented process of verbalization of emotions.

Medianías de las Islas is designed to offer an essence that embraces the aromatic variety of Tenerife's fauna and flora, as well as the crops of potatoes, chestnut trees, fruit trees and cereals.

Alfonso Álvarez-Prieto, general manager, and founder of Scentmate by dsm-firmenich, "It is a pleasure to collaborate with a cuisine reference like Diego Schattenhofer and to work with the inspiration offered by a place as evocative as Tenerife".

Marie Hugentobler, creative director and perfumer of Scentmate by dsm-firmenich, in reference to the joint project with Schattenhofer shared, "We have extracted the highest quality ingredients that nature has to offer, to offer bespoke fragrances that evoke deep emotions and capture the essence of each dish."

[a]Scentmate is a registered trademark of dsm-firmenich

Image coutesy of dsm-firmenich

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Azelis Taps Steve Pringle as Managing Director of Vigon International

Azelis announced the appointment of Steve Pringle to the senior management role of managing director of Vigon International, an Azelis company. Pringle will report to Vuk Milojkovic, managing director U.S.

Pringle is said to be responsible for developing and executing a business strategy to deliver sustainable growth in the F&F market in the Americas.

Boasting nearly two decades of experience in F&F, Pringle has been a dedicated member of several industry organizations—having previously served as a board member of the Chemical Sources Association and as well as the *Flavorcon* Advisory Board. Pringle is also recognized as a published author, with numerous articles featured in *Perfumer & Flavorist+*, covering diverse topics from Innovation and Intellectual Property to the Future of Synthetic Ingredients and Natural Materials.

Pringles' former F&F positions include holding the role of Business director for Sensory Ingredients at Renessenz (now Symrise) and later as the vice president of Global Sales & Marketing/president ACS USA at ACS International. His most recent position was vice president of Global Mint and Sensates Group at Takasago International.

Vuk Milojkovic, managing director US, Azelis states, "We are excited to have Steve join Azelis to lead our activities in the US Flavor and Fragrance market as managing director of Vigon. Steve's background includes both significant technical expertise and business development experience. These skills, combined with his time leading technical teams and track record of delivering growth in the F&F space throughout his career, make him an excellent addition for our Vigon team."



Steve Pringle, Ph.D., is said to be responsible for developing and executing a business strategy to deliver sustainable growth in the F&F market in the Americas.

Pringle adds, "Joining Azelis as managing director for Vigon presents a fantastic opportunity to help continue building a leading specialty chemicals brand in one of the most dynamic and complex markets in the world. I look forward to expanding on Vigon's already significant success in the Flavor and Fragrance market."



Image coutesy of Azelis

Louis Vuitton Debuts A Perfume Atlas Exploring the Craft of the Perfumer

Louis Vuitton has announced the forthcoming book, *Louis Vuitton: A Perfume Atlas*, illustrated by Aurore de la Morinerie and photographed by Sébastien Zanella.

Below is the book's description on the Thames & Hudson USA website:

Louis Vuitton: A Perfume Atlas offers a rare look at the time-honored crafts of the perfumer, with specially commissioned illustrations, photographs, and texts revealing the stories of the precious natural elements that form the basis of the house's unique perfumes.

With exclusive, firsthand access to Louis Vuitton's master perfumer, Jacques Cavallier-Belletrud, this book explores the sources of the raw materials, the techniques used to harvest them, and how essential oils are extracted, distilled, and composed to create new and complex fragrances. From Chinese magnolia and osmanthus to India's tuberose and jasmine, each seed pod, berry, woody stem, fruit, leaf, and flower opens a world that evokes the thrill of far-off places and names, trade routes, sea journeys, and the rhythms of the seasons.



Louis Vuitton: A Perfume Atlas is said to trace the origins of the essences that help create Louis Vuitton's exclusive perfumes.

The book retails for $200 and is available for preorder from Thames & Hudson USA, *https://www.thamesandhudsonusa.com/books/louis-vuitton-a-perfume-atlas-hardcover.* p&f+

Fragrance Creators' President & CEO Farah K. Ahmed Joins *P&F+* Advisory Board

Perfumer & Flavorist+ (*P&F+*) is pleased to welcome Fragrance Creators' president and CEO Farah K. Ahmed to the Advisory Board. Ahmed will be taking the stage at the *World Perfumery Congress* (*WPC*) 2024 to discuss "The Future of Fragrance Stewardship." Stay tuned for the session description as well as a TBA co-speaker to join her on stage. This marks Ahmed's third time taking the *WPC* stage—with the first being at the 2018 Congress in Nice, France.

Ahmed joins fellow F&F industry professionals on the Advisory Board who have agreed to offer their insights on various aspects of flavor and fragrance.

About Farah K. Ahmed

Farah K. Ahmed is the president & CEO of Fragrance Creators Association. Previously, she served as chair, of Strategic Industry Categories, for the Personal Care Products Council, and was appointed convenor of the Cosmetic Marketing Group by the Organization for International Standardization (ISO). She also served as assistant general counsel in the Food and Drug Administration's Office of Chief Counsel. She earned a law degree from the University of Virginia and a Bachelor's Degree in biochemistry from Niagara University. @farahkahmed on Instagram, LinkedIn, and Facebook. p&f+



Farah K. Ahmed is the president & CEO of Fragrance Creators Association.

From top: images coutesy of Louis Vuitton; Peter Wynn Thompson

Renowned Microbiologist Dave Macinga Honored Posthumously with 2024 ACI Distinguished Service Award

The American Cleaning Institute (ACI) has announced the late David Macinga, Ph.D., as the 2024 recipient of the ACI Elva Walker Spillane Distinguished Service Award.

ACI's Distinguished Service Award is named in honor of the late Elva Walker Spillane, the former National Purity LLC chief executive who served on the association's Board for 20 years. The award honors an individual for extensive or exceptional service to ACI, who promoted the growth and interests of the Institute and the industries it represents and who exercised outstanding leadership within ACI.

Macinga served as the vice president of Product Development and Regulatory Affairs, GOJO Industries, until his passing in June 2023. Macinga was an integral leader at GOJO from 2003 to 2023, developing new and innovative antimicrobial and antiviral skin and surface hygiene products. He was widely published since 1995 in antimicrobial resistance and hand hygiene. Before GOJO, Dave worked at Procter & Gamble and Schering-Plough Research Institute.

This posthumous honor is for Macinga's many years of outstanding service to the ACI and the cleaning products industry. Macinga was actively engaged at ACI in a range of areas, especially the topical antiseptics program, where he provided invaluable expertise and insights as part of ACI's extensive efforts to protect public health and safety and preserve the marketplace for these products and chemistries.

In addition to his active engagement in ACI's antiseptics research program, he provided leadership and strategic thinking on behalf of the industry. He was a key voice in discussions with the Food and Drug Administration (FDA).



"Dave Macinga was an outstanding leader, collaborator, colleague and friend," said Melissa Hockstad, ACI president and CEO. Image courtesy of ACI.

Over the years, Dave was also an active participant in ACI's Research, Technology, and Regulation Committee, Disinfectants Tiger Team, Microbial Cleaning Products Task Force and various regulatory and government affairs initiatives. He was also a founding member of the Future Leaders, serving as its first Board treasurer.

"Dave Macinga was an outstanding leader, collaborator, colleague and friend," said Melissa Hockstad, ACI president and CEO. "Most importantly, he was a beloved husband and father and is sorely missed by so many. We are proud to honor Dave's contributions to ACI and the industry at-large."



Image coutesy of ACI

4 Strategies to Navigate the Global Orange Juice Shortage



Citrus greening and a decline in output result in reduced availability and increased prices, posing a substantial challenge to the industry.

Currently, the beverage industry is suffering from a crisis in orange juice supply. Orange Juice NFC (Not From Concentrate) or FCOJ (Frozen Concentrated Orange Juice) is a key ingredient in an array of formulations.

Agrumaria Reggina discusses the factors behind the crisis and how to move forward.

Factors Contributing to OJ Crisis

Several factors contribute to this crisis, primarily originating from the Americas:

- Citrus greening, a severe disease affecting orange groves, has led to a noticeable reduction in orange juice volumes.
- Certain countries historically significant in producing Natural Orange Juice have seen a decline in output, causing a shift in South American producers towards Natural Orange Juice at the expense of FCOJ.

These factors result in reduced availability and increased prices, posing a substantial challenge to the industry.

4 Strategies for Addressing the Crisis

1. **Geographical Diversification:** Learning from the COVID-19 pandemic, it's clear that over-reliance on specific regions for essential goods like FCOJ is risky. Europe, and notably Italy, offers a vital alternative supply source.

2. **Product Analysis and Adaptation:** It's essential to assess where orange juice is used in your product range. While 100% orange juices face a tougher challenge due to consumer expectations, in drinks and nectars, replacing a portion of orange juice with other fruit juices or contents is a viable option.

3. **Innovative Formulations:** Shifting from 'orange juice' to 'orange juice and fruit' can be a strategic move. Utilizing fruit extracts and pulps not only addresses volume challenges but also reduces costs, offering a more favorable cost per liter.

4. **Utilization of Restoration Aromas:** These aromas, extracted from the FCOJ production process, help maintain a high aromatic profile with less juice content. Being derived directly from the fruit, they don't require labeling, thus keeping ingredient lists short and clean.

p&f+

Image coutesy of Agrumaria Reggina.

Givaudan CEO Gilles Andrier to Receive TFF Hall of Fame Award

Givaudan announced its chief executive officer (CEO), Gilles Andrier, will receive the prestigious Hall of Fame Award from The Fragrance Foundation (TFF) at the 2024 Fragrance Foundation Awards held in New York City on June 5, 2024.

The annual fragrance awards recognize and celebrate extraordinary individuals, innovations, and achievements within the United States fragrance industry.

Andrier began his 30-plus year career at Givaudan in 1993, serving in a number of key roles including head of Fragrances Operations, USA, Head of Consumer Products, Europe, Head of Fine Fragrances, Europe and Global Head of Fine Fragrances until he was appointed as CEO in 2005. Under his storied tenure, Givaudan has grown significantly where he has led the Company's global expansion and redefined the Company's strategic direction making Givaudan a global leader in Fragrance & Beauty and Taste & Wellbeing. His leadership has left an indelible mark in the fragrance industry. Givaudan's rich history emanates from the combination of cultures and capabilities of some of the world's greatest fragrance houses, including Roure, Chiris and Quest International. With strategic acquisitions, Andrier elevated Givaudan to unprecedented heights within the fine fragrance market. Under his guidance, Givaudan saw unparalleled global expansion and solidified its fine fragrance market leadership, supporting customers in creating iconic fragrance brands that consumers love.

"On behalf of Givaudan, I am incredibly honoured and humbled to be recognised by The Fragrance Foundation with the 2024 Hall of Fame Award. This award pays tribute to everyone at Givaudan for their creativity, passion and contribution to our wonderful fine fragrance industry," said Gilles Andrier, chief executive officer of Givaudan.

"Being part of this beautiful industry, one of artistry and craftsmanship coupled with innovation, has profoundly impacted my life. The power of fragrances to evoke emotions, to stir memories and to bring joy to people's lives is an enduring contribution that we can all be proud of."



Gilles Andrier will receive the prestigious Hall of Fame Award from TFF at the 2024 Fragrance Foundation Awards on June 5, 2024.

"Gilles Andrier is an exemplary purpose-driven leader whose strategic vision and passion for the fragrance industry is evident in everything he does and how he leads. Our shared values and vision for the world of fragrance puts the people, products and perfumers at the centre," said Linda G. Levy, president of The Fragrance Foundation. "He has been at the forefront of driving sustainability and DEI initiatives within his organisation, building community and bridging business goals with love for nature. We are extremely proud to bestow this honour in recognition of Givaudan's heritage and to Gilles' legacy."

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Image coutesy of Givaudan

LUZI Discusses Family Legacy & The Next Generation

Discover LUZI company strides, corporate updates and partnership goals.

SPONSORED BY LUZI AG



Since 2010, LUZI has continuously invested in new talents, the optimization of its business model and has aggressively internationalized, opening seven sales offices across four continents, a production facility in Malaysia and a creative lab in Paris.

LUZI, a swiss-based and family-owned perfume house, continues to spread its reach nearly 100 years after its founding in 1926. Most recently, LUZI moved into a new state-of-the-art and highly sustainable building on an 11,000-square-meter site in Dietlikon, Zurich, and announced a change in key management positions.

Perfumer & Flavorist+ connected with CEO Roland Altenburger (third generation), to reflect on the company's nearly century-long legacy, share recent corporate changes and give an inside look at partnering with LUZI.

LUZI is just two years away from celebrating its 100th anniversary–what an impressive milestone! Can you touch on how the company has evolved over the years?

Roland Altenburger [RA]: LUZI was established in 1926 in Zurich by Mr. Hermann Luzi and later handed over to my grandfather in 1952. The company's first major breakthrough came in the late 1960s with the creation of the fragrance for the brand "Fenjal," initially a pioneering bath oil in Europe at that time. Early on, due to the small size of the Swiss market, LUZI expanded overseas, notably entering the GCC in 1968 as one of the first European fragrance houses to do so.

Since 2010, LUZI has significantly grown, also through its further internationalization, opening seven sales offices across four continents, a production facility in Malaysia and a creative lab in Paris. Meanwhile the company has refined its business model and continuously invested in new talents. These efforts have led to a significant organic annual growth of over 20% over the last three years.

Images courtesy of LUZI

LUZI announces updates to a few key corporate positions. How do these promotions echo the core values of the company?

RA: The current promotions within LUZI reflect our steadfast commitment to the core values that have guided us for nearly a century, with long-term partnership standing out as a fundamental principle. This value is not only pivotal in our relationships with customers and suppliers but is equally significant within our team.

Under the leadership of CEO Jürg Koller for the last 25 years, LUZI has experienced remarkable growth, with sales increasing from 17 million CHF in 1998 ($12 million) to 110 million CHF in 2023 ($120 million). Jürg has been instrumental in driving our international expansion and enhancing our global market position while upholding our core company values.



L to R: LUZI's corporate team updates include Marc Vogel (COO), Roland Altenburger (CEO) and Christoph Heil (Head of Sales).

As Jürg passes on the position of CEO to me, once again this important role is in the hands of an Altenburger family member. Also, the transitions are a testament to the value we place on continuity and internal growth: Marc Vogel, stepping into the role of COO after more than 20 years with LUZI, embodies the dedication and leadership that have been crucial to our success. His extensive experience and deep understanding of our business model and market dynamics make him an ideal choice for this role.

Similarly, Christoph Heil's promotion to Head of Sales reflects of our belief in nurturing talent from within. Christoph's background with industry giants like Firmenich and IFF, combined with his successful tenure as Regional Sales Director Europe at LUZI, positions him perfectly to lead our sales strategy forward.

Together, Marc and Christoph represent the kind of empathetic, charismatic leadership that resonates with our values. Their unwavering commitment to the success of our team and the broader LUZI family underscores the essence of partnership that Jürg has championed throughout his tenure.

Could you share a few examples of how LUZI differentiates itself?

RA: Thanks to the structure of our organization, the flat hierarchy, and the family-ownership we are very agile in decision making, assuring a high degree of flexibility that is much appreciated by our customers. Simultaneously, our core value of long-term partnership in combination with our Swiss quality seal, ensures a high level of commitment, reliability, and consistency as a solid basis of a sustainable business.

Another key pillar of our success is the creativity that is embedded in our company vision "Creativity touching your senses." The belief in this vision enables the conception and development of exceptional fragrance creations that are not only unique but also appeal to a broad spectrum of consumers.

What is fascinating is the result of the combination of our long-standing perfumers, who have extensive knowledge of Middle Eastern perfumery and at the same time in the European mass market, with the experts in the Western niche and prestige segment who joined us just a few years ago. This fusion of different perfumery philosophies, practices and expertise fosters a highly inspiring and creative environment.

What can a company expect when they begin a partnership with LUZI?

RA: We are convinced that mutual trust is the main factor of success within a rapidly changing and demanding marketplace. Reliability is key to jointly manage those challenges. Therefore, our potential customers can expect a superior service quality provided by our experienced team of industry experts, a high level of transparency, a comprehensive olfactive and conceptional support as well as most importantly an outstanding and consistent fragrance quality. Moreover, our company places a strong focus on the continuous optimization of sustainability performance within our industry.

PROFILE:
LUKE J.W. HAFFENDEN, PH.D.

The chief flavorist also shares advice for up-and-coming flavorists, how the job has evolved and more.



Name: Luke J.W. Haffenden, Ph.D.

Position: Chief Flavorist

Company: Mosaic Flavors

Current location: Montreal, Québec

What led you to the flavor industry?

Growing up, the flavor industry was my backdrop and playground. As a young child, I accompanied my father, the late John D. Haffenden, on sales visits for several flavor houses and joined in dinners with clients and their families. This early exposure paved the way for my involvement in two family-operated flavor houses, where I had the chance to observe, learn, and contribute across various departments. My commitment to this path was tested during my chemistry studies, leading me to explore other avenues through lab work. Yet, it became clear that my passion for flavors was undeniable. I was drawn to the unique blend of science and art it represented, realizing it was where my true interests lay.

What applications do you primarily formulate for? Has this changed since you first began your career?

My career in the food and beverage industry has always centered on the innovative application of flavors, a path significantly shaped by mentors who championed boundless exploration. Starting in flavor houses before co-owning and leading an R&D department, I've focused on marrying the art and science of flavor to enhance consumer products across beverages, processed foods, confectionery, and dairy.

This journey has been about pushing boundaries, driven by a commitment to innovation and excellence. Working collaboratively with food scientists and product developers, we've navigated the complexities of flavor appeal and regulatory compliance, constantly seeking creative solutions to meet consumer expectations and trends.

Technological advancements have been pivotal, enabling us to explore new flavor applications and meet the evolving dietary needs of a global audience. My work aims to leverage these innovations, ensuring flavors not only comply with regulations but also captivate the consumer's palate.

What are some of the current trends that are exciting you at the moment?

The trend that captivates me most is the emergence of multisensory flavor experiences. There's a growing realization that the conventional flavor experience, rooted in taste and smell, can be profoundly enriched or altered through additional sensory inputs. While this insight has long been a staple among food and beverage product developers, sensory scientists, and marketers, it's now gaining traction in restaurants, clubs, events, bars, and during product launches. We inhabit a world rich in multisensory experiences, yet seldom do we engage more than two senses at any given moment.

Similarly, the allure of internationally inspired flavors holds significant interest for me. Each culture and

Image courtesy of Mosaic Flavors

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country on our diverse planet harbors unique flavors awaiting discovery. These distinct tastes offer invaluable insights into the vast palette of global cuisine, underscoring the importance of exploring and integrating these flavors into broader culinary practices.

Are there any formulations you would consider timeless? Why?

Timeless flavors are those that have maintained their appeal across generations and cultures, integral to both traditional and modern cuisines worldwide.

Vanilla, with its sweet, comforting aroma, and chocolate, known for its rich indulgence, are staples in desserts. Citrus fruits like lemon, lime, and orange bring a refreshing tang to both sweet and savory dishes. Cinnamon, with its warm, spicy sweetness, and garlic, valued for its aromatic depth, are key in a variety of recipes. Ginger, offering zesty warmth, and mint, known for its cooling freshness, enhance dishes ranging from beverages to savory meals. The fundamental seasoning of pepper, in its black, white, and red varieties, adds essential heat and complexity. Honey, a natural sweetener with a rich, floral taste, has been cherished for centuries for both its flavor and nutritional benefits. Lastly, the tomato, with its balance of sweetness and acidity, proves versatile in countless culinary applications.

These flavors have transcended trends, embodying the essence of culinary tradition and innovation, and continue to be celebrated for their versatility and enduring popularity in kitchens around the globe.

Advice for people coming into the flavor field?

I recommend staying informed about the current state of the industry and anticipating its future direction. Like many sectors, the flavor and fragrance industry will undergo rapid transformations due to advancements in technology, including automation and artificial intelligence. These innovations promise to expedite changes and deepen our comprehension of various processes.

Beginning your career in a flavor house offers a vibrant and dynamic environment, serving as an excellent springboard into various roles within food and beverage companies. My advice? Dive in and embrace the opportunities this field provides. Even a few years of experience in flavors can open numerous doors, broadening your career prospects significantly.

Are the types of projects you're working on changing over time? How are the creative demands of the job evolving?

The landscape of flavor development has seen a marked rise in projects centered around nutraceutical, cannabis, and vegan applications. Yet, this innovation is paralleled by a tightening in regulatory standards and client-imposed restrictions. These measures, while aimed at ensuring safety and compliance, have become more stringent over time, affecting the creative process, influencing the cost of flavors, and adding complexity to business operations. This environment demands that flavorists expand their creative horizons, even as they work with limited resources.

Contrastingly, the current era's rapid pace, fueled by connectivity and social media, has spurred consumers and product developers to seek out new flavor trends. The demand for flavors with international inspiration, limited-time offers, and special editions exemplifies this trend. Such projects inject a dose of excitement into the work, as they typically require a high degree of creativity. Despite the surge in trendy flavors, it's likely that the preference for classic, lower-risk flavors like vanilla, chocolate, and strawberry—those with widespread acceptance—will persist. These enduring favorites continue to dominate over more fleeting taste trends.

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PROFILE: GABRIELA CHELARIU

The principal perfumer shares their journey to fragrance and their experiences during tenure.

What led you to the fragrance industry?

I spent my childhood and teenage years in a small town in Romania, and more than half of that time in a political regime that was very restrictive and did not allow almost any influx of any kind from outside, including fragrances. Despite this, my life was permanently punctuated by scents, not from bottles, but from nature. My grandmother was a big influence in cultivating in me the knowledge and love of plants and what nature can offer us and from a young age I could identify the scents of all the plants around me, whether flowers, herbs, vegetables, or spices. Scent was so vital in my life, that I had olfactory cues for seasons, even months of the year, recurring celebrations, places, and people; scent was one of my closest guides in my life.

Against this backdrop, in the last year of studying to be a pharmacist, by some fortunate circumstance, I had the amazing chance to work in research for aroma chemicals used in fragrance creation. I can proudly say that my lab was by far the best smelling around—coconut, jasmine, orange blossom. It seemed extraordinary that from not-so-good-smelling sludge such wonderful smells should emerge. This is how my journey in perfumery started. But to get where I am today, I am profoundly thankful to the wonderful and generous mentors and collaborators I had along the way, be they perfumers, fragrance developers, brand creators, and so on.

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

Throughout my career, I have had opportunities to create for various applications, but today I primarily focus on fine fragrances, occasionally branching out into body products and candles. What I can say is that my creations are translated into a wide range of applications by amazingly talented colleague perfumers with whom I collaborate at dsm-firmenich. I believe that different applications require different expertise, and I am delighted to be part of an organization where collaboration brings forth the best results.



Name: Gabriela Chelariu

Position: Principal Perfumer

Company: dsm-firmenich

Current location: New York City, New York

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

This is always a very difficult question to answer because when I create a fragrance for any project, I dive very deeply into the process. I attach myself emotionally and with both intuitive and analytical faculties, when I successfully secure a project, I feel proud not only of the product but also of the process.

Some recent achievements I am particularly proud of include—Maze for Liberty of London which originated from an accord I created for personal use, blending orange flower, musk and Ambrox Super[a].

[a]Ambrox Super is a trademarked ingredient of dsm-firmenich

Image courtesy of dsm-firmenich

Another fragrance I am proud of is Romance Eau de Parfum Intense for Ralph Lauren which is such an iconic fragrance that introduced a new American signature to the fine fragrance world. Having the chance to continue the journey of this legend was an incredible honor.

Last, another project that was particularly close to my heart was the Kayali Wedding Collection—Silk Santal 36. Creating a fragrance for such a special moment, and capturing emotions in fragrance notes was quite a challenge and privilege.

Describe yourself in three ingredients.

Blackcurrant bud, or cassis, as it's commonly called, would be one as it is an explosive ingredient—multifaceted and full of contradictions. It is tart and sweet, quite aromatic and cooling, with green vegetal and mossy undertones.

Neroli oil offers the most harmonious combination of clean citrus notes, a soft petal effect, and green earthy undertones of green pepper.

Vetiver oil, known for its woody, earthy, smoky, and nutty qualities—I happen to be addicted to peanuts, which we sometimes use to describe vetiver. But another reason I like vetiver is because it reminds me of hiking in the woods. Vetiver evokes the smell of decaying leaves and trees mixed with wet earth.

Now you can draw your conclusions, but one thing I can say is that nature is what inspires me most and where I feel most myself.

Advice for people coming into the perfume field.

I will not mention "passion" first because it sounds cliché, and secondly, if the intention is to become a perfumer, I can't imagine anyone going through the complex and arduous process of becoming a perfumer without having a passion for perfume. So, what I advise people who would like to pursue becoming a perfumer is to be curious, authentic, and resilient. To have courage, patience, and a continuous desire to explore.

One of the most important qualities, however, is generosity. Generosity to bring beauty into people's lives. Fragrances have the power to change people's lives, so we should never take this lightly. It is an amazing privilege, and I am thankful for it.

How has the job of a perfumer changed during your career?

I can certainly say that the job of a perfumer has indeed changed during my career, and I think that's to be expected since we are in a creative field that is linked so directly to the pulse of society. People's expectations change, and so does the advancement of technology, just to mention a few factors.

When I started as a perfumer, we had several major brands of fine fragrances and a limited number of smaller brands, and fragrance launches were at a much slower pace. Today, the landscape is dramatically different. There are thousands of launches per year and a similar number of brands. The speed of launches has accelerated, and the lifespan of a given fragrance is much shorter, often being the brand's intention, as they respond to the expectations of their consumers.



All this said, as perfumers, we need to adapt to this increased pace of creation and be much more aware of the market and consumer trends so we can be very intentional in our creations, offering differentiation and newness. Today, we work more closely with marketing and consumer insight teams, using tools that make some aspects of creation faster so we can focus on innovation.

The growing desire for brands to feature the perfumer in their launches, allowing people to hear about the inspiration, story, and process behind the creation is also something we see more now and this adds another layer to our jobs as creators, and this type of exposure is not always easy as it was not always the case.

Are the types of projects you're working on changing over time? How are the creative demands of the job evolving?

The types of projects I work on are always changing over time. We are in a very innovative industry, and I am continually impressed by the continuous stream of new ways to bring fragrances into people's lives.

One of the recent developments in the fragrance industry is the use of fragrance for wellness. It has long been known that fragrance influences emotions, well-being, and health but as an industry, we have only recently begun to intentionally explore this side of fragrance benefits. What was once considered the domain of aromatherapy is now being integrated into fine fragrance applications, candles, and various other products containing fragrance that touch people in their daily lives.

There is a significant amount of research being conducted at dsm-firmenich to unlock the full potential of fragrance in improving people's well-being, and as a perfumer, I am deeply engaged in the process of creating fragrances that not only bring beauty but also well-being benefits to people's lives. Today, we have technologies developed by the most talented scientists that are integrated into our creation tools, allowing us to make the most informed choices to maximize the signature and performance of our creations.

Therefore, I can confidently say that our creative work now takes a multidimensional and multidisciplinary approach. This represents the future of creation, and I am eager to see how our craft will continue to evolve.

What is the best part of your job?

The best part of my job, besides creating fragrances, is the collaboration with my colleagues inside the company and with partners on the client side. Creation never happens in a vacuum, and collaborating with passionate and amazing fragrance developers internally and on the client side has resulted in amazing fragrances, as well as in trust, respect, and admiration.

I learn a lot from the people I work with, and collaboration is often a source of breakthroughs. Collaborating with fellow perfumers is another amazing aspect of my job, and if I must choose between winning a project on my own or collaborating with a fellow perfumer, I will always choose collaboration. There is nothing like sharing the happiness of successfully completing a project, and it is definitely easier to handle a loss as well.

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Puris Perspectives: Formulating with Buchu Oil

Puris discusses the nuances of buchu oil, the company's evolution and expanded product offerings.

SPONSORED BY PURIS NATURAL AROMA CHEMICALS (PTY) LTD

Over the last two decades, Puris has been known for its buchu essential oils and isolates. Since its founding in 2003, Puris has become a multi-faceted company with a focus on scientific innovation and sustainability. Being that Puris remains a key player in the buchu oil production market, *Perfumer & Flavorist+* connected with Sales & Marketing manager Stefan du Toit to discuss the common misconceptions by industry professionals regarding formulating with buchu oil, the company's evolution and new product developments.



Puris' sourcing strategy involves acquiring buchu plant material from diverse regional farmers and meticulously identifying chemotypes. Photo credit: GIZ/ABioSA/Jonathon Rees

Puris celebrated its 21st anniversary this year, can you share about the company's evolution in the industry?

Stefan du Toit [ST]: Our journey started in 2003 with buchu oil, extracted from the herbaceous Agathosma species, which is part of the Fynbos kingdom that is endemic to the Western Cape of South Africa. Leveraging our expertise in mild-separation techniques, we have added further value to the process with the production of Buchu Sulphur Fractions and other isolates. Subsequently, this proficiency expanded to encompass citrus oils and natural aroma chemicals.

What makes Puris' buchu oil unique to what is currently on the market?

ST: Our sourcing strategy involves acquiring buchu plant material from diverse regional farmers and meticulously identifying chemotypes. This enables us to furnish tailored specifications that align precisely with the chemical composition and sensory attributes of any specification and offer product consistency on a level that is expected by the most demanding end-users.

Similarly, as the sole at-source producer supplying Buchu Sulphur Fractions, each specification is tailored to your unique requirements.

Additionally, as pioneers in buchu oil production, we have established a Benefits Sharing Agreement, aligning with Nagoya principles, and have been remitting royalties to indigenous knowledge holders (San & Khoi) since 2019.

What would you say are some of the common misconceptions perfumers and flavorists have regarding formulating with buchu oil?

ST: A common misconception pertains to the belief that only two types of buchu oils exist, derived from *Agothosma betulina* and *crenulata* species. However, multiple Betulina chemotypes, including naturally occurring hybrids, have been identified. Each chemotype exhibits unique traits contingent upon its regional habitat, such as high-isomenthone betulina in the Piketberg mountains and high-Diosphenol betulina in the Citrusdal mountains, resulting in distinct organoleptic profiles.

Yes, Puris is known for its buchu oil production, but could you share some product offerings or services the company has in its portfolio that the industry may not be as familiar with?

ST: Innovation remains integral to Puris' ethos, leading us to explore novel technologies and products, including ventures into biotechnology. Our inaugural biotech-derived product, EU Natural Sotolone (Fenugreek Lactone), stands as a testament to this commitment. Additionally, our portfolio includes citrus oils & fractions and processed Fusel oil products.

What does the future look like for Puris? Any current projects you can share that will be brought to market in the near future?

ST: We are currently pioneering another groundbreaking product for South Africa, Orris Butter ex-Iris Pallida, employing innovative techniques to expedite the aging process of the Iris rhizomes. We are extremely excited for our first harvest this year.

For more information, please contact Info@puris.co.za.

Images courtesy of Puris



trans-*2-Dodecenal forms a key part of cilantro flavors, adding depth and authenticity at around 1,000 ppm.*



BY JOHN WRIGHT
johnwrightflavorist@gmail.com

FLAVOR BITES: *trans*-2-Dodecenal

A jack of all trades, *trans*-2-dodecenal works in a number of roles by itself as well as with a partner.

trans-2-Dodecenal (FEMA# 402, CAS# 20407-84-5) forms a key part of cilantro flavors. It is usually the second ingredient, after *trans*-2-decenal, which is even more strongly characteristic of fresh coriander leaves. It also performs a number of other very different, but equally useful roles. In savory flavors, where there is an aspect of cooked or fried oil, it helps to build an attractive fried note. It reduces the reliance on 2,4-decadienal, which can easily introduce an unpleasantly oxidized nuance. In citrus flavors, *trans*-2-dodecenal can lift all categories, but it is especially good in mandarin and tangerine profiles. The final role is much more subtle but, at a low level, it adds an attractive skin note to fruit flavors.

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 a simple bouillon.

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Savory Flavors

Bacon: Cooked fat is a key aspect of bacon flavors. *trans*-2-Dodecenal enhances this character and reduces the reliance on 2,4-decadienal. Twenty ppm is a good starting level in fried bacon flavors.

Beef, Roast: The effect in roast beef flavors is quite similar, but the level is lower, around 10 ppm.

Chicken: The level in chicken flavors depends totally on the style of flavor. It is obviously highest in fried chicken, where 80 ppm is not excessive.

Cilantro: *trans*- 2-Dodecenal forms a neat partnership with *trans*-2-decenal in cilantro flavors, adding depth and authenticity at around 1,000 ppm.

Garlic, Fried: This raw material forms part of an attractive "fried" combination in fried garlic flavors at around 200 ppm.

Grill: Grill flavors are different, but the effect of *trans*-2-dodecenal is similar to that in fried flavors. Two hundred ppm is a good level.

Onion, Fried: Fried onion flavors are similar to fried garlic flavors, but a little more restrained. One hundred ppm works well.

Pizza Crust: Bread flavors, especially pizza crust flavors benefit from the addition of *trans*-2-dodecenal at levels in the region of 50 ppm.

Potato, Fried: Fried, French fried and sauteed potatoes just need a moderate fried note. *trans*-2-Dodecenal plays a great role, adding complexity and depth at around 50 ppm.

Seafood: Seafood flavors, especially lobster and shrimp, only need a hint of fried note. Twenty ppm is a good place to start.



trans-*2-Dodecenal is obviously highest in fried chicken, where 80 ppm is not excessive.*

Smoke: The same could obviously be said of smoke flavors, but *trans*-2-dodecenal adds complexity and realism at 20 ppm.

Soy Sauce: Soy sauce flavors are also not obviously fried in profile, but this ingredient still adds depth and authenticity at 20 ppm.

Citrus Flavors

Clementine and Tangerine: *trans*-2-Dodecenal is a perfect ingredient for clementine and tangerine flavors, lifting them out of the ordinary. Although the obvious note is cilantro, it shades strongly towards the citrus note of the sinensals. Levels vary, but 25 ppm is a good starting point

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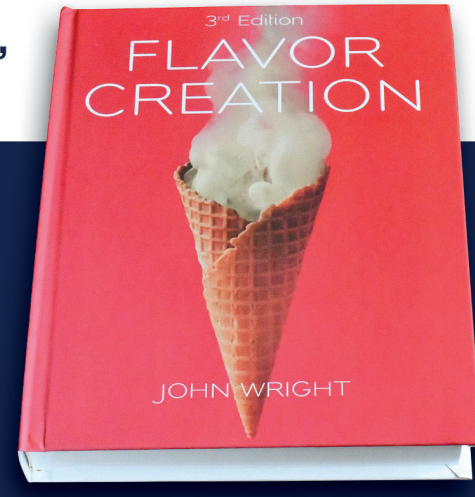


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Grapefruit: Many grapefruit flavors already have too much in common with orange flavors, so this raw material needs to be used with more caution. Start at 10 ppm to 15 ppm.

Kalamansi: Kalamansi flavors are the best use of *trans*-2-dodecenal within the citrus category. One hundred ppm works perfectly.

Mandarin: Slightly lower levels work well in Mandarin flavors, around 60 ppm, depending on the level of dimethyl anthranilate.

Orange, Bitter: *trans*-2-dodecenal pairs well with the floral notes in bitter orange flavors. Levels vary, but 30 ppm is generally reasonable.

Orange, Sweet: High levels of *trans*-2-dodecenal can push orange flavors distinctly in the direction of tangerine. This may often be a good thing, in which case use levels around 20 ppm. If a tangerine note is to be avoided, 10 ppm works well.

Yuzu: Yuzu flavors are tricky to create, in part because the natural fruit is so scarce. Thirty ppm of *trans*-2-dodecenal is always beneficial.



Fried onion flavors are similar to fried garlic flavors, but a little more restrained. One hundred ppm works well.

Other Fruit Flavors

Apple: Levels in non-citrus fruit flavors are quite difficult to get right, and it is best to start cautiously. As little as 2 ppm enhances the skin notes in apple flavors.

Apricot and Peach: The same 2 ppm level has a similar effect in apricot and peach flavors. It does not affect the "furry" aspect of the skin note, but it does work in a more general sense.

Blueberry: The level in blueberry flavors varies wildly. Two ppm, once again, works well in very traditional flavors, but much higher levels are very interesting in wild blueberry flavors.

Cranberry: Higher levels can also be tried, cautiously, in cranberry flavors, significantly enhancing the skin notes.

Grape, Concord: The same comments also apply to Concord grape flavors, with levels up to 10 ppm working well.

Dairy Flavors

Butter: This ingredient might seem a little unlikely in the context of dairy flavors, but it adds a little edge of sharpness to contrast with the dominant sweet and creamy notes. Five ppm works well in fresh butter flavors.

Cheese: The same effect, and the same 5 ppm level, are effective in all categories of cheese flavors, especially blue cheese flavors.

Cream and Fresh Milk: Levels of *trans*-2-dodecenal around 5 ppm are also ideal in fresh milk and fresh cream flavors, perhaps edging a little higher if there is a faint hint of sourness to a cream flavor.

Milk, Condensed: The one exception in his category is condensed milk flavors. Levels vary, but can certainly be edged higher in more assertive profiles.

Other Flavors

Cocoa: There is a dry edge to good cocoa which can be difficult to capture in a flavor. Five ppm of *trans*-2-dodecenal is distinctly helpful.

Corn, Toasted: Toasted corn flavors come in different styles, depending on the intended end product, corn flakes or chips. Fifty ppm of *trans*-2-dodecenal adds an interesting edge in both instances.

Ginger: Most ginger flavors rely mainly on natural ginger oils and oleoresins. Fifteen ppm of this raw material lifts the profile and adds a subtle hint of citrus.

Peanut: *trans*-2-Dodecenal can be used in all nut flavors, helping to offset some of the fatty and roasted ingredients. It is most effective in peanut flavors at around 10 ppm.

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AMERICAN CLEANING INSTITUTE 2024 CONVENTION HIGHLIGHTS AI AND SUSTAINABILITY

Take a look at innovations from dsm-firmenich, Givaudan and Sensegen showcased at this year's ACI Convention in Orlando, Florida.

BY JENNA TROYLI, managing editor, *Perfumer & Flavorist+*



Future of Cleaning: AI & the Cleaning Products Industry featuring Hogan Lovells' Lauren Cury (middle) and Noble AI's Ethan Mirsky(R), moderated by Corey Brooks Pace (L).

Photo by Jenna Troyli

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2024 marked a record year for the American Cleaning Institute (ACI)'s Annual Convention, hosting 1,300 attendees at the Grande Lakes Orlando. In 2026, the location for the convention will be housed at the Marriott World nearby.

This year was *Perfumer & Flavorist+*'s first time attending the ACI Annual Convention! Below are some of the highlights from the conference stage to the individual company displays to the Duck Race.

Conference

On January 31, I attended the Novel & Green Chemistry Innovation Showcase, during which, a familiar face, Sensegen VP of Fragrance and senior perfumer, Angélique Burke, took the podium to discuss a laundry bar soap created in collaboration with Bradford Soap that was shared within the ACI gift bags. According to Sensegen, the collaboration came about by Burke sharing with Bradford that Sensegen was launching the 100% biotech fragrance at ACI. Bradford wanted to support Sensegen's campaign, so they created 2500 sample laundry bar soaps.

On February 1, the ACI conference hosted a fireside chat discussion Future of Cleaning: AI & the Cleaning Products Industry featuring Hogan Lovells' Lauren Cury and Noble AI's Ethan Mirsky, moderated by Corey Brooks Pace (pictured at the top of this article). The trio discussed the nuances of utilizing artificial intelligence (AI) to formulate for cleaning products or to gather information. How is intellectual property protected if a company has used AI? What about patents? More coverage on this session can be found on *perfumerflavorist.com*.



The collaboration between Bradford and Sensegen shared at the ACI Annual Convention.

Product & Tech Displays

During the convention, I was invited to explore dsm-firmenich's Sensorium. I was walked through the multi-faceted immersive experience by perfumer Sabine de Tscharner who broke down the capabilities of dsm-firmenich's lineup of innovative fragrance technologies including Haloscent, Popscent and explained the influence of the company's EcoScent Compass.

- PopScent is designed to utilize a core-shell polymeric capsules containing fragrances that are deposited and retained on surfaces such as clothes, skin and hair during product use. Upon drying, the capsules are said to become brittle and break (due to naturally occurring physical forces, such



Sensegen VP of Fragrance and senior perfumer, Angélique Burke.

Photos by Jenna Troyli

as movement, rubbing, combing, etc.), releasing the fragrance. de Tscharner also discussion the reinvented PopScent range which features a "new generation" of freshness with PopScent EcoMax, utilizing the company's first capsule made exclusively with 100% biodegradable ingredients.

- In terms of Haloscent, I was able to experience the new generation of biodegradable profragrances that is said to deliver a new experience by releasing not only one, but two perfume molecules over time, creating a halo effect designed to enable the entire fragrance to last longer for a more rounded olfactive experience.

I was also invited to Givaudan's "home," where the company showcased its line of home care, personal care and laundry care ingredient technologies inspired by #CleanTok (A TikTok phrase that users search in order to find a list of videos for deep cleaning inspiration, tips, and before-and-after clips.)

The head screen in the Givaudan House read, "A clean space promotes mental clarity and well-being, backed by a portfolio of well-being technologies."

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



dsm-firmenich perfumer Sabine de Tscharner touring the Sensorium at the ACI Annual Convention 2024.

Duck Race

The Charity Duck Race commenced in Lazy River at Grande Lakes, sponsored by Shell Chemical LP. Each company decorated their racing duck to "race" along the Lazy River to raise money for the charity The WASH Foundation, an evolution of Clean the World Foundation.

The WASH Foundation is a leader in global health, recycling discarded hygiene products and distributing them to communities in distress around the world.

"We are proud to highlight and support the mission and efforts of The WASH Foundation," said Melissa Hockstad, ACI president and CEO. "ACI, our member companies and Shell Chemical LP place a high priority on programs and partnerships that help provide better living for individuals, families and communities."

Together, ACI's members were able to donate $40,575 to The WASH Foundation.

Charity Duck Race Winners:

- 1st place: ExxonMobil Product Solutions
- 2nd place: Future Origins
- 3rd place: Brenntag
- People's Choice: Colgate-Palmolive

I look forward to making my way back for the 2025 edition of the ACI Convention to dig into the latest fragrance technologies the cleaning space has to offer as well as cheering on the creatively decorated ducks for a good cause.



The Charity Duck Race commenced in Lazy River at Grande Lakes, sponsored by Shell Chemical LP.

From top: Image courtesy of dsm-firmenich; photo by Jenna Troyli

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Guarana is a rich source of methylxanthine, which is responsible for its stimulating and cognitive effects, as well as polyphenols such as tannins, catechins, epicatechins and procyanidins B1 and B2.

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BY MARIE WRIGHT, president of Creation, Design and Development and chief global flavorist, ADM



Marie Wright

From ancient civilizations to modern-day consumers, people have drawn connections between specific plants and how those botanicals influence the way they feel. Today, the food industry relies on flavors, colors, aromas and more to cue emotional and physical responses from consumers, be it mental clarity, nostalgic comfort or indulgence. With a deep understanding of the various attributes that align with different taste profiles, flavorists can leverage natural extracts–from guarana to ginger and more–to bring forth new innovation opportunities that will delight the senses.

Guarana *(Paullinia cupana (Sapindaceae))*

As one of the richest natural sources of caffeine, guarana extract is a prized ingredient in energy drinks and many other beverages. The plant is native to the Amazon basin and is especially common in Brazil, where an incredibly popular soft drink is named after



Yerba mate is indigenous to Paraguay, Argentina, Brazil, Chile and Uruguay. It has been consumed for centuries as a tea infusion that is traditionally prepared in a dried gourd.

From top: Image courtesy of ADM; image by René Stevens at Adobe Stock

the fruit. The uniquely flavored soft drink brings sharp apple, pineapple and berry notes with citrus undertones. However, the true taste profile of guarana extract is an intense bitterness–like an ultra-dark chocolate bar–with nutty, woody, malty and vegetative notes. This distinction is an interesting example of consumer perceptions of "authenticity." Today's shoppers are seeking out sensory experiences that are authentic to their memories and past experiences. So, the refreshing fruit flavors of Brazil's favorite soft drink may seem more accurate to some than the bitter, astringent taste of guarana extract.

Guarana extract production is labor intensive, as the reddish-orange berries must be harvested manually. The ripe berries partially open to reveal white arils that contain dark black seeds. When the seeds are first extracted, they have a floral note reminiscent of nerolidol (lavender, lily, cedar). The seeds are then concentrated and used as a liquid or dried to a powder. The powders can vary in color, usually shades of light to dark brown. In Brazil, guarana extract must contain at least 1.2% caffeine to comply with beverage legislation. Guarana is a rich source of methylxanthine, which is responsible for its stimulating and cognitive effects, as well as polyphenols such as tannins, catechins, epicatechins and procyanidins B1 and B2.[1,2]

Yerba mate *(Ilex paraguariensis (Aquifoliaceae))*

The bioactive properties of yerba mate are key to its association with wellness, including its antioxidant and stimulating effects. Consumers continue to be proactive about their health and well-being and, at this point, functionality is a baseline expectation for many foods and beverages. Flavorists and formulators can use yerba mate to elevate teas, as well as sparkling beverages, and support consumers in their quest to proudly showcase their healthy lifestyles through wellness purchases. The phytochemicals within yerba mate include polyphenolic acids (such as chlorogenic acid), alkaloids (methylxanthines such as caffeine and theobromine) and terpenes (like carotenoids and saponins) in addition to minerals and vitamins.

Yerba mate is indigenous to Paraguay, Argentina, Brazil, Chile and Uruguay. It has been consumed for centuries as a tea infusion that is traditionally prepared in a dried gourd. The leaves are blanched, dried and aged, and sometimes dried over wood smoke. Dried leaves are used to make the tea infusion and the extract. Yerba mate has a very distinctive and complex flavor profile. It is bitter, herbaceous, vegetative, often smoky, woody, floral, peppery and even tobacco-like. While plain yerba mate is an acquired taste, it is frequently combined with fruit flavors, like blackberry, peach, grapefruit, lemon, orange or watermelon. Additionally, yerba mate extracts are often incorporated into other types of tea.



Gingerol activates heat receptors on the tongue and is added through an oleoresin.

Ginger *(Zingiber officinale (Zingiberaceae))*

Ginger is a common spice consumed worldwide that finds prominence as an excellent "flavor mingler." Its profile is complex, so the qualities of ginger oils and extracts vary considerably. Some have pronounced fresh lemon, melon and rose notes, some are more herbal, medicinal and earthy, while others are roasted and nutty. Combinations of ginger with lemon, mango, pear and honey are often featured in foods, teas and other beverages.

Ginger is also known to bring heat. Gingerol activates heat receptors on the tongue and is added through an oleoresin. Major components of ginger oil are zingiberene and ar-curcumene, which contribute peppery, spicy notes. The hot, pungent flavor is an integral element in many Asian cuisines. With the versatility to pair with umami, sour and sweet flavors, spicy ginger applications span curries and kimchi, meat and seafood dishes, fruit preserves, candies, baked goods and numerous beverage formats. Flavorists can leverage ginger to bring new heights of culinary excitement to consumers thirsting for sensorial exploration.

The perceived wellness benefits of ginger are another element of its appeal. Phenolic compounds, including gingerols, shogaols and paradols are associated by consumers with anti-inflammatory activity and gastrointestinal digestive efficiency. Thus, ginger can offer cues of digestive health as another pathway to overall well-being.

Image by Vector Nazmul at Adobe Stock

Coconut *(Cocos nucifera (Arecaceae))*

Coconut water has long been a popular drink in tropical regions, and now it is often associated with active nutrition. As a natural source of electrolytes like potassium, sodium, calcium and manganese, coconut water is a refreshing way to aid hydration and replenish the body after physical activity. To some, coconut is the essence of summer. Flavor pairings with pineapple, lychee, banana and mango evoke beach vacations, and juicy citrus fruits are as bright as sunshine. On top of that, coconut offers complexity and a depth of flavor as varied as sweet, fresh, nutty, toasted, creamy and/or milky notes. Because the taste of coconut is so distinct, it is difficult to replicate authentically without using a quality extract.



Concentrated coconut extracts can also contribute a rich mouthfeel for a multisensorial experience.

Concentrated coconut extracts can also contribute a rich mouthfeel for a multisensorial experience. Many consumers are embracing luxuriously indulgent flavors to satisfy their tastebuds and soothe their emotions. Coconut pairs beautifully with sophisticated flavors of vanilla, coffee, hazelnut and chocolate, particularly in dairy foods and beverages, from milk and yogurt to frozen delights. Culinary applications benefit from coconut flavors too, such as spicy curries, smoky meats and savory vegetable stews.

Spotlight on Naturals

Through natural extracts, brands can find new avenues to connect with consumers and meet evolving expectations and demands, from a focus on health to a desire for exploration. It takes a scientific approach to investigate and understand the intricacies of natural extracts. Bringing those complexities to the forefront in food and beverage formulations takes an artful approach to champion distinct flavor profiles, along with other unique benefits from mouthfeel to wellness attributes. Partnering with a global supplier with deep formulation and flavor expertise alongside an extensive ingredient library can unite the art and science needed to inspire innovation with natural extracts across product categories.

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How to Stay on The Cutting Edge of Better-For-You Flavor Formulations

The market is expanding exponentially—here's how to capitalize.

BY FABIO CATONE, senior Strategy & Portfolio manager — Extracts & Beverage, Sensient Flavors & Extracts



Fabio Catone

Increasingly, consumers are looking for food and beverages that not only taste great, but also offer some sort of functional benefit, like an energy boost, workout recovery, improved digestion, or better brain health. In fact, the "Better for You" market is expanding exponentially — thanks to a younger generation of consumers who continue to push the envelope and demand more out of everything they eat and drink. It's predicted that this segment of the market will grow by nearly $200 billion by 2030[a].

However, when trying to bring products like this to market successfully, food and beverage developers and manufacturers are quickly learning that it's not always easy to make "Better for You" products taste good. Generally speaking, the ingredients that are used to create those in-demand functional benefits intrinsically bring components that have notes of bitterness, astringency and other unpleasant flavors.

[a]*https://foodinstitute.com/focus/liquid-i-v-exec-better-for-you-beverage-market-growth-set-to-accelerate/#:~:text=We%20know%20the%20market%20for,pace%20from%202023%20to%202029.*

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The "Better for You" market is expanding exponentially — thanks to a younger generation of consumers who continue to push the envelope and demand more out of everything they eat and drink.

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Some sodas, coffees, and teas have added vitamins, and the manufacturers refer to the products as "fortified."

Fortunately, natural extracts coupled with flavor maskers can be the solution. The right flavors and extracts partner can help you formulate something that offers a functional benefit *and* tastes great — it doesn't have to be one or the other.

What does "Better for You" entail, exactly?

When people say they want a great-tasting beverage that's good for them, they're talking about obtaining benefits; anything that boosts brain health or attention focus is very popular. Other strong performers include products that enhance gut health and digestion. Add-ins for boosted energy and improved mood are also common, as are products formulated to promote workout recovery.

While the food industry overall is reacting to this demand by rolling out new and reformulated products, beverages are showing especially strong participation in the better-for-you trend.

An easily recognizable example is probiotic sodas. Some sodas, coffees, and teas have added vitamins, and the manufacturers refer to the products as "fortified." Probiotics make any beverage more functional, and consumers associate probiotics with gut health. Other examples include:

- Beer and other alcohol with caffeine for energy, or probiotics in products like fermented hard kombucha.
- Sports drinks, long established in this area, with additional benefits such as enhanced hydration, extra protein or an energy boost.

For success, producers should formulate these functional benefits in a way that can:

- Add the actual function in some way
- Add association/perception of these functions
- Or improve the taste of an ingredient that has added that function

3 Ways Extracts Contribute

The best way to achieve the "Better for You" goal is by utilizing natural, plant-based extracts that can enhance the taste and contribute to the concept of holistic benefit; some extracts might even reinforce the health benefits associated with the product.

Some examples of how extracts improve the overall product viability include:

1. Clean Label: One in four buyers say they look to clean labels as a primary route to health. Extracts are easily identified ingredients and lend themselves to photo treatments on packaging.

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(FEMA 3578)

2. Positive Association: There is a subconscious expectation associated with certain ingredients. For example, ginger provides the perception of gut health and improved digestion. Lemon extract is seen as the purest form of the ingredient.

3. Natural Taste: Thanks to their true-to-nature flavor contribution, extracts can play a big role in enhancing the flavor of functional beverages by bringing profiles that can go along well with the off notes caused by functional ingredients. Plus, extracts can provide a more natural taste and mouthfeel than a synthetic or artificial version.

Using extracts also can have logistical benefits. Depending on the extract's form — liquid, powder, CO2 product — it could offer the very real benefit of extended stability and longer shelf life.

Bringing It All Together

Moving from ideation to production and achieving success in the market means attaining a series of milestones. Manufacturers should work with a partner who can help in these key areas:

Formulation: It sounds basic, but make sure your product tastes good. When many typical better-for-you ingredients are added, they can have a negative effect on taste. Examples are pure caffeine and pea proteins (think protein powders). Formulate around the functional benefit with flavor maskers or enhancers to create a product that is appealing in both benefit and taste.

Multiple Solutions: Work with a partner who can offer a broad portfolio of extracts. For example, orange extracts are often associated with an immunity boost, while ginger root extract is associated with gut health and better digestion.

Clean Label: Consumers who care about a functional benefit[b] also often care about products having the cleanest label possible.

Perception: Consumers often associate certain flavors with specific benefits, even if the actual ingredient is not present. So, a citrus flavor gives the perception of immunity boost. The ginger flavor is perceived as good for digestion. The chocolate flavor feels indulgent. Mint feels fresh and energetic. Manufacturers can tap into

[b]*https://www.innovamarketinsights.com/trends/clean-label-trends/*



Sports drinks, long established in this area, with additional benefits such as enhanced hydration, extra protein or an energy boost.

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Work with a team capable of exploring techniques to get the desired result, whether that's functional benefit, consumer perception, optimal taste, or even other sensory elements like mouthfeel or aftertaste—and all with a clean label.

existing perceptions when considering formulations if they are working with a partner who can offer the widest possible palette of extracts. An example? A caffeinated water product could be improved with a lemon flavor to improve taste while also adding a fresh, energetic, immunity-boosting impression to a product that now feels a little more special.

The Right Partner is Key

All the above strategies are only possible if the extract provider can meet as many demands as possible. That means being more than an order taker. A vendor should be a true partner, working to understand the client's goals and help develop a solution or multiple solutions to choose from; they should be part of the process — from conception to formulation ideas to incorporating trends to completing the functional task. Customers should be able to lean on their extract-solutions partner to help bring an idea to life.

Look for a supplier with the breadth to provide several ways to accomplish product goals. Work with a team capable of exploring techniques to get the desired result, whether that's functional benefit, consumer perception, optimal taste, or even other sensory elements like mouthfeel or aftertaste—and all with a clean label.

Healthy Ingredients Now, Healthy Market Share Tomorrow

Consumer demand for great taste coupled with maximal benefits isn't going anywhere. It's important to be looking ahead and working with partners who share that vision. Consider the possibility of setting trends and collaborating on new twists and products for upcoming seasons well ahead of time.

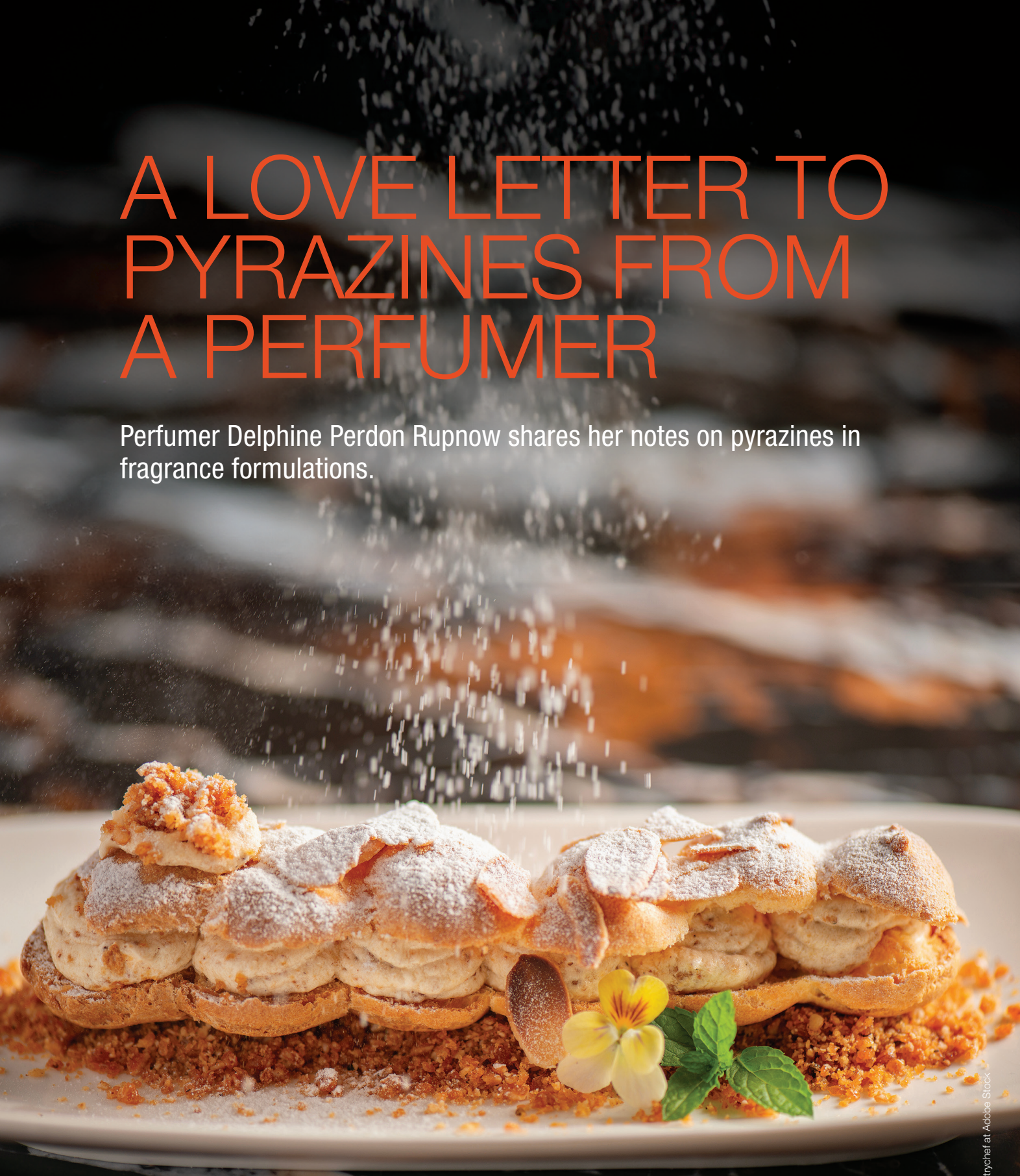
The "Better for You" market is expanding exponentially. Functional benefits in beverages are clearly the future, as demand continues with Millennials to Gen Z. It's not easy to make these products taste good, and consumers will no longer surrender taste to achieve a benefit. To succeed, partner with an extracts supplier who already has the proven tools and technical capabilities to formulate something that offers a functional benefit *and* tastes great. Get it all lined up and see how extracts can be a game changer in achieving all your product goals.

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A LOVE LETTER TO PYRAZINES FROM A PERFUMER

Perfumer Delphine Perdon Rupnow shares her notes on pyrazines in fragrance formulations.



Perdon Rupnow reproduced one of her favorite French desserts the Paris-Brest puff pastry base garnished with hazelnut praliné and cream by using five different pyrazines to complete her vision.

Image by robcthepastrychef at Adobe Stock

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I have always loved traditional French sweets, decadent desserts and anything chocolate. It's only natural that being a perfumer, I am bound to create gourmand notes of all kinds. They are an ode to nostalgia bringing back wonderful childhood memories and reminding me of a time that is now long gone.

At the heart of those gourmands, subtly lie pyrazines. They are a keynote in perfumery, yet secretly hide in our formulas, giving them depth, character and a stunning dimension. Mastering the art of mixing and adjusting their concentration can be quite an arduous task.



Pyrazines can be found in nature, developed in wine and are a component in other plant-based sources such as bread, nuts, bell peppers or cocoa.

Versatility

Another string to their bow, due to their low usage level, is their ability to blur the lines of analytical techniques, making it harder for competitors to copy or extract the scent. Many kinds of pyrazine molecules are available. They share a similar aromatic heterocyclic structure, with two nitrogen atoms 'face-to-face' amongst the carbon patterns. Some have connected alkyl groups, and tend to be sweet, nutty, and chocolatey. Those containing alkoxy groups are green, vegetable-like, savory, or even galbanum-like. The most well-known example is galbazine.

Pyrazines can be found in nature, developed in wine and are a component in other plant-based sources such as bread, nuts, bell peppers or cocoa. They are produced from organic synthesis reactions, such as Gutknecht's condensation or Staedel-Rugheimer's pyrazine synthesis. As natural molecules, they can also be extracted from vegetables, or obtained through fermentation processes. It's fascinating how they can be used in both natural and conventional perfumery.

Jean-Claude Ellena mentioned in his *Journal of a Perfumer* that he used them cautiously as a blend in his creation 'Bois Farine' from L'Artisan Parfumeur. This is one of the first fragrances that struck me as a young perfumery student, with its incredibly unique creamy, powdery dry, and salty woodiness, and a little *je ne sais quoi* that I could not quite pinpoint at the time. Until I became more advanced in my perfumery education, it was then that the magic of pyrazines unfolded.

Their multi-faceted super-power extends to forge a bridge between the world of flavors and fragrances. I am lucky to work at a company (Bell Flavors & Fragrances) where both divisions collaborate under the same roof, piquing my curiosity and inspiring me every day. After all, our senses of taste and smell are so closely related as they activate similar zones in our brains and can facilitate a wide array of emotions: surprise, pleasure or even disgust. When I first encountered pure pyrazines in the lab, I remember thinking they smelled like extra strong dirty old socks with a hint of creamy cooked rice—but in a pleasant way!

Click above to play

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Many kinds of pyrazine molecules are available. Some have connected alkyl groups, and tend to be sweet, nutty, and chocolatey.

Formulating

In Singapore, where I lived and worked from 2009 to 2017, there was a bold pungent-smelling, bright green-looking herb called Pandan leaf that had a very similar odor, with an added coconut milk impression. This Southeast Asian plant was intriguing, and I later discovered that it was used to flavor and color regional sweet delicacies, such as biscuits, cakes, beverages and even rice (Thai cendol, Malaysian seri muka, Filipino buko pandan, Peranakan chiffon cake, etc.). It inspired me to imagine an accord that would evoke this memory, using a combination of pyrazines, including one with a sulfur atom 2-methylthio3(5/6)-methyl pyrazine reminiscent of toasted popcorn and peanut, with a green vegetable nuance.

I then reproduced one of my favorite French desserts the Paris-Brest puff pastry base garnished with hazelnut praliné and cream. I renamed it 'Paris-Chicago' where Bell's headquarters are located and in reference to my dual citizenship and culture. This was part of an emerging trend program for gourmands and nostalgic scents a few years back, and I was amazed at how fun it was to create those, having such a precise image in mind and taste in my mouth. I ended up using five different pyrazines to complete my vision, plus other high-impact ingredients.

Another challenging, yet regressively delicious accord to re-create was the famous hazelnut chocolate spread that I eventually used as a note in personal and air care. This well-known treat needed to take shape to be an accessory that I could use and interchange in various capacities. Sweet pyrazines, such as 2-acetyl pyrazine or trimethyl-2,3,5- pyrazine were key to obtaining the character and unique hazelnut yumminess, building a smooth and milky feel, evocative of the creamy texture of the product. Bon appétit!

Final Thoughts

With endless combinations and possibilities, no matter what the creative idea is, pyrazines come in handy, and their extreme intensity and versatility make them great candidates for high-impact formulation. Nowadays, with sustainability at the center of all interests and concerns in the fragrance industry, they make sense. Pyrazines remain non-toxic to the environment and do not present an immediate health risk, certainly even less at the 'microscopic' levels they call for. Life would be so boring without them!

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FEMA	2460	Ethyl Tiglate EU Natural (New)
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FEMA	3243	Beta-Damascone EU Natural (New)
FEMA	3761	5-Methyl-2-hepten-4-one EU Natural, Chiral
FEMA	2594	Alpha-Ionone EU Natural, Chiral (+100 degree)
FEMA	3272	2,5-Dimethyl Pyrazine EU Natural
FEMA	3273	2,6-Dimethyl Pyrazine EU Natural
FEMA	3155	2-Ethyl-3-Methyl Pyrazine EU Natural
FEMA	3919	2-Ethyl-6-Methyl Pyrazine EU Natural (New)
FEMA	3149	2-Ethyl-3(5 or 6)-Dimethylpyrazine EU Natural
FEMA	2361	Delta Decalactone EU Natural, Chiral
FEMA	2401	Delta Dodecalactone EU Natural, Chiral
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FEMA	3204	Sulfurol EU Natural
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FEMA	3555	2-Isopropyl-4-Methyl Thiazole EU Natural
FEMA	3680	2-Ethyl-4-Methyl Thiazole EU Natural (New)

How Gen Z and Social Media are Changing the Fragrance Game

Don't miss these two sessions discussing the next generation of fragrance at World Perfumery Congress 2024.



The #fragrancetok movement on TikTok has created a renewed craze for fragrance exploration, especially among younger consumers.

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Two topics surging in the fragrance industry: fragrance trends geared toward Gen Z and the influence of social media on the fragrance industry. Both will be explored during this year's WPC conference.

We are just two months away from the return of *World Perfumery Congress* (*WPC*)! On behalf of presenters American Society of Perfumers, and produced by Allured Business Media, we are proud to announce that *WPC* is heading to Geneva, Switzerland, on June 24-27, 2024, at Palexpo. For information on registration rates, *visit www.worldperfumerycongress.com*.

>>> **Get your ticket ASAP for the best rates!** <<<

The event hosts an expo hall, networking opportunities and conference sessions. *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. Two topics that are tightly woven are fragrance trends geared toward Gen Z and the influence of social media on the fragrance industry. Both will be explored during this year's conference.

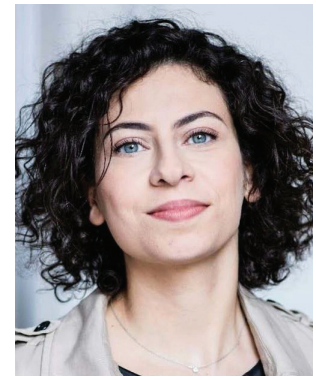
Gen Z

On Wednesday, June 26, at 10 a.m., Givaudan fine fragrance perfumer Nisrine Grillé alongside Arnaud Guggenbuhl, global head of Marketing, Insights & Image, Fine Fragrance will take the stage for their session, "**Understanding & Capitalizing on Gen Z's New Olfactive Codes**."

Nisrine Grillé, Fine Fragrances perfumer, Givaudan

Nisrine Grillé favors perfumes that are, as she puts it, rock and roll, and she signs fragrances with strong personalities, that give those who wear them a certain charisma. "What I like is creating bold perfumes, that spark questions," she explains.

"The challenge is then to work to get people to accept



Nisrine Grillé, Fine Fragrances perfumer, Givaudan.

From to: image by Tatyana at Adobe Stock; courtesy of Givaudan

what bothers them." She does that by mastering contrast and balance "such as yin and yang", without forgetting a dash of fun. She dreamt of becoming a perfumer and put all her heart and her emotions into her creations, to transmit them to others and reach her public, "the ultimate recognition." To that end, this hypersensitive perfumer makes sure she is available to find inspiration wherever it comes from a film, a texture, a color, a ray of sun, a taste, a person or a piece of music. Music is her second love, and she is a singer, guitarist and bass player in a group.

And ideally, her next creation? "A beautiful white flower wearing cowboy boots under her wedding dress –a strong signature."

Arnaud Guggenbuhl, global head of Marketing, Insights & Image, Fine Fragrance, Givaudan



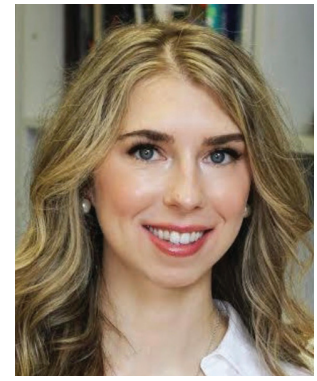
Arnaud Guggenbuhl, global head of Marketing, Insights & Image, Fine Fragrance, Givaudan.

After more than 10 years spent in various product development marketing positions for beauty giants including Unilever and L'Oréal that allowed him to be recognized as a global beauty expert, Arnaud Guggenbuhl joined the world of perfumery. First at Takasago then at Givaudan, the leader of this industry. For 10 years he has specialized in the field of Fine Fragrance, being in contact with the key global groups in the sector and helping them in the construction of their strategies. Over the years, he has developed a 360° vision of the Fine Fragrance category, creating synergies between global market intelligence and olfactory perspectives. His skills cover innovation, analysis of societal changes, consumption habits and olfactory trends that he articulates to find new business opportunities and imagine the future of Fine Fragrance.

#FragranceTok

Fashion Snoops senior strategist for Beauty & Wellness will take the stage to break down, "**FragranceTok: How Social Media is Changing the Fragrance Game**," on Thursday, June 26, at 4 p.m. The #fragrancetok movement on TikTok has created a renewed craze for fragrance exploration, especially among younger consumers. Understanding how consumers are interacting with fragrance through social media is key to viability in the modern area: to help brands understand this movement, join global trend forecasting agency Fashion Snoops and Senior Strategist Mallory Huron, who will explain how the trend developed, highlight notable creators and innovators, as well as key trends.

Mallory Huron, senior strategist for Beauty & Wellness, Fashion Snoops



Mallory Huron, senior strategist for Beauty & Wellness, Fashion Snoops.

Mallory Huron is a Beauty & Wellness senior strategist at Fashion Snoops, a global trend forecasting agency. Huron is passionate about beauty, wellness, and food trends, working with the Fashion Snoops Beauty & Wellness team to craft thematic trend stories rooted in cultural shifts. Previous to Fashion Snoops, Huron worked with makeup artist and travel entrepreneur Stephanie Flor for the Around the World Beauty brand. Huron has been featured in Dazed Digital, The Strategist, Vogue, Coveteur, and Glossy, and has presented at global trade shows including Cosmoprof North America, Cosmoprof Worldwide Bologna, In-Cosmetics, MakeupIn, Clean Beauty London, and more, and is a regular contributor to Global Cosmetic News' In Conversation With podcast series.



L to R: courtesy of Givaudan; Fashion Snoops



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- NATURAL ACETOL
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- NATURAL ALLYL PROPIONATE
- NATURAL ALPHA-BISABOLOL
- NATURAL AMBRETTOLIDE
- NATURAL CIS-4-HEPTENAL
- NATURAL DIMETHYL BENZYL CARBINYL BUTYRATE
- NATURAL ETHYL-2-METHYL BUTYRATE
- NATURAL ETHYL-3-HYDROXY BUTYRATE
- NATURAL FARNESYL ACETONE
- NATURAL GERANYL ACETONE
- NATURAL GERANYL BENZOATE
- NATURAL GERANYL CAPRYLATE
- NATURAL HEPTYL FORMATE
- NATURAL HEPTYL PROPIONATE
- NATURAL NERYL FORMATE
- NATURAL NERYL ISOVALERATE
- NATURAL NOOTKATONE
- NATURAL SULFUROL
- NATURAL TRANS-2-DECENOIC ACID
- NATURAL VALENCENE

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

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