October 2023
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The Resource for Sensory & Wellness Innovation



Exploring Evolving Consumer Tastes in Modern Confectionery

What's on the *Flavorcon* 2023 Menu

Talking Consumer Taste

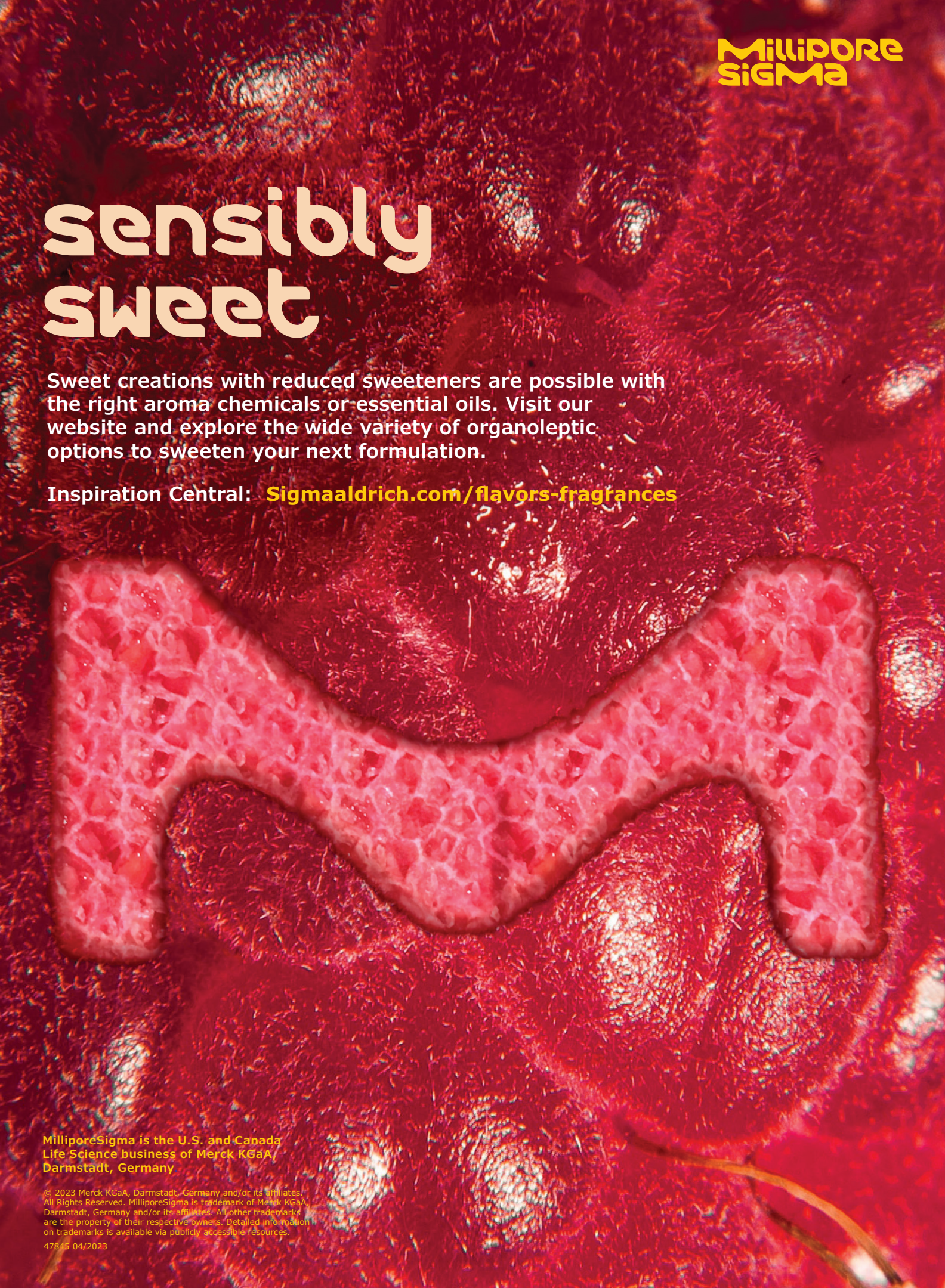
Celebrating the return of Flavorcon and flavor's fruitful future in confectionery and beyond.

5 Trends Shaping the Bath & Body Care Industry

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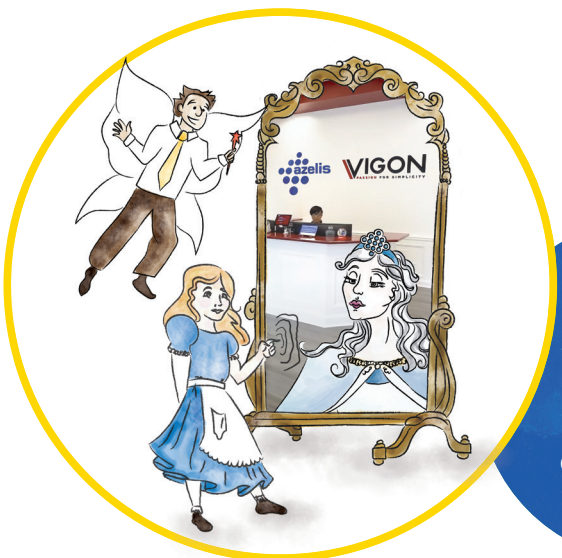
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Want to report a new development at your company?

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How to Adjust for Shifting Consumer Tastes



Amy Marks-McGee's "Forward Thinking" column examines how Gen Z is influencing the bath and body care market.

The flavor and fragrance industry is in the business of stimulating the senses. The October issue is dedicated to exploring the personal care market, as well as what's shaking in confectionery. We've tapped industry specialists to highlight the recent trends while outlining white space in both markets.

With every new class of consumers, we see shifts in various markets. The bath and body care segments are getting a lot of attention thanks to Gen Z's influence on TikTok. On page **36**, readers can find Trendincite Amy Marks-McGee's latest Forward Thinking column discussing "5 Trends Shaping the Bath and Body Care Industry."

On the hunt for more insight from key players in the industry? Readers can also access podcasts, video interviews as well as other multimedia coverage by visiting *perfumerflavorist.com/multimedia*. In November 2023, we'll debut an exclusive podcast with Iberchem Global Fragrance Development manager María-Ángeles López Martínez. Tune in to discover how the home care arena has shifted since the COVID-19 pandemic, leading claims that consumers are looking out for on product labels, the latest technologies on the market and more.

Also in the pages ahead, flavor enthusiasts can get a taste of the key drivers sparking innovation in the confectionery category. What's trending, leading consumer demands and more can be found on page **44**. Have a question for an industry expert on a confectionery formulation or other facets of flavor? Email your questions to jtroyli@allured.com.

Speaking of tasty, readers can also find the entire session line-up for *Flavorcon* 2023 (*www.flavorcon.com*) on page **50**. Don't miss your chance to learn, grow and connect with the flavor industry on November 8-9 in Cincinnati!



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INDUSTRY INSIGHTS: VANILLA & VANILLIN

Industry insider discusses traceability and sourcing updates, client demands and the future of the markets.



Featured Insider:

- Solvay

Transparency and sustainability are two important topics for consumers today.

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The global vanilla market is expected to witness significant growth during the forecast period of 2023-2030, expected to reach $3,151.76 million by 2030 according to Consegic Business Intelligence[a]. What are the drivers of this significant growth, and what role does vanillin play?

Perfumer & Flavorist+ (*P&F+*) connects with Solvay's technical marketing manager Mary Ronan to discuss traceability and sourcing updates, client demands and the future of vanilla and vanillin.

MARY RONAN, technical marketing manager, Solvay

***P&F+*: What are clients asking for when it comes to vanilla/vanillin?**



Mary Ronan

Mary Ronan [MR]: Vanilla is one of the most appreciated flavors in the world. However, vanilla beans only make up about 1% of the vanilla flavor in the food and fragrance industries. With the unpredictable cyclones and climate changes, the quality of vanilla beans have large variations and volatile prices. This is why vanillin, which produces the vanilla taste, is such an important ingredient. As the Natural and Clean label trend grows, more natural alternatives for vanilla beans are needed. Solvay's Rhovanil[b] Natural CW, a natural vanillin made by fermentation, is a solution for clients asking for clean labels and natural claims. This natural vanillin has the consistency in taste, quality, and food safety versus vanilla beans that companies have come to expect from Solvay with the benefit of being labeled as natural in both the EU and U.S.

Another trend in the food industry is health and well-being. Many clients are interested in reducing sugar in sweet goods. Consumers associate the vanilla taste with sweetness. Rhovanil Natural can boost the sweetness perception in traditional and sugar reduced products without adding extra calories to the food products. Vanillin is also a solution for masking off notes in high protein products. Vanillin masks bitterness of proteins by interactions of bitter receptors. Vanillin can also decrease off notes of proteins while increasing the sweetness and mouthfeel. Since 75% of flavored protein drinks have either vanilla or chocolate flavors, Rhovanil Natural is a perfect fit to round out the client's nutrition drink profile.

***P&F+*: In terms of traceability, can you touch on some developments in vanilla/vanillin sourcing?**

MR: Transparency and sustainability are two important topics for consumers today. They want to know where their food comes from and if it was ethically sourced. Solvay's Rhovanil Natural CW starting raw material is a non-GMO and non-GMM rice bran. The rice bran is a by-product of the rice bran oil value chain and does not compete with any food source. Solvay upcycles this by-product which is transformed into natural vanillin compliant with EU and U.S. natural flavors regulations through biotechnology. Solvay's investments in food safety and biotechnology ensure that we manufacture our Rhovanil Natural CW with stringent quality, traceability and consistency

***P&F+*: The industry is seeing many launches in natural vanillin, what does the future look like for vanillin & vanilla?**

MR: As the trend of natural and clean label food continues, there will not be enough vanilla beans for the industry's needs. Natural vanillin from fermentation, as made by Solvay, is becoming an important ingredient to enhance the growth of natural formulations in the food industry. Whether clients are developing new clean label recipes, switching to natural, or trying to remove complex flavors, Rhovanil Natural CW can answer their market needs. For health and wellness challenges, natural vanillin is more than a flavor. It can solve many problems like masking off notes and increasing sweetness in a variety of applications: Beverage, Baked Goods, Reduced Sugar, Nutrition, Chocolate, and Confectionery. Solvay, a historical vanillin player, has the industrial expertise to grow natural vanillin to meet the industry needs of today and tomorrow.

p&f+

[a]*https://www.globenewswire.com/en/news-release/2023/06/26/2694581/0/en/Vanilla-Market-on-the-Rise-Anticipated-to-Hit-USD-3-151-76-Mn-By-2030-Consegic-Business-Intelligence-Study.html*

[b]Rhovanil is a trademark of Solvay

Ingredients and Equipment

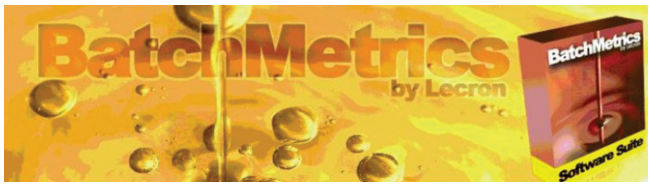


Pimento Leaf Oil

Berjé Inc.

www.berjeinc.com/products/essential-oils/pimento-leaf-oil/

Pimento leaf oil is steam-distilled from the fragrant leaves of the Pimenta dioica tree, a botanical more commonly known for allspice berries. The oil has a warm and spicy profile, indicative of its high eugenol content. It also imparts a pleasant dry-woody character, separating pimento from similar oils like clove.

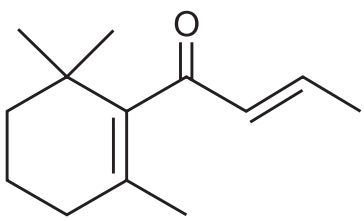


BatchMetrics

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BatchMetrics is celebrating 25 years in the F&F industry. Mature and user-centric MES built on decades of evolution, focused on full production traceability. Providing worldwide 24/7 reliability for eight of the Top 10 F&F manufactures. We estimate more than 50% of the world's entire volume of F&F products touches BatchMetrics.



β Damascone

Hangzhou Grascent Co., Ltd

www.hangzhougrascent.com

1-(2,6,6-Trimethylcyclohex-1-en-1-yl)but-2-en-1-one; Dihydro floriffone B; (E)-1-(2,6,6-trimethylcyclohex-1-en-1-yl)but-2-en-1-one. β Damascone features a powerful fruity floral note with a complex odor of rose, plum, blackcurrant, wine and tobacco. Suggested applications include fine fragrance, personal care, fabric care and home care. Recommended use level is traces to 0.2%.



2-Ethyl-4-Hydroxy-5-Methyl-3(2H)-Furanone

Natural Advantage, LLC

www.natadv.com

Natural Advantage introduces natural 2-ethyl-4-hydroxy-5-methyl-3(2H)-furanone (FEMA# 3623, CAS# 27538-09-6). 2-Ethyl-4-hydroxy-5-methyl-3(2H)-furanone is also known as HomoFuraneol and occurs naturally in coffee and fermented soy sauce. While flavor can be described as sweet and sugar-like, the aroma has very brown, caramellic, maple-like properties as well as savory soy sauce and bread notes. HomoFuraneol reminds you of caramel covered fruit and smoked ham at holiday gatherings. This material can be used in fruit, tropical, meat, coffee, candy, cola flavors and baked goods. Recommended use level is 0.005-5 ppm as consumed. It is EU and U.S. natural, kosher, non-GMO and vegetarian.



Aprifloren

Symrise AG

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

Symrise Aprifloren®, which is found in mandarin peel, meets today's requirements for sustainability by being readily biodegradable and renewable. It imparts overall naturalness to creations,and adds a beautiful element to fine fragrance and personal care applications. Aprifloren® also offers excellent blooming properties. Aprifloren®— the blooming glory.





Gum Dammar (AKA Gum Damar)

William Bernstein Company

www.wbernsteinco.com/portfolio/gum-dammar/

Family: Dipterocarpaceae; Genus: Shorea; Country of Origin: Indonesia. Extracted by tapping of the trees. Slight balsamic odor. Used in foods/beverages (for texture and binding properties and as incense. Colorless to slightly yellow in color; largely translucent.



2-Acetyl-2-Thiazoline

Penta International Corp.

www.pentamfg.com

Now offering 2-acetyl-2-thiazoline (FEMA# 3817, CAS # 29926-41-8, JECFA# 1759) containing a flavor base of corn chip, taco, potato chip and toasted nutty bread. Odor notes as corn chip, green onion, toasted nutty bread and roasted chicken. Our material is food grade, kosher and halal.

Döhler Group Acquires Boon Flavors Thailand to Expand Footprint in Southeast Asia

Döhler has announced the acquisition of Boon Flavors, a premium flavor house located in Bangkok, Thailand. As part of this acquisition, Boon Flavors will be known as Döhler Thailand going forward and be managed by the company's founder, Piya Boonnamkitsawad.

In 2018, Boon built a state-of-the-art flavor plant in Bangkok. Boon will have access to all of Döhler's taste technologies and as well as application labs in Indonesia and Thailand.

Boonnamkitsawad shared, "Teaming up with Döhler, we are looking forward to enhance our customer-oriented culture, foster long-term customer relationships, expand and strengthen our presence in the Southeast Asia market and continue delivering top-quality products while effectively supporting customers´ demand for more sustainability."



In 2018, Boon built a state-of-the-art flavor plant in Bangkok.

IFF Appoints Casper Vroemen, Ph.D., as Chief R&D and Sustainability Officer

On August 3, 2023, IFF announced that Gregory Yep, Ph.D., has resigned as chief R&D and Sustainability officer effective September 1, 2023 to pursue a new opportunity in his professional journey. Yep will be succeeded by Casper Vroemen, Ph.D., who is currently serving as vice president of R&D, Health & Biosciences. Vroemen has dedicated his career to the advancement and commercialization of leading-edge biotechnology. Vroemen will be based in Union Beach, New Jersey, and will become part of IFF's Executive Leadership Team.



IFF has tapped Casper Vroemen, Ph.D., as next Chief R&D and Sustainability Officer.

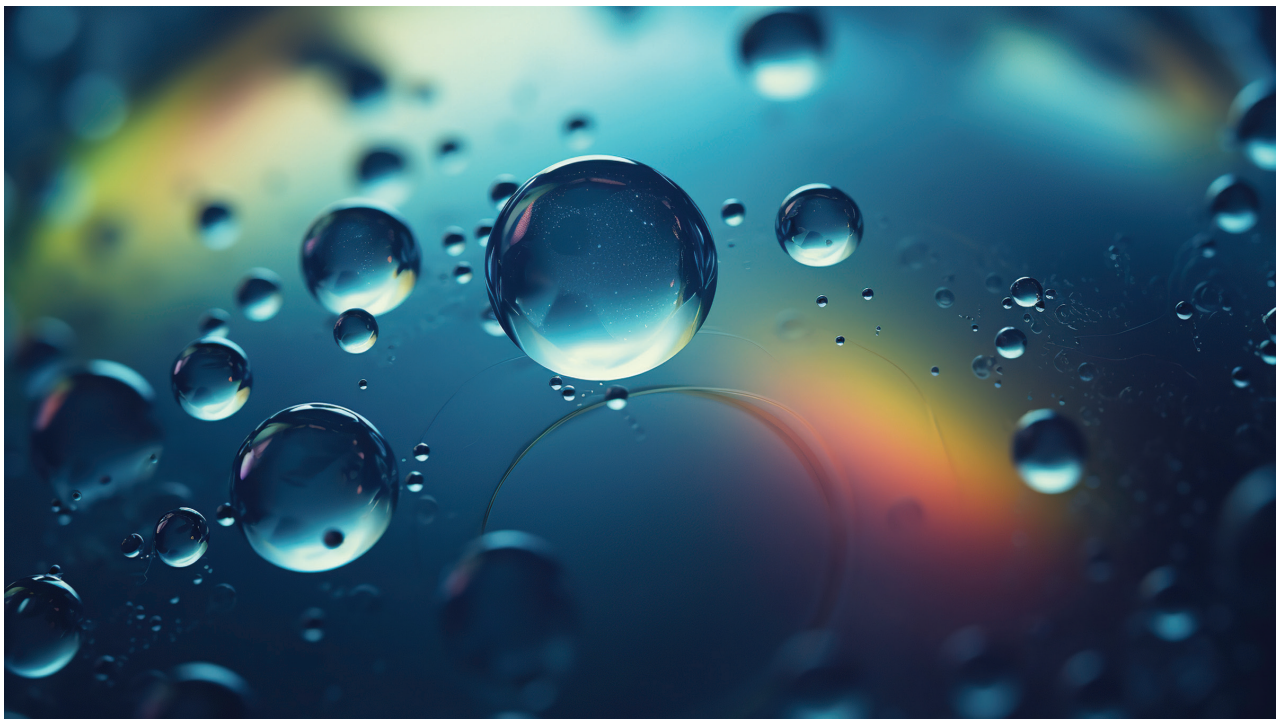
"Through Greg's leadership, we have established IFF as the go-to partner for science-backed solutions for the health, fragrance, nutrition and home and personal care markets," said Frank Clyburn, IFF CEO. "We thank Greg for his many contributions, and wish him well in his future endeavors. We have a strong successor in Casper, who will continue to advance our innovation pipeline and sustainability efforts."

Vroemen joined IFF in 2004 as a scientist and project leader. Over the past two decades, he has assumed roles of increasing responsibility in research and development in Europe and the U.S., and has played a major role in establishing IFF as a bioscience powerhouse. During his tenure, he oversaw the company's leading position in the protein engineering of industrial enzymes, contributed to the commercialization of multiple new technological advancements, and is a prolific inventor named on many patents.

As chief R&D and Sustainability officer, Vroemen will further IFF's efforts in innovation, leading the company's global R&D strategy, technological development, innovation pipeline and external collaborations. Vroemen holds a Master's of Science in Molecular Life Sciences and a doctorate in Molecular Biology, both from Wageningen University in the Netherlands.

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Mane Debuts Aquafine Liquid Scent Booster

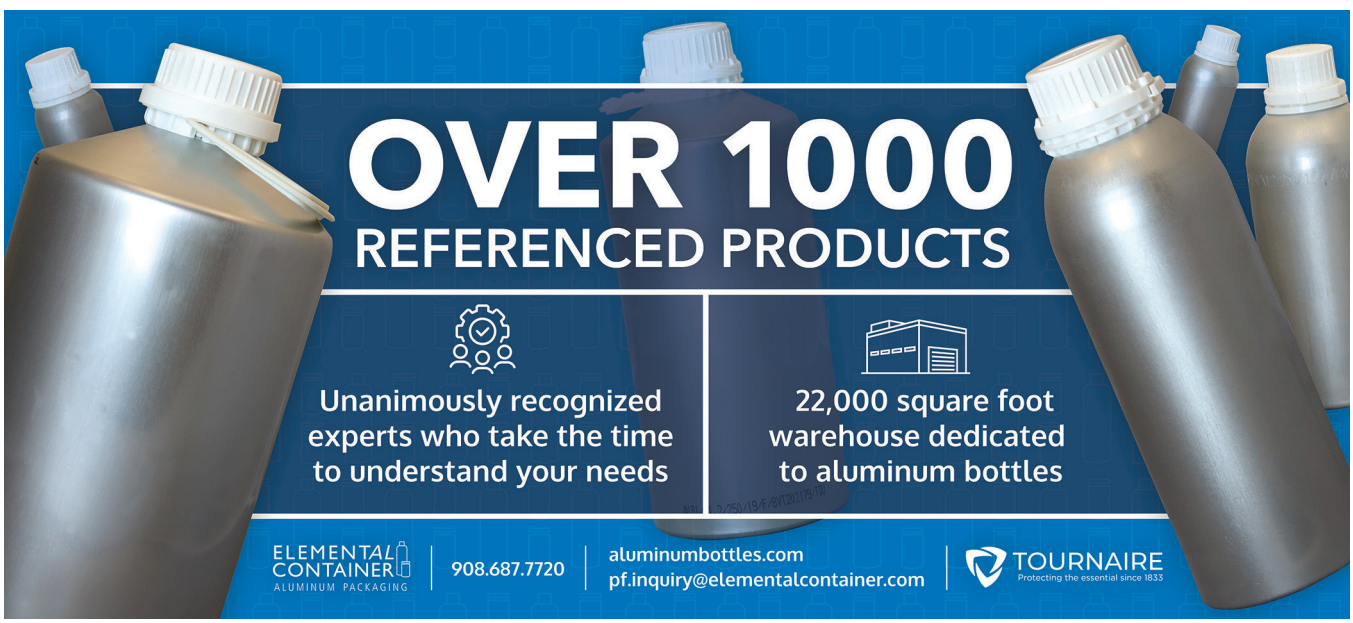


The alcohol-free formula is designed to encapsulate fragrance molecules in tiny droplets to result in a completely transparent emulsion with a high concentration of perfume.

Mane has introduced the company's latest fragrance technology tool—Aquafine (stylized "AQUAFINE").

The microemulsion perfume is said to be biodegradable and alcohol-free. Aquafine is designed to encapsulate fragrance molecules in tiny droplets resulting in a completely transparent emulsion with a high concentration of perfume.

According to Mane's website, Aquafine offers "a weightless texture that feels soft and delicate on the skin."



Multi-Sensory and Storytelling Workshops for UK Prison System



Looking to add to the Perfume Stories' fragrance library, project founder Michael O'Shaughnessy partnered with Carvansons.

UK fragrance house, Carvansons, has partnered with Liverpool Moores University senior lecturer, Michael O'Shaughnessy, to expand Perfume Stories: The Time Travellers project designed to uncover the impact of scent.

Perfume Stories is a series of multi-sensory and storytelling workshops based around scents and perfumes working with current prisoners within the UK prison system.

Originally making its debut in December 2019 at The Tate Gallery in Liverpool, O'Shaughnessy's project, with the support of prison education provider Novus.

Perfume Stories

These sessions take place over several weeks where the learners are asked to smell the perfumes and fragrances. They are then encouraged to undertake critical thinking and make connections between the history and context of a perfume, whilst also considering their opinions and thoughts about the scents they are experiencing.

These scents are intended to evoke memories and provide stimuli for educational exploration. Studies have shown that people can remember a scent with 65% accuracy after one year compared to the loss of visual memory which is reduced to 50% after only a few months.

For many of the learners, these initial responses become starting points for other creative practices such as creating writing, poetry, spoken word or image making.

O'Shaughnessy explained, The response we have had to this project has been fascinating. For some of the participants these scents evoke childhood memories, some of them positive and some less so. They are, however, a different way of attempting to reach individuals who may have otherwise chosen not to engage with educational projects."

He continued, "This alternative approach to learning and describing past emotions and experiences is something that the project participants may not have experienced before. They engage well with both history and the neuroscience behind what they are smelling. Their own stories can be really profound, but the intention is that they leave with greater knowledge and an understanding that learning can be liberating."

Michael was approached by the prison education provider, Novus to trial the project with prisoners at HMP Liverpool. The response from the prisoners was so positive that it has since been introduced at HMP Hindley and HMP Buckley Hall. Novus are the

education and skills provider in over 50 prisons across England and Wales. By working closely with Sarah Hartley, the National Lead for Creative Strategies and her team, Michael then looked at ways to elicit emotional and analytical responses from prisoners.

This project is said to directly link to the wider prison service agenda around rehabilitation and reform. One of the key goals for this project is to support the aims of Novus in addressing low literacy rates of offenders and evaluate the impact it may have on reoffending rates across prisons in the UK. These reform-orientated projects are critical in rehabilitation and in attempting to curb re-offending rates. These sessions not only provide a creative outlet but also build their confidence around learning.

Expanding the Fragrance Library

Looking to add to the Perfume Stories' fragrance library, O'Shaughnessy partnered with Carvansons.

O'Shaughnessy shared, "I approached Carvansons with this project because of their fragrance knowledge and expertise to see if they were interested in supporting the project and creating a couple of bespoke scents to help support the project"

Carvansons marketing manager Victoria Last added, "This was a really interesting project to be asked to be involved in. As manufacturers of fragrances and perfumes, we know how impactful scent and fragrance can be but the possibility of it being beneficial for society as a whole is intriguing."

Participant Feedback

"The moment I first detected the scent, I pictured myself standing on a shore with huge waves crashing onto the beach. I can't fully explain this image but it seems to be similar to a day in September 1988 when, aged 23 I stood on the beach at Aberystwyth looking out to sea daydreaming. The colour that came to mind, not unexpectedly was light blue. I've done a lot of education in prison over time and this project is totally different from anything I have done before."

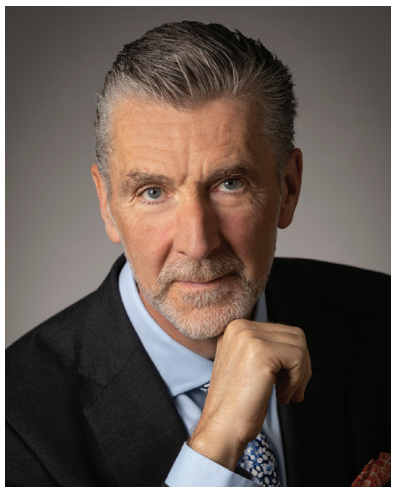
"How I respond to the past affects my future and my future can be seen in the mirror of my choosing."

p&f+

P2 Science CEO Neil Burns Announces Retirement

On August 1, 2023, P2 Science announced the retirement of Neil Burns, effective September 15, 2023. Burns will transition to an advisory role at the company.

P2's board of directors has selected co-founder Patrick Foley, Ph.D., as president to lead the company during its search for a CEO. Foley is the lead inventor of P2's main technology platforms, PIOz (ozonolysis) and PICE (Citropol,).



Neil Burns will transition to an advisory role at the company.

Burns shared, "I am honored to have led P2 over the last 12 years as the company has grown into a leader in the fields of green chemistry, high- performance cosmetics ingredients, sustainable polymers and more recently the application of AI and Machine Learning to new material design and manufacture."

He added "I'm particularly proud of the team we have put together and the talented people we have attracted from all over the country to our sites in Woodbridge and Naugatuck, CT. Given the strength of our people, culture and values, the Company is well-positioned to grow and thrive in the years ahead. This transition, provides me the opportunity to pursue a number of personal and professional passions. Of course, as an advisor to P2, I'll be on hand, as needed, to help the company on its continuing path to success."

Rob Bettigole, P2's chairman of the Board, added, "On behalf of P2's board of directors, I'd like to extend our sincere thanks and appreciation to Neil for leading P2 from a 2-person start-up to a world-renowned green chemistry company. His unstinting efforts as a champion for the company and its mission have propelled P2 to an enviable position in key markets for sustainable materials."

Foley commented, "Neil has been a leader, mentor, partner and friend over the past 12 years and P2 will be forever indebted to him for his service. We look forward though to his continued guidance as an advisor and to the next big opportunities at P2."

"Those who know Neil know he will continue to contribute to this industry that he loves in exciting and important ways."

p&f+

Inside The World's First Wearable & Drinkable Perfume Gin

Tamworth distiller and botanical chemist, Matt Power has created the world's first wearable and drinkable gin—Tamworth Garden SYLVAN MIST. The unisex fragrance and cocktail modifier, made its debut after a two-year research and development process in a 100 ml glass bottle with an atomizer spray pump.

The flavor profile boasts sunny boreal forest, fresh cut grass, violets, kiwi skin, and honeydew melon. Boronia flower and violet leaf lend to the notes of a classic perfume; with balsam fir and citrus rind working as base notes. Chamomile flowers round out the brightness, offering mellow soft, top notes.

We connected with Power to discuss how he created the multi-functional gin.



The unisex fragrance and cocktail modifier, made its debut after a two-year research and development process in a 100 ml glass bottle with an atomizer spray pump.

What were some of the components that needed to be considered while creating this product?

Matt Power [MP]: A lot of our gins have been described as "perfumey" over the years, likely owing to the broad spectrum of aromatic volatilities that we incorporate in them. So, carrying that approach toward a wearable gin was certainly paramount, but doing it in a way that retained palatability was really the crux of our project. While the oil content of this is lower than the most dilute perfumes, it strikes a good balance between aromatic weight and consumption.

What were some of the challenges in creating this wearable and drinkable perfume gin?

MP: The challenges with creating this product were both technical and conceptual in nature. As with all of the products produced at our facility, we knew we wanted to create something that really speaks of our region. And since many of our gins are already described as "perfumey," we wanted embellish this approach even more. That combination required delving deeper into the list of GRAS food additives to discover materials that brought both a citrus-boreal forest vibe and some traditional perfume notes like violet leaf. We wanted a bit of deep, sweet complexity and ended up settling on food-safe Boronia absolute in lieu of Osmanthus for that quality. That absolute was a brief technical hurdle as we had to distill the volatile aromatics away from some kind of heavy oil fixative that was also present in it.

Can you touch on the catalyst for creating this perfume gin?

MP: The catalyst for creating this particular fragrance was the sweet woodsy atmosphere of passing through in the high elevation boreal forests of New England. In the right weather these places emit a rich symphony of piney citrus and sweet, green herbaceousness.

From your perspective, what is the white space for innovation that crosses flavor and fragrance?

MP: In my experience, the most impactful flavors carry some emotional connection to a previous time and place. This deeper meaning seems to be a portal deeper into the psyche and its pleasure centers. It makes sense that these emotional connections can be mediated by aromatic memories and then augmented and delivered toward a unique flavor experience.

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2-Pentyl furan works well in all tomato flavors. The desired level in fresh profiles is 100 ppm.



BY JOHN WRIGHT
johnwrightflavorist@gmail.com

Flavor Bites: 2-Pentyl Furan

2-Pentyl furan in savory, brown, fruit and other flavors.

2-Pentyl furan, (FEMA# 3317, CAS# 3777-69-3) has a distinctly unusual fruity odor. On one hand it is reminiscent of pineapples but, underneath that fruity note is a cooked, almost caramel, background. This, somewhat contrasted, combination might seem to limit the usefulness of 2-pently furan. The reverse is true in practice. 2-Pentyl furan adds complexity and authenticity to the majority of "heated" flavors, and also enhances many 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 in a simple bouillon.

Savory Flavors

Bacon: More than most flavors, bacon flavors can lack complexity. 2-Pentyl furan adds useful depth and complexity at levels of addition in the region of 100 ppm.

Beef, Roast: Lack of complexity is not so much of a problem for roast beef flavors, but 2-pentyl furan softens the background and adds authenticity at 300 ppm.

Chicken, Roast: Chicken flavors, either boiled or roast, gain from the addition of 2-pentyl furan. Four hundred ppm is a good starting point.

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Ham: Lower levels, around 100 ppm, are preferred in ham flavors. At this level 2-pentyl furan enhances the boiled note.

Mushroom, Cooked: Cooked mushroom flavors need much more complexity than the familiar profile of raw mushrooms. This ingredient helps at around 50 ppm.

Onion, Toasted: In the wide universe of savory flavors, cooked onion stands out as the most compatible profile for 2-pentyl furan. Levels vary, higher in toasted onion flavors, but 500 ppm is typical.

Potato: Cooked potato flavors vary over quite a wide range of profiles. This raw material works well in all of them, from boiled to fried. The levels will vary, but 100 ppm is typical.

Seafood: 2-Pentyl furan is effective in all cooked seafood flavors, but works particularly well in shrimp flavors. Fifty ppm is a good level in plain cooked shrimp flavors, but higher levels are better when the profile is fried.

Soy sauce: The impact of 2-pentyl furan in soy sauce flavors is subtle and the ideal level of addition is only 50 ppm.

Tomato: 2-Pentyl furan works well in all tomato flavors. The level is naturally higher in cooked profiles, around 200 ppm, than fresh profiles, where 100 ppm is better.

Brown Flavors

Chocolate: 2-Pentyl furan adds a lovely caramel note to chocolate flavors, enhancing the profile significantly. Two hundred ppm is ideal.

Coffee: This ingredient can be tricky in coffee flavors. High levels can reduce the impression of freshness, but 50 ppm adds to authenticity.



Higher levels, nearer 200 ppm, are very effective in flavors, such as strawberry jam, that aim to reproduce a degree of processing.

Malt: In contrast, higher levels, around 200 ppm, add to the realism of malt and malted milk flavors.

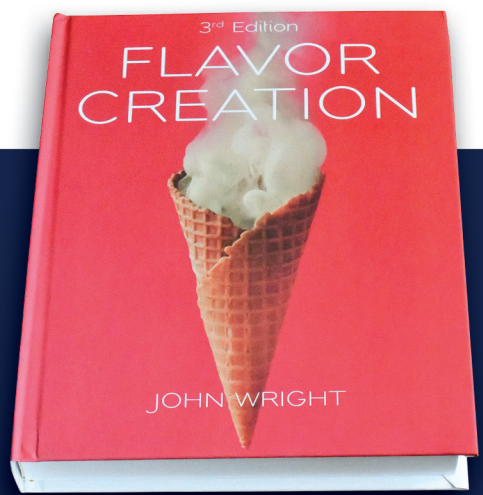
Sugar, Brown and Molasses: The brown sugar family of flavors is probably one of the most obvious homes for 2-pentyl furan. At one extreme, 20 ppm brightens even the lightest profile. At the other extreme, in molasses flavors, the sky's the limit.

Tea: This raw material plays a very useful part in all tea flavors. Black tea flavors are the most obvious use, four hundred ppm is very effective. Green tea flavors are radically different and fifty ppm is a much better level of addition.

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Fruit Flavors

Apricot: At levels around eighty ppm 2-pentyl furan takes the edge off the dominant gamma lactones and rounds out the profile.

Blackberry: Levels in blackberry flavors vary with the profile. Lower levels, around 60 ppm, work best in strongly musky profiles. When the musk note is subtle the level can be increased to 100 ppm or more.

Cranberry: 2-Pentyl furan fits extremely well into the profile of cranberry flavors, adding realism at around 200 ppm.

Guava: Just a hint, perhaps 20 ppm, adds complexity to guava flavors and reduces the dominance of methyl cinnamate.

Peach: The effect of this raw material in peach flavors is similar to that in apricot flavors. The dose rate is also fairly similar, around 100 ppm.

Raspberry: One hundred ppm is a reasonable level of addition in most raspberry flavors, adding realism.

Strawberry: Most strawberry flavors have a profile that is accented towards fresh, rather than processed. 2-Pentyl furan rounds out these flavors at levels of addition around 40 ppm. Much higher levels, nearer 200 ppm, are very effective in flavors, such as strawberry jam, that aim to reproduce a degree of processing.

Watermelon: Watermelon flavors are often far removed from authenticity and that is, understandably, a driver of consumer acceptance. 2-Pentyl furan adds to authenticity, but in a very subtle way, and ends up as a net positive. One hundred ppm works well.

Other Flavors

Almond, Toasted: Quite a wide range of levels of addition are effective in toasted almond flavors, providing very welcome complexity. Two hundred ppm is a reasonable starting point.

Brandy: This raw material is useful in all spirit flavors, and brandy is no exception. The combination of fruity and caramel notes rounds out the profile nicely at 50 ppm.

Corn: 2-Pentyl furan is closely identified with corn flavors. The levels vary much more than usual. Sweet corn flavors are ideally served by as little as 30 ppm. Toasted corn flavors are more aggressive and 200 ppm is better.



The brown sugar family of flavors is probably one of the most obvious homes for 2-pentyl furan.

Hazelnut: Five hundred ppm of this raw material is an attractive level in hazelnut flavors. The same is true of praline flavors.

Pandan: Pandan flavors are a regional specialty and can be quite challenging to create. 2-Pentyl furan softens the dominant popcorn note very effectively.

Peanut: The ideal level in peanut flavors is not as high as in hazelnut flavors. Two hundred ppm is more than adequate.

Rum: The ideal level of 2-pentyl furan in rum flavors, unsurprisingly, depends on the type of rum. It is also very much a question of taste, starting at subtle levels around 10 ppm and rising to 100 ppm and more without becoming intrusive.

Whiskey: Good whiskey flavors combine a host of different attributes, which is what makes the target beverage so attractive. The caramel and fruity notes of 2-pentyl furan fit into the jigsaw at 100 ppm.

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gamma, (-) Octalactone, Natural
FEMA 2796
coconut, vanilla, sweet

Creosol, Natural
FEMA 2671 *dilutions available*
phenolic, smoky, spicy, sweet, vanilla

Cocoal, Natural
FEMA 3199
vanilla, brown, cocoa, toffee

p-Cresol, Natural
FEMA 2337 *dilutions available*
butter, rum, vanilla, whiskey

2-Methoxy-4-vinylphenol, Natural
FEMA 2675 *dilutions available*
chocolate, rum, vanilla, sweet

Anisyl Alcohol, Natural
FEMA 2099
creamy, floral, fruity, sweet, vanilla

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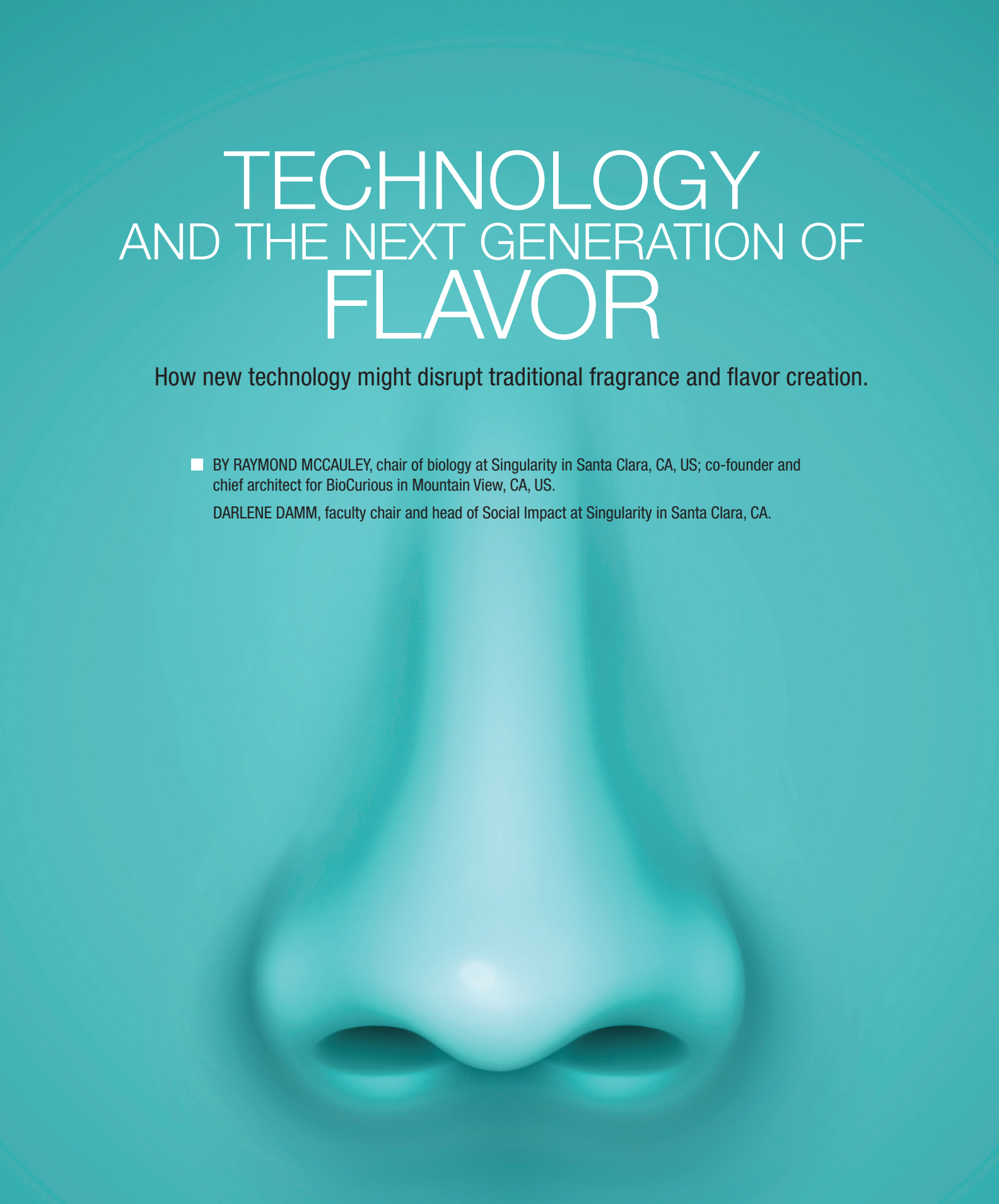
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TECHNOLOGY AND THE NEXT GENERATION OF FLAVOR

How new technology might disrupt traditional fragrance and flavor creation.

BY RAYMOND MCCAULEY, chair of biology at Singularity in Santa Clara, CA, US; co-founder and chief architect for BioCurious in Mountain View, CA, US.

DARLENE DAMM, faculty chair and head of Social Impact at Singularity in Santa Clara, CA.



Smell technology has evolved beyond simple fans to sophisticated systems that emit multiple scents in quick succession, designed to evoke a sense of place.

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Have you ever strolled through Disneyland's Main Street USA? It's a magical sensory experience, taking you back to an idyllic American town. The smell of freshly baked cookies wafting through the air leads visitors to trays and bags for sale in a charming store, alluring crowds with the help of Disney's patented "Smellitizers." This is an example of how Disney uses "smell tech" to create immersive atmospheres for memorable experiences. Today, this technology has evolved beyond simple fans to sophisticated systems that emit multiple scents in quick succession, designed to evoke a sense of place. How might new technology disrupt traditional fragrance and flavor creation, and what breakthroughs are on the horizon?

GCMS: A Boozy Detective Story

Gas Chromatography Mass Spectrometry, or GCMS, is the go-to detective tool for identifying the molecules that contribute to the taste and aroma of a complex substance. Imagine a tiny maze that every molecule in the sample must navigate. The GCMS column is that maze and the mass spectrometer at the end of it acts like a fancy scale, measuring the weight and charge of each molecule as it emerges. The result is a fingerprint-like spectrum that lets scientists study individual components or the substance as a whole.

This tech has long been used for quality control. But now, GCMS is getting a boozy makeover. Companies like Endless West are using this technology to create their Glyph molecular whiskey that mimics the flavors of traditional barrel-aged spirits, but at a fraction of the cost and in a fraction of the time. The secret? Reverse-engineering the flavor profile of the high-end spirit using GCMS, then sourcing matching molecules from plants and special yeasts (more on that later).

With GCMS, distillation and aging aren't always necessary to create a top-shelf whiskey. Lost Spirits Distillery and Bespoken Spirits use pressure, heat and light to accelerate the aging process, while GCMS fine-tunes the resulting taste profile.[2] The result? Barrel-aged flavors in a fraction of the time, ready for consumer testing and faster innovation.

Say goodbye to long waits and high prices. With GCMS, age is just a number.



Today's consumers are concerned about where their food comes from, its health benefits and environmental impacts, whether animals were harmed.

And this is the point. Not necessarily about competing with the best, most expensive, or exclusive aged spirits. It's about creating new flavors with less time and investment and exploring new markets. It's like producing prints of a popular painting—accessible to a larger audience. This innovation is comparable to Andy Warhol, who created a variety of different images based on a single original. The variation was the point, and the commercial reproducibility enabled his studio, The Factory, to create not just infamous parties, but new markets. Similarly, these technologies allow for rapid development and testing of new spirits. Once a successful flavor is found, production can ramp up without delay caused by barrel aging or uncertain supply chains. It's a new application of technology that creates equally new business models.

Precision Fermentation

Another biotechnology breakthrough making huge headway involves genetically engineering microbes to make the substances we want. This isn't new. Humans have been doing this for over 10,000 years, harnessing yeasts to make bread and beer and wine. Admittedly, the genetic engineering was just good breeding, the passing down of particular starter cultures over decades and centuries. But now we have a digitally precise understanding of genetics. Because of the advances in reading and writing DNA, we can edit specific genes and brew up yeasts to make proteins found anywhere in nature.

We used to call this synthetic biology, but the more popular term is now precision fermentation. This both harkens back to the long human history of using yeast to make useful things, and it markets better without the word "synthetic."

Vanilla is the poster-child of precision fermentation. Only about 5% of vanilla used in food and fragrance worldwide is naturally extracted from vanilla beans. Not enough plants exist to meet demand.[3] And while vanillin, the main chemical component, can be artificially synthesized, its one note does not compare favorably to the more than 200 compounds that are in natural vanilla extracts. An estimated 24% of vanilla is now precision fermentation "biovanilla." This process is more sustainable and cost-effective, and compared to synthetic vanilla it can both be labeled as a natural product and can include as many of those 200 compounds as biotechnologists care to program in.

Here are a few more examples:

- Animal-free dairy: Companies like Perfect Day can produce the same building blocks of cheese and ice cream found in cow's milk, and can even tailor the mix to leave out components where people have allergies or dietary sensitivities
- Plant-based meat alternatives: Impossible Foods uses a bioengineered heme molecule, sourced from soy but produced in yeast, to give their burgers their satisfying sizzle.
- Bean-free fermented coffee: Minus Coffee, part of Compound Foods, was created by a Costa Rican entrepreneur who loved coffee, but was also deeply concerned about coffee's impact on climate change and biodiversity, and wanted an eco-friendly coffee.
- Other examples include using precision fermentation to make flavors, natural pigments, enzymes, macronutrients (fats), micronutrients (vitamins) and sweeteners.

Note that many of these advantages are marketing advantages. Today's consumers are concerned about where their food comes from, its health benefits and environmental impacts and whether animals were harmed. Having packaging that touts lower footprints is a boost. Having ingredients labels that read "natural flavoring" or "yeast extract" also helps.





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Scalability is a particular concern. Many substances can be produced in labs at small scales, but producing them in large volumes in a short time can still be difficult.

As technology drives down the price of creating high quality, delicious, customized foods and aromas, the demand will increase even more, making a sustainable foundation for sourcing even more important.[4]

Other advantages are technical or production-based. If a natural ingredient is costly to procure, or in short supply, precision fermentation offers an abundant and controlled alternative to uncertain supply chains. It also offers advantages over artificial chemical synthesis, especially for complex compounds.[5]

Not only can many compounds be engineered into the metabolism of microbes, but also specific stereoisomers can be produced, just like in base-level nature. A great example of this is linalool, a terpene that comes in two forms: one form is hoppy, one form is lavender-like. Chemical synthesis produces both, mixed together; biosynthesis can give you just one or the other.[6]

Challenges

Precision fermentation faces both technical and social challenges.[6] Scaling up production to meet high demand remains a hurdle for many substances. While the technology is advancing, the ideal product is still one where a small amount commands a high price.

Another issue is the impact on traditional suppliers. Cacao, for example, is limited by geography and smallholder plantations. Precision fermentation is not yet cost (or taste) competitive with traditional methods, but as the biotechnology improves, traditional suppliers may be outpriced and outproduced. The biggest question is consumer acceptance. Will customers prioritize price and environmental benefits or be put off by biotechnology? Will they embrace innovation or stick to traditional ingredients? Producers and investors are watching closely, but only time will tell if these breakthrough technologies will pass the taste test.

Scalability is a particular concern. Many substances can be produced in labs at small scales, but producing them in large volumes in a short time can still be difficult. However, the ideal product from a business perspective is one where a small amount commands a high price.

Another issue is the impact on traditional suppliers when new technology enters the landscape. For example, cacao only grows in limited regions and is harvested mainly by hand on smallholder plantations. Precision fermentation to produce chocolate inputs is currently not cost or taste competitive, but biotechnologies become cheaper and better over time, sometimes exponentially. As prices drop and cross the "artisan cacao" threshold, traditional suppliers may be out-produced and under-priced. They will likely lack the capital or expertise to switch to lab-based biotechnology. Should they become tourist attractions or niche "natural product" players in their industries? Should we be thinking about programs to train these traditional farmers in the latest technologies so they can still bring their knowledge and expertise into the new industries?

The immediate question for these technologies is whether consumers will accept them. Will customers care more about environmental advantages and price or be put off by biotechnology? Will they embrace new innovation or revert to traditional methods? Could restrictive regulation or pushback from entrenched suppliers throttle these advances? Producers, investors and innovators are all watching early indications closely, but only time will truly tell whether these breakthrough technologies pass the taste test.

We have been living in a world where nature has placed limits on how we interact with scents, taste and aromas. We are undergoing a technological revolution allowing us to build and experience scents and tastes in ways we never have before, and perhaps never imagined possible. This is also happening as we inhabit more digital and virtual realities due with the increasing use of AI. These strides allow us to co-create and design those realities with ease and endless options at our fingertips and as new devices give us insight into our senses, brains, and nervous systems. Our current limit is only our imagination.

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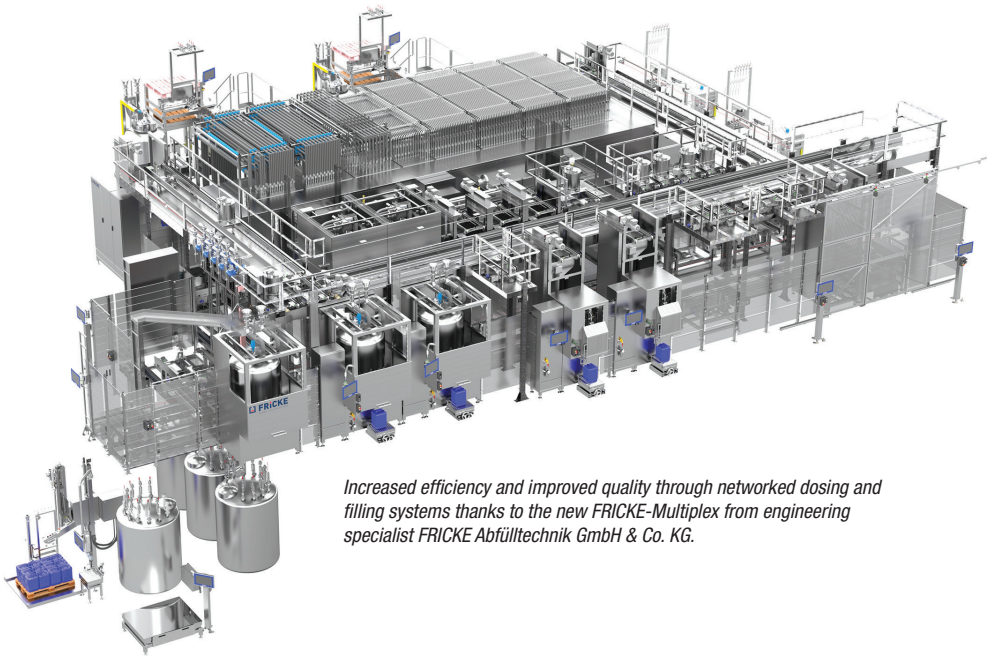
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Networked Dosing and Filling Systems Increase Efficiency and Quality

Automation technology for the perfume and flavor industry.

BY ACHIM RICHTER, Sales Director Dosing Technology, FRICKE Abfülltechnik GmbH & Co. KG



Increased efficiency and improved quality through networked dosing and filling systems thanks to the new FRICKE-Multiplex from engineering specialist FRICKE Abfülltechnik GmbH & Co. KG.



Achim Richter, Sales Director Dosing Technology, FRICKE Abfülltechnik GmbH & Co. KG

With networked production processes and the use of automated manufacturing systems, companies of all sizes—be they small, medium-sized or corporate—can increase their flexibility, minimize costs and increase profits. The FRICKE-Multiplex ensures precise dosing, controlled filling processes and batch traceability to ensure consistent product quality, formulation accuracy, compliance with quality standards and end-user safety.

The dosing and filling of perfumes and flavors often presents manufacturers with challenges in terms of efficiency, precision and quality. FRICKE Abfülltechnik GmbH & Co. KG, the mechanical engineering specialist from Minden, Germany, has developed an automated system in close cooperation with experts from various fields that enables efficient and precise dosing as well as reliable filling of perfumes and flavors. The focus was not only on increasing performance, but also on improving the working conditions for the employees. With the help of the innovative automated FRICKE-Multiplex system—which is protected by a utility model (DE 202023102541.2)—the efficiency, precision and quality of production processes can be raised to a new level. By using industry-specific software solutions (MES and BI systems), FRICKE enables smooth production processes, uniform machine control, comprehensive data evaluations and more freedom in order processing. From process analysis to commissioning, the company delivers a turnkey solution from a single source.

Increased Efficiency Through Intelligent Process Flow

The FRICKE-Multiplex system optimizes the entire production flow by linking the individual dosing and filling systems with each other. This enables a seamless and efficient transfer of the mobile FRICKE-Multiplex containers—which are also protected by a utility model (DE 202023102540.4)—from one station to the next. The intelligent process flow minimizes bottlenecks. Waiting times are minimized, which significantly increases overall productivity. In addition, the system reduces the need

for manual intervention, and makes the handling of aggressive and flammable chemicals safer.

The system ensures high product quality. Precise dosing and controlled filling processes guarantee that the individual perfume and flavor components are mixed in exactly the right quantities and ratios. Consistent quality and recipe accuracy are logged for compliance with quality standards and increase safety for the end consumer. With integration of all production processes like automatic and manual dispenses, mixing, filtration, filling, and cleaning a significant reduction in turnaround time for next day delivery is reached.



Liquids and powders are precisely dosed with FRICKE dosing systems for the perfume and flavor industry.

Increasing Flexibility and Adaptability

Thanks to the modular design, individual components of the plant can be easily exchanged or added to meet special production needs on an application-specific basis. This allows users to respond quickly to new market trends and customer requirements without having to make large investments in new production equipment. The plant is equipped with a container shuttle system that efficiently transports the mobile mixing tanks. The system controls stationary large tanks as well.

By integrating all process steps into an automated overall process, productivity was significantly increased. Precise dosing and filling with batch tracking and a mixing tank history with documented cleaning improves product quality. In addition, the high level of automation has a positive effect on the working conditions and employee satisfaction.

Potential for Further Applications and Industries

The FRICKE-Multiplex is a profitable future technology not only for the perfume and flavor industry, but also in other industries where dosing and filling in batch processes play a central role. It demonstrates the transformative potential of Smart Factory and enables companies to make their manufacturing processes smarter, increase flexibility, minimize costs and continuously improve quality.



FRICKE valve technology for high dosing accuracy and flow rate with reliable protection against cross contamination.

The Benefits of FRICKE-Multiplex

- **Efficiency Increase & Quality Improvement**: Optimized production flow, precise dosing, controlled filling, and batch traceability ensure consistent product quality and recipe accuracy.
- **Productivity Increase and Reduction in Turnaround Time:** Automated processes lead to higher productivity, especially in industries where dosing and filling play an important role.
- **Flexibility & Adaptability**: Modular design meets specific production needs and enables rapid adaptation from batch sizes small to large.
- **Secure Skilled Labor**: Reduction of manual and monotonous tasks improve working conditions through automated processes and increase employer attractiveness.
- **Product Individualization**: The integrated technology enables flexible product individualization according to customer requirements.
- **Process Safety & Automation**: Precise control and production monitoring ensures process sequences.
- **Transformation Process**: The FRICKE-Multiplex enables adaption to the digital era and opens up new business opportunities for long-term competitiveness and innovation.

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For more information on FRICKE systems, visit *https://www.frickedosing.com/en/fricke-multiplex.*

CLOVE OIL DERIVATIVES: THE CASE OF U.S. NATURAL VANILLIN AUTHENTICATION

Uncovering the nuances of vanillin sourcing and natural vanillin ex clove authentication.

BY LEO SENO BROTO, vice president of Research & Development Division, Indesso



Leo Seno Broto



Most of the vanillin in the market comes from chemical synthesis, with approximately 85% produced from Guaiacol (petrochemical products), while the rest are from lignin and eugenol.

Clove oil is an essential oil that can be derived into various aroma chemicals for flavor and fragrance ingredients.[1] The main components in clove oil are eugenol and caryophyllene, which could be synthesized into more than 15 derivatives such as isoeugenol, methyl isoeugenol, and vanillin.1 The latest synthesis technology uses sustainable innovation and green chemistry, such as a catalytic process for isoeugenol and dihydroeugenol, which have 100% atom economy, meaning all reagents are converted into the desired product without producing waste that pollutes the environment. The same thing happens in developing catalytic oxidation technology for the synthesis of vanillin made from eugenol, using green chemistry resulting in environmentally friendly and economical processes.

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Sources for Vanillin Production

Vanillin is an essential flavoring component widely used in food and beverages and the flavor and fragrance industries. The current trend for naturals has led to the rapid increase in demand for natural vanillin globally.

Vanillin can be produced from numerous sources such as petroleum origin (guaiacol), spruce tree lignin (coniferyl alcohol), corn sugar (glucose), rice bran (ferulic acid), vanilla beans (vanillin glucoside) and clove oil (eugenol).[2]

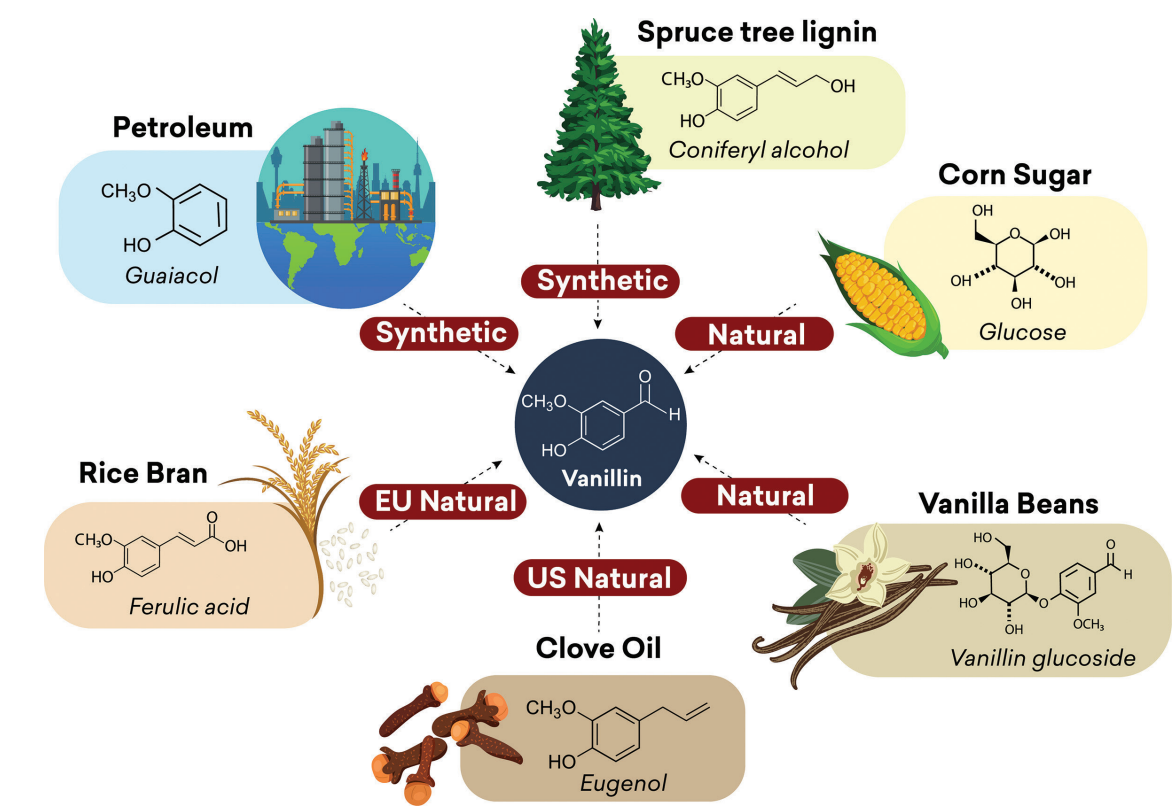
Natural Vanillin ex Clove Authentication

Most of the vanillin in the market comes from chemical synthesis, with approximately 85% produced from guaiacol (petrochemical products), while the rest are from lignin and eugenol. The difference in the starting raw materials for vanillin production affects the organoleptic profile, molecular fingerprint, regulatory product status, and the price of the resulting products. For example, vanillin from eugenol has a different sensory profile than vanillin from guaiacol and lignin. Vanillin ex clove is considered natural ingredient in the United States, while vanillin from guaiacol and lignin are considered as synthetic. Vanillin is also produced from ferulic acid to answer growing market for EU natural vanillin.[3]

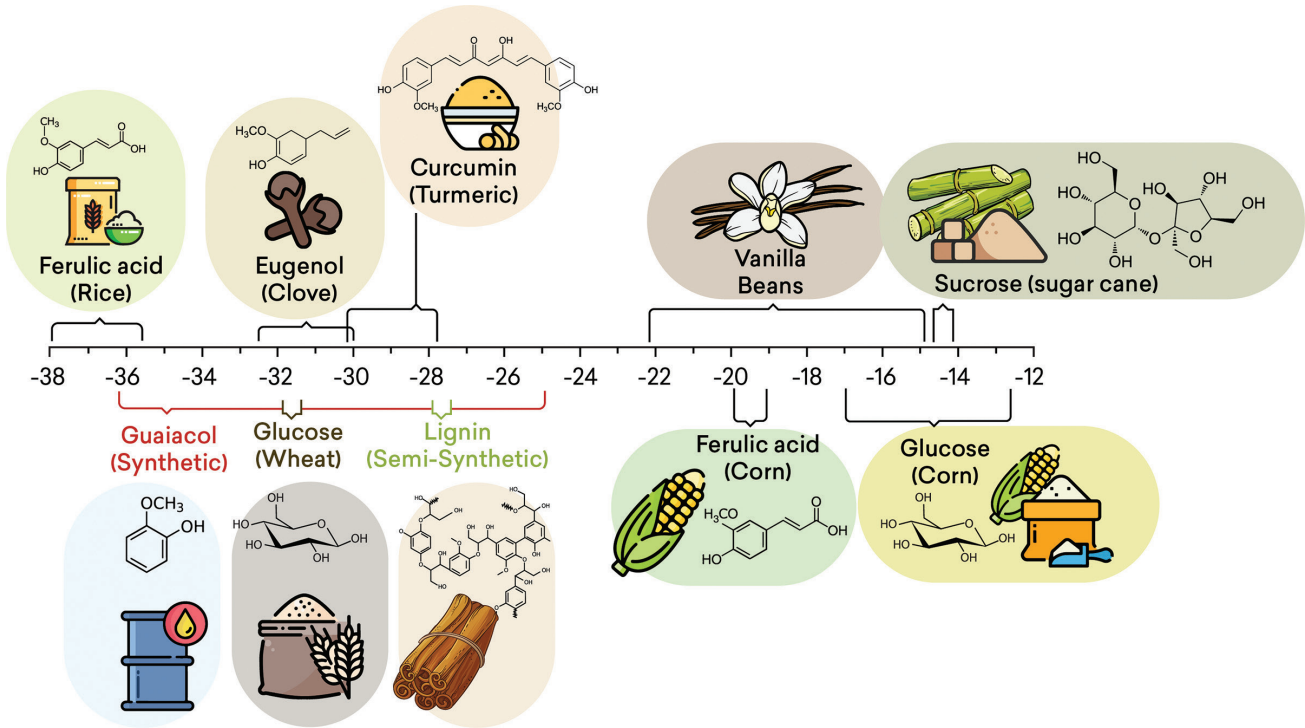
The difference in the price range of vanillin from the various raw materials mentioned above merits a reliable authentication method that can accurately determine the "authenticity" of the vanillin source, namely the use of Stable Isotope Ratio Analysis–Isotope Ratio Mass Spectrometry (SIRA-IRMS) and Site-Specific Natural Isotopic Fractionation by Nuclear Magnetic Resonance (SNIF-NMR).[3,4]

SIRA-IRMS is a method used to determine the authenticity of a molecule by measuring the abundance of stable isotope ratios for $^{13}C/^{12}C$, $^{18}O/^{16}O$, and $^{2}H/^{1}H$ of an element in a molecule that is specific to its geographic origin, type of plant photosynthesis, source of raw material, and the process path of synthesis of vanillin molecules. The origin of the vanillin raw material can be measured by the deviation value of the carbon ratio 13 ($\delta^{13}C$), which is the value between the ratio of ratio $^{13}C/^{12}C$ sample to $^{13}C/^{12}C$ standard and calculated using the formula $\delta^{13}C = [(^{13}C/^{12}C)\ \text{sample}/(^{13}C/^{12}C)\ \text{standard}) - 1\ ] \times 1000$.[3],

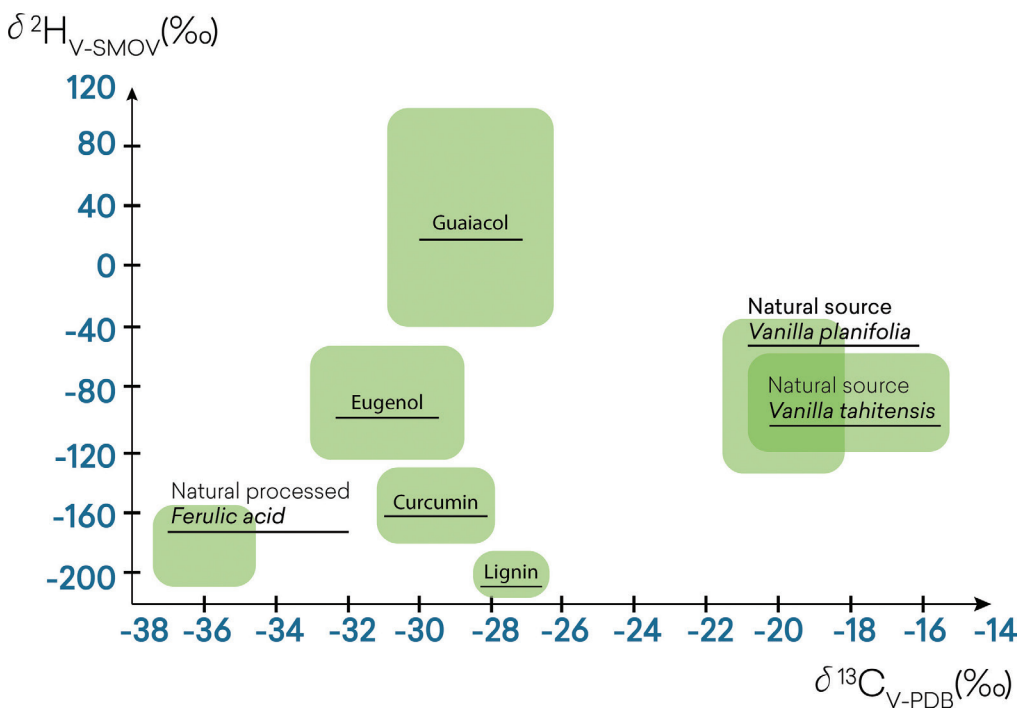
F-1 Various sources of vanillin starting raw materials[2]



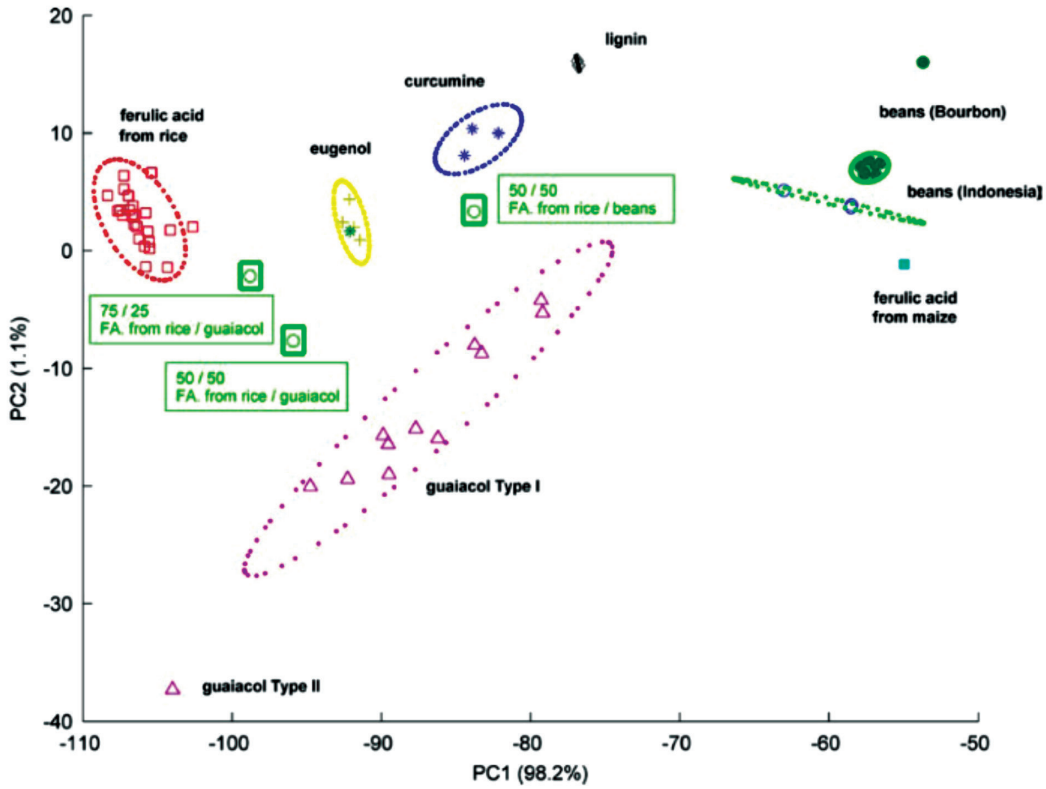
F-2 δ 13C range of values for vanillin according to a specific source and the chemical used as a precursor by SIRA IRMS[5]



F-3 Multielement IRMS range of value depending on the source of vanillin[4]



F-4 **Two-dimensional plot of the scores obtained by PCA on the values of the 13C isotopic composition for all eight sites obtained by SNIF-NMR[6]**



F-2 shows the results of IRMS measurements for Vanillin from various sources of raw materials.[5]

Isotope Ratio Mass Spectrometry analysis showed Vanillin authentication based on the ratio of stable isotope $^{13}C/^{12}C$ of various precursors such as petroleum and plants in various photosynthesis pathways (Calvin synthesis (C3 plants), Hatch-Slack pathway (C4 plants), or Crassulacean acid metabolic (CAM)), with different values as shown in figures [2,4,5] As seen in **F-2**, the δ ^{13}C range of values for vanillin ex clove is in the range of -32 – (-) 30, while synthetic vanillin from the guaiacol figure is in the range of -36 – (-)34, semi-synthetic vanillin from lignin falls in the range of -28.5 – 26.5.[5]

The addition of δ 2H isotope analysis on top of the δ ^{13}C as shown in **F-3**, aims to further improve



the accuracy of vanillin authentication. One of the disadvantages of only using the IRMS δ ^{13}C method is that it can be manipulated by the addition of cheaper materials that have an abundance of C-13 isotopes. This addition will cause the deviation value of carbon isotopes to shift positively toward natural vanillin from vanilla bean or the lower range of δ ^{13}C of vanillin sourced from other raw materials.[5,6]

The most accurate method in Vanillin authentication is SNIF-NMR, an analysis method that quantitatively measures the Nuclear Magnetic Resonance of deuterium (^{2}H NMR) and carbon-13 (^{13}C NMR). This method will give an abundance value that is specific to each element, namely eight carbon positions and five hydrogen positions in the Vanillin molecule, which depends on the origin of the vanillin precursor material, the plant origin of the Vanillin source, and the route of the Vanillin synthesis process used.[5,6] The ability of SNIF-NMR to determine the source of vanillin is shown in **F-4**, namely from the principle component analysis (PCA) graph. This method can clearly show the origin of the raw material for the same molecule, the geographical origin of the molecule, and the composition of the vanillin mixture. Sources of vanillin raw materials such as eugenol, guaiacol, lignin, ferulic acid from rice bran, ferulic acid from corn, and vanillin mixture made from the guaiacol-ferulic acid mixture can be distinguished significantly.[6]

Combination of the two analytical methods, SIRA-IRMS and SNIF NMR, accurately show the origin of the raw materials to the level of distinguishing the botanical sources used and the composition of natural and synthetic vanillin mixing, if any. The use of authentication technology is critical in guaranteeing the authenticity status of vanillin from fraud for consumers and economic sustainability for producers who entirely use the material in compliance with the regulatory status of vanillin.

Conclusion

Vanillin is a crucial material that is widely used in different applications. Assuring that the vanillin purchased is according to the regulatory claim made by the producer could be checked using these specific methods. It is of utmost importance to make sure of the authenticity of vanillin, such as vanillin ex. clove. This prevents further adulteration or mixing of synthetic vanillin into natural vanillin.

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On a 1-10 scale of the importance of scent, "scent in my bathtub products" received 9.3.



BY AMY MARKS-MCGEE,
Trendincite LLC; amy@trendincite.com

Forward Thinking: 5 Trends Shaping the Bath & Body Care Industry

Scent experiences, line extensions, collaborations, body sprays, and hand care are leading the way in bath and body care innovation.

Self-care has been on the rise and the pandemic has made it a staple. Consumers' mental health and well-being has led to an uptick in self-care rituals including bathing and showering. The latest trend taking over TikTok is the Everything Shower, which has three parts: pre-shower, shower and post-shower. As of August 17, 2023, the hashtag #everythingshower on TikTok[a] has garnered 295.2 million views. Furthermore, according to Vogue Business TikTok Trend Tracker[b] focused on its Gen Z user base, the TikTok hashtag #bodywash had 1.1 billion views and was a top trending tag for July 2023. In 2022, U.S. retail sales of body wash grew by an estimated 6% to $4.2 billion, while body care grew by 4% to $3.6 billion, according to Mintel[c].

[a] *https://www.tiktok.com/tag/everythingshower*
[b] *https://www.voguebusiness.com/fashion/the-vogue-business-tiktok-trend-tracker*
[c] *https://www.glossy.co/beauty/beauty-brands-battle-for-the-bougie-bathroom/*

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Scent experiences, line extensions, collaborations, body sprays, and hand care are leading the way in bath and body care innovation.

Scent is a powerful tool and an integral aspect of the bathing ritual. According to The Benchmarking Company's[d] research based on 3,800 U.S. women ages 18+, 78% of the respondents' bathtub products are fragranced and 79% of their shower products are fragranced. On a 1-10 scale of the importance of scent, "scent in my bathtub products" received 9.3. Women's post-bathing go-to products are body lotions (95%), body creams (68%), and body butters (50%). Interestingly, women switch scents often and for a variety of reasons. 65% change out scents on a regular basis, while 31% switch out shower scents each month and 22% change scents weekly. 72% switch scents on impulse after discovering a new scent in-store, 50% switch scents based on mood, 46% switch scents to match the season, 41% switch because they're bored with the usual, and 68% try to match bath/shower scents to post-bathing skin care scents.

1. Scent Experiences

As evidenced by the Benchmarking Company's research, fragrance is influential in consumers' bathing experiences and the products individuals use. Focused on self-care, brands are creating clean formulas and mood-enhancing scents to create pleasurable experiences for the shower and post-shower. Dial Soap released a new and improved line of its 15 Dial Body Wash products. The Body Wash products are formulated with the brand's new Hydraclean Complex solution, which includes vitamin E. In addition, the range is dermatologist tested, pH balanced, and free of parabens, phthalates, silicones, and sulfated surfactants. The ergonomically improved bottles are 100% PCR and certified by Cruelty Free International. Caress added three new scents to its Body Wash range: Refreshing Raspberry & Pink Pepper, Rejuvenating Mango & Almond Oil, and Soothing Aloe Vera & White Poppy. The launch coincided with a new package design across the portfolio. Tree Hut has extended its Tropic Glow product line with two new additions: Moonlight Glow and Ocean Glow. Moonlight Glow "is designed to balance your mood and your mind to soothe your skin and invigorate the senses," and is available exclusively online and in-store at Target. It is formulated with Snow Mushroom, Magnesium, and Amethyst and offered in Shea Sugar Scrub, Wellness Mist, and Whipped Body Butter. The scent contains notes of peach, orange zest, lavender, jasmine, amber, musk and coconut. Ocean Glow contains Hyaluronic acid, green microalgae, and rainbow algae "to immerse you in a sea of relaxation to help you feel mentally renewed and physically replenished," and is available exclusively online and in-store at Ulta Beauty. The fragrance features muguet, apricot, pastel sands, apple, coconut, pineapple, musk, amber and tropical sea accords. The line is available in Foaming Gel Wash, Shea Sugar Scrub and Whipped Body Butter.

Isle of Paradise unveiled two targeted body care collections: Brilliantly Bright and Confidently Clear, with sensorial textures and mood-boosting scents designed to invigorate the mind and body. Brilliantly Bright is formulated with a blend of

[d] *https://www.beautypackaging.com/contents/view_infographics/2023-05-12/bath-shower-and-body-care-trends/*



Moonlight Glow and Ocean Glow join Tropic Glow, one of Tree Hut's best-selling product lines; courtesy of Tree Hut.



Hairitage by Mindy McKnight has expanded into bath and body care with four aromatherapy scent combinations: Cedarwood & Neroli, Cherry & Amber, Mint & Yuzu, and Peony & Cypress; courtesy of Hairitage by Mindy McKnight.

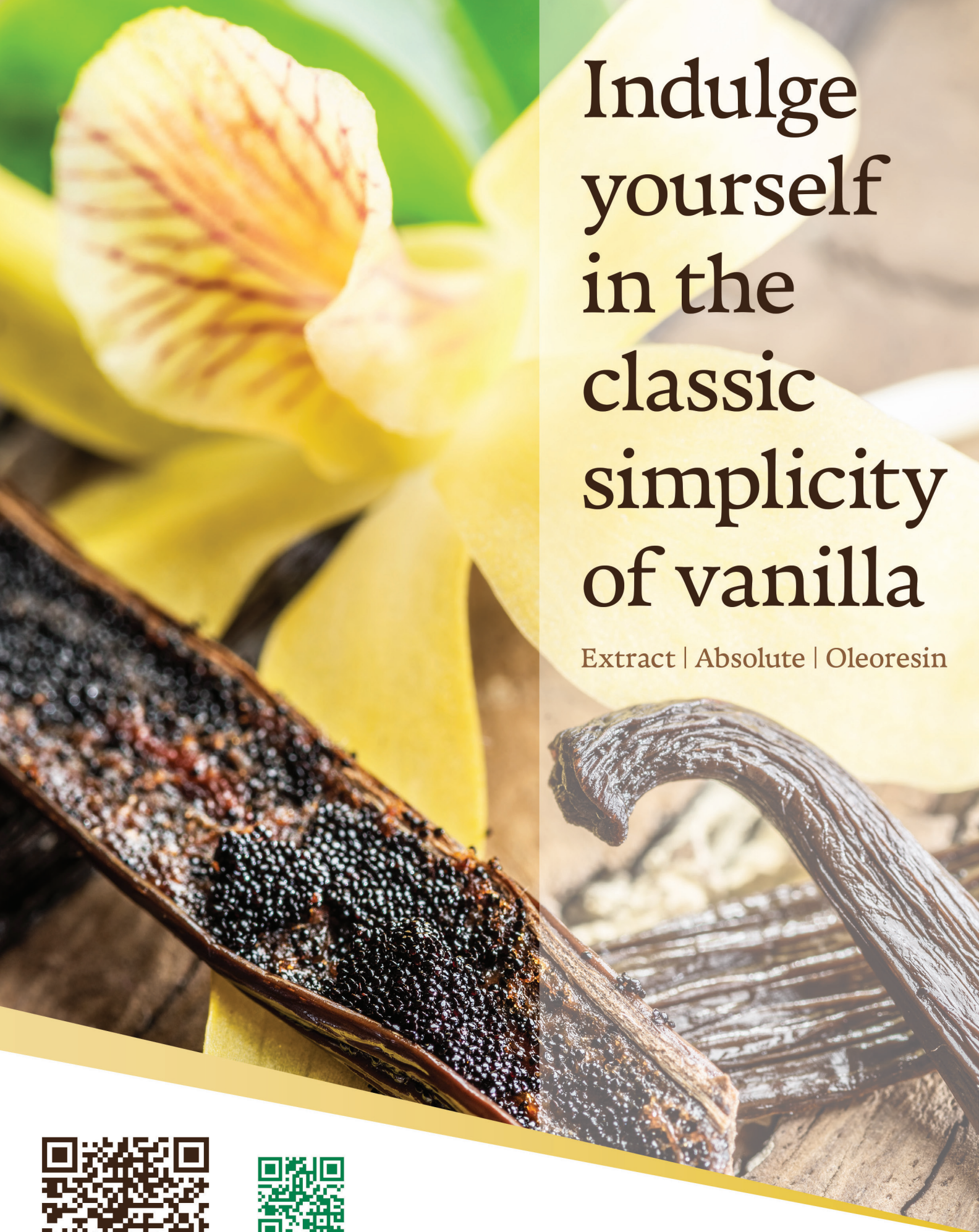
vitamin C, niacinamide and hyaluronic acid and an energy-boosting tropical scent with notes of sustainably and ethically sourced grapefruit, pineapple and jasmine. The Confidently Clear collection is made with a blend of lactic acid, polyglutamic acid, salicylic acid, and mandelic acid and a mood-enhancing scent of sustainably and ethically sourced orange and coffee. Both lines are offered in a Body Cleanser, Body Polish and Body Moisturizer. The Sprig Shower Infusion System is an interesting new product. It is a shower infusion device with scented infusion pods that "transform standard routines into amplified wellness rituals." The Essentials Collection features six infusion pods that use clean, natural, premium skin care ingredients such as hyaluronic acid and sodium PCA. Breathe is made with eucalyptus and mint, Focus contains clary sage and patchouli, Recharge features bergamot and lemongrass, Relax is infused with chamomile and green, Shield has tea tree and rosemary, and Sleep blends lavender and vanilla. Each pod is cruelty-free and free from parabens, mineral oils, sulfates SLS and SLES, phthalates and formaldehyde. The pods are made from 94% post-consumer recycled material and are designed to be recycled again. For the fall, Beloved by Love Beauty and Planet added Cashmere Wood and Sage to its Bath & Body collection. The line includes a vegan shower and bath gel, vegan body cream and a 2-wick candle.

2. Adjacent Categories Create Line Extensions

Brands that are in adjacent categories are creating line extensions and moving into the bath & body segment. Hairitage by Mindy McKnight launched a Bath and Body line in four aromatherapy scent combinations: Cedarwood & Neroli, Cherry & Amber, Mint & Yuzu, and Peony & Cypress. The clean formulas use naturally derived ingredients such as niacinamide, jojoba oil, aloe vera, and açaí fruit extract. The Now & Lather Body Wash features oat kernel and gotu kola extract, and It's A Dream Creamy Body Wash is enriched with açaí fruit extract and cupuaçu seed butter. The Sugar Coated Body Scrub contains ginger root extract and sweet almond oil, while the Day Off Bath Bombs are made with essential oils. Soak It In Body Lotion is formulated with niacinamide and jojoba oil, and Gimme Some Skin Whipped Body Cream is formulated with shea butter and coconut oil.

Scotch Porter has expanded beyond grooming with the launch of Hydrating Body Wash and Intense Anti-Dry Body Lotion. The body care products are available in Citrus and Crisp Woods, and Sandalwood and Tobacco Musk, the brand's signature scents, and are formulated with jojoba, moringa, and marula oil. Deodorant brand Wild and London-based design firm Morrama created a plastic-free and compostable refillable shower gel bottle made from potato starch waste from supermarket chips. The natural and vegan shower gels are available in Coconut & Vanilla, Fresh Cotton & Sea Salt, and Jasmine & Mandarin varieties. The Wild refills are made from 70% bamboo starch and 30% plant starch from agricultural waste and the pump is made from 50% post-consumer recycled plastic. Once the refill is empty, it can be composted.

H&M debuted OHH (Oh Hey Hero), a 10-piece vegan body care range, which includes body scrub, body wash, deodorant stick, hand cream, and shave gel. Two interesting products are Clear Up, Charlie, a fast-absorbing body serum to fight future breakouts on the chest, shoulders, and back, and Little Champ



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moisturizing stick with shea butter and sunflower oil to help prevent skin friction and lock in moisture. Prose has expanded into the skin care category with a three SKU, AI-powered skin care line designed to offer consumers a personalized formula backed by science. Users will be able to customize a cleanser, serum, and moisturizer with more than 15 million possible formula combinations that can target multiple skin concerns simultaneously. The skin care system also offers texture and fragrance customization, with a fragrance-free option.

3. There Is No Escaping Collaborations

There is no escaping collaborations; they are everywhere including bath and body care products. As discussed in Trendincite's *Perfumer & Flavorist+*[e] "Forward Thinking: 6 Trends and Innovations in Ambient Scent," article, which appeared in the September 2023 edition, pop culture continues to inspire partnerships. For body care, many of the collaborations are movie themed. Lush has been collaborating like crazy. According to Lush, "20% to 30% of all collaboration [sales] are new customers, which is one reason to do them ." Lush partnered with Paramount, a global ocean conservation, and Nickelodeon on the SpongeBob SquarePants: Operation Sea Change campaign and sustainability initiative. The co-created six product limited-edition collection features plastic free bath, shower, and skin care products with dreamy combinations of tropical, pineapple, and coconut scents. For example, the Krabby Bathy is a hybrid soap, bath bomb, and bubble bar. In conjunction with Wes Anderson's summer film Asteroid City, Lush crafted the Lush x Asteroid City bath collection. Lush x Asteroid City collection features four bath products: Asteroid Bath Bomb, Asteroid City Shower Gel, Doomsday Soap and UFO Shower Jelly. There's an onslaught of Barbie collaborations and Lush joined the bandwagon. The Lush 11-piece Barbie themed collection includes pre- and post-shower products such as bath bombs, bubble bars, body balm, jelly masks, and soaps. The Barbie B fizzer is bright pink and white filled with nourishing coconut cream and shea butter while the Barbie Boombox and Barbie Handbag soaps feature a rhubarb and custard candy fragrance.

Collaborations are also happening in face care and deodorant. For example, Beekman1802 partnered with Mrs. Potato Head to create an at-home gentle facial peel formulated with goat milk, potato pulp, 10% lactic and lactobionic acid, and 15% glycolic acid. In June, Fussy, the refillable deodorant brand, and craft beer maker BrewDog, released the Fussy x BrewDog Beer-odorant. The Punk IPA-inspired natural roll-on deodorant has notes of hops, pineapple, and grapefruit. It is vegan, cruelty free, and housed in a plastic-free compostable refillable package.

[e]*https://perfumerflavorist.texterity.com/perfumerflavorist/september_2023*



Barbie x Lush Collaboration features an 11-piece Barbie themed collection that includes pre- and post-shower products such as bath bombs, bubble bars, body balm, jelly masks, and soaps; courtesy of Lush Cosmetics.

4. Body Sprays Make a Comeback

Driven by the nostalgic trend and a throwback to the '90s, body sprays are making a comeback. According to The Benchmarking Company's data, 54% of women use body sprays as a post-bathing product. Summer was the "it" season for new launches with warm, beachy scents. Ellis Brooklyn launched a trio of body mists in Sand, Sea and Sun scents. Marketed as a clean and natural brand, Sand has an 86% biodegradable formulation, Sea consists of 35.56% natural origin ingredients and 29.17% of the ingredients are renewable, and Sun is formulated with 30.4% upcycled ingredients. For Summer 2023, Sol de Janeiro released a limited-edition trio: Bikini Season, Do Not Disturb, and When in Rio Perfume Mists. Bikini Season is a tropical, sweet fruity gourmand scent with guava nectar, sunlit orchid, and coconut water while Don Not Disturb is a warm, spicy floral musk with mimosa flower, musk, warm sand, and sun-washed linen accords. When in Rio is a warm floral amber with notes of vanilla, amber, bergamot, pear and jasmine. Saltair added Fine Fragrance Body Mists to its growing portfolio in three of its most popular scents: Pacific Pear, Pink Beach, and Santal Bloom. According to founder Iskra Lawrence, "[Body mists] are our number-one requested product. It's such a beautiful, low-maintenance, lightweight way to smell good all day ." Pacific Pear highlights juicy



Spurred by customer demand, Trapp Fragrances entered the hand care market with hand soaps and lotions in the brand's most popular scents: Orange Vanilla, Lavender de Provence, and Palo Santo; courtesy of Trapp Fragrances.

notes of orange and pear with jasmine, orris, and a sandalwood base while Pink Beach features a creamy, coconut, and vanilla scent with lily and orange zest. Santal Bloom has notes of cardamom and magnolia followed by jasmine, amber, and sandalwood. In the spring, Panama Jack introduced four unsex tropical-inspired body mists in Crashing Waves, Salty Air, Seashore and Summer fragrances. The scents were designed to "radiate that beach feeling and allow the wearer to feel as if they are strolling along the water's edge in their own personal oasis."

5. Hands Over Fist

Frequent handwashing and the use of hand sanitizers are key factors in the growth of hand cream and lotion. The global hand cream and hand lotion market is expected to reach $10.49 billion by 2027 growing at a CAGR of 10.2%, according to The Business Research Company[f]. According to the Benchmarking Company, 70% of women reach for hand creams after their bath or shower. Like other beauty care segments, line extensions and clean formulas are appearing in hand care products. For example, hair care brand Amika has launched a new hand wash infused with sea buckthorn berry. The hand wash features the brand's signature scent with notes of grapefruit, orchid, rose, vanilla, and sandalwood. Baylis & Harding introduced Kindness+, "a value-centered, clean beauty brand combining scientifically proven ingredients with 98% naturally derived formulas," sold at Target. The range includes two plant-based hand cleansers that are biodegradable, dye-free, paraben-free, silicone-free, and sulfate-/SLS-free and packaged in 100% recycled PCR plastic bottles. The Cleanse & Hydrate Hand Wash (Apple scent) is formulated with hyaluronic acid, allantoin, and provitamin B5 while the Cleanse & Glowing Hand Wash (Macadamia scent) is fortified with vitamin C, niacinamide, and provitamin B5. Spurred by customer demand, home fragrance brand Trapp Fragrances entered the hand care market with hand soaps and lotions. Trapp debuted the brand's three most popular fragrances: No. 04 Orange Vanilla, No. 25 Lavender de Provence, and No. 77 Palo Santo in these applications. The products are cruelty-free, paraben-free, phthalate-free, and SLS-free. The hand soaps are made with aloe vera, and the lotions are formulated with cupuaçu seed butter and oat bran extract.

Conclusion

Self-care and bathing rituals with fragrances designed to enhance moods are driving consumer interest and usage of bath and body products. From head to toe, consumers enjoy scent experiences with scented bath and body products. Clean formulas, plant-based ingredients and sustainable packaging are evident. To engage consumers, brands in adjacent categories are creating line extensions and limited-edition collaborations. Body sprays are making a comeback and hand cream and lotions with functional ingredients are hitting shelves. Watch as functional ingredients and scents drive bath and body care innovation.

[f] *https://www.thebusinessresearchcompany.com/report/hand-cream-and-hand-lotions-global-market-report*

BatchMetrics Celebrates 25 Years Targeting F&F Plant Efficiency

iniTECH CEO Rich DiBernardo connects to discuss the nuances of new and evolved technologies designed specifically for F&F.

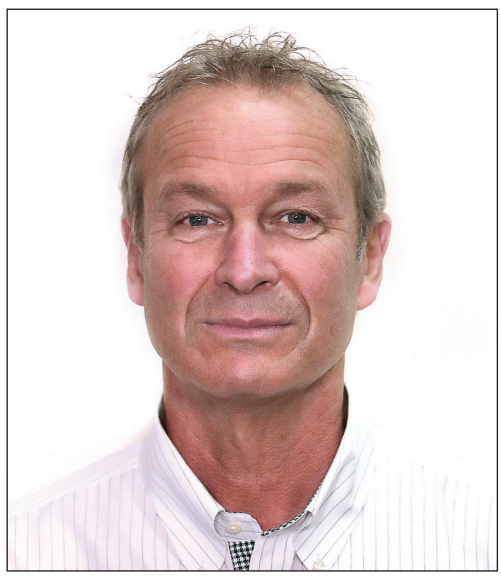
This year marks the 25th anniversary of Lecron's BatchMetrics software development. BatchMetrics is a fully-operational manufacturing execution system designed for ultimate efficiency throughout any F&F company's chain of command.

Perfumer & Flavorist+ (*P&F+*) connected with CEO Rich DiBernardo to discuss the nuances of BatchMetrics' software, the nuances of the company's latest artificial intelligence (AI) tool that caters to F&F plants as well as iniTECH's partnership with Princeton University.

***P&F+*: Congratulations on 25 years of BatchMetrics software. That's incredible longevity for a software product. Can you share a bit about it and its evolution over the past quarter century?**

Rich DiBernardo [RD]: Unlike many companies that start out with a specific goal in mind, BatchMetrics is a customer demand driven product. It evolved from the need to connect the ERP (SAP in our first project) to Process Control System running HMI (Human Machine Interface) and the PLC (Programmable Logic Controller).

It was an exciting time in technology innovation and we kept expanding our functionality to connect



iniTECH CEO Rich DiBernardo shares insights into the company's longevity and upcoming projects.



the various systems in manufacturing into a single seamless solution. No more manual entries, errors and gaps in information collection for traceability.

Electronic Weight Control for compounding was our cornerstone, but being customer focused and having them demand more, we expanded functionality to support Packing/Filling, Compliance (HACCP), Equipment Tracking, Mixing and Post Processing. We later expanded into Wearhouse Management, Quality Control, Shipping and Receiving. Throughout all of this growth, we remained user-centric, with simple to use screens and process related functions.

Lecron never relinquished their roots and maintain presence in Automation space, where they provide fully integrated solution for Automated Dispensing, Reactions and Spray Dryers.

> BatchMetrics is a fully-operational manufacturing execution system that makes everybody's job–from the compounder to the finite scheduler to the CEO–easier, more efficient and interlinked.

Today, BatchMetrics is a fully-operational manufacturing execution system that makes everybody's job–from the compounder to the finite scheduler to the CEO–easier, more efficient and interlinked. We have implemented hundreds of systems across the globe and are proud to work alongside 8 of the top 10 companies in the F&F marketplace–touching over 50% of the F&F products made worldwide.

***P&F+*: A lot of people know iniTECH for BatchMetrics software, but you are a full-service engineering design firm, and we hear you have a new AI tool to help F&F companies when it comes to designing their plants. What does that software entail?**

RD: We are a lean-centric engineering firm that designs factories, so every decision made puts our plants a step closer to being as efficient as possible. Our approach is time-tested and real-world proven, as we have deployed hundreds of projects globally, reaping quantifiable results of productivity.

A lot of our competition is a bit more generalist, whereas we have been hyper-focused for over two decades on on the F&F landscape alone. Because of this we know the equipment, the players, the pitfalls, the granular details of the landscape. Twenty-five years of repeated exposure has helped us quantify the results of countless combinations of equipment, systems, and integrations–and allows us to pool this data as one massive resource.

Now, we are harnessing the power of artificial intelligence with iniTECH AI, which is able to ingest a quarter century of information and experience, in order to offer cutting-edge solutions based on our expert proprietary data. For example, our mammoth library of 3D components is partnered with iniTECH AI, in order to scrutinize past projects and build high-end 3D models of new plants accordingly; these models are helpful for many reasons, often exposing issues that would arise down the road after physical ground is broken.

***P&F+*: In other news, iniTECH has announced a partnership with Princeton University on a new way for the F&F industry to measure flow. Can you share more about this project with our readers?**

RD: We are extremely excited about this new partnership. The team from Princeton and Tendo is highly innovative, having developed a number of revolutionary new tools that we think will change the face of manufacturing going forward. As you mentioned, they're working on a new mass flow meter and it has yielded some very impressive results so far. This technology is significantly less expensive than its alternatives, and will help in reducing the batch cycle time.

Additionally, they are developing groundbreaking level technology, which can work wirelessly and accurately to read liquid levels through steel and through air. This means the level no longer needs to be installed on the inside of a container and is less expensive than the existing alternatives.

Finally, they have made some very exciting headway into building a new benchtop robot, which is both smaller and more cost-effective than the current marketplace options. Best of all, this robot can execute simultaneous pours of raw materials, making it extremely efficient.

Exploring Evolving Consumer Tastes in Modern Confectionery

Discover the latest market research in consumer trends and recent innovative launches in the space.



While traditional flavors are still popular among consumers, confectioners continue to experiment with bold flavor profiles that appeal to consumers that would like to be more experimental.

BY JOHN POWERS, marketing director, Snacking and Baked Goods, ADM

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John Powers

Across food and beverage sectors, consumers' tastes and preferences are constantly evolving, and the confectionery industry is no exception. Modern consumers not only seek delightful flavors, but also innovative and unique experiences when it comes to indulging their sweet tooth. As a result, confectionery manufacturers are continuously adapting to these changing preferences, creating a fascinating landscape of diverse and intriguing offerings.

Bold, Exotic and Nostalgic Flavors

The confectionery space lends itself well to innovative and inventive flavor profiles, combining the exotic with the traditional. As many consumers view confectionery as a treat or reward, sensory appeal and flavor are important attributes when choosing which products to purchase, prompting brands to elevate their offerings with flavors that help consumers satisfy their cravings. From novel and nostalgic to traditional and bold, consumers want flavor experiences that engage their senses and spark their imaginations.

When considering confectionery choices, specifically for chocolate products, consumers in North America find flavors like chocolate hazelnut (96%), caramel (94%), vanilla (90%) and biscuit/cookie (87%) as most appealing[a]. At the same time, 76% of North American consumers enjoy traditional and nostalgic flavors that remind them of simpler times, with 73% saying such flavors offer moments of comfort and escapism[b]. Flavors like lavender, with complementary notes of vanilla, chocolate, caramel and honey, are helping to create these moments of comfort, evoking feelings of relaxation and warmth.

The use of flavors derived from natural sources, such as botanicals, is also on the rise, elevating the taste appeal and premiumization of confections. In the right combinations, botanicals give consumers a range of herbal, earthy, floral, sweet, spicy and citrusy options, from tart pomegranate to floral hibiscus to sweet lychee and more in hard candies and chews. Ever-popular mint is also delivering refreshing notes and invigorating flavor combinations with ube, coconut, citrus and cinnamon.

While traditional flavors are still popular among consumers, confectioners continue to experiment with bold flavor profiles that appeal to consumers that would like to be more experimental. In fact, 81% of North

[a]FMCG Gurus, Chocolate and Confectionery Trends in North America, 2022

[b]FMCG Gurus, Flavor, Color & Texture Trends in North America, Regional Report, 2023

American consumers noted they like to try new flavors from around the world, and 78% of North American consumers also agree with the statement, "I like food and drink products with new and unusual/exotic flavors." This flavor exploration not only caters to the adventurous consumer but also introduces new and exciting taste sensations to a wider audience.

Consumers are now seeking confectionery experiences that transport them to different cultures and delight their taste buds with unexpected combinations, thereby broadening their culinary horizons.

From lavender-infused chocolates to chili-spiked caramels and matcha-flavored gummies, the modern confectionery landscape offers a tantalizing array of flavors. Manufacturers are also experimenting with unconventional ingredients like sea salt, rosemary, and bacon, pushing the boundaries of traditional confectionery and offering unexpected taste experiences. Regional spices like cardamom and garam masala are finding their way into chocolates, adding a surprising twist to familiar treats. Plus, fruits such as mango, passionfruit and yuzu are also making their mark, providing fresh and tangy flavors to confectionery creations.

Confections are the perfect offering for flavor experimentation, with consumers willing to try something new in the form of a quick bite. Limited edition flavors play well here, with the ability to encapsulate even the most whimsical of flavor profiles, such as that of unicorns or fairies. Interestingly, "limited edition" is among the top five fastest growing year-over-year food and beverage claims[c], showcasing the potential for more limited-time offerings (LTOs) in the candy aisle.



Chocolate bars are seeing inclusions of the salty notes from potato chips, as well as sesame, Thai ginger and creamy avocado.

Fun and Functional Formats

Many consumers consider indulgence as an important part of supporting their holistic well-being, and they are continually looking for ways to satisfy their desire for a sweet treat. From hard candies, caramels and gummies to chocolate bars, confectionery can be a great category for brands to play with traditional and emerging formats that deliver on taste, quality and function.

Gummies are at the forefront of innovation, as they continue to demonstrate an ongoing convergence of foods and dietary supplements–bridging the gap between fun and functional, while also incorporating trending ingredients, including dietary fiber, probiotics, antioxidants, and vitamins and minerals. New gummy developments are also moving away from artificial fruit flavors toward more sophisticated notes and natural ingredients. For instance, emerging now are gummies infused with botanicals such as elderflower, hibiscus and lavender, as well as gummies bursting with real fruit juices from finger limes and tangerines.

Classic formats like hard candies, caramels and chocolate bars are also coming to the fore with new and unique flavor profiles, as artisanal brands capitalize on consumers' increased sense of adventure and experimentation. Flavor notes of pineapple habanero and sour apple pie are appearing in hard candies; and infusions of coffee, cinnamon, chili and coconut are making their way into caramels. Chocolate bars are seeing inclusions of the salty notes from potato chips, as well as sesame, Thai ginger and creamy avocado. Popping candy and crunchy quinoa are also adding thrilling textural elements to chocolate bars. Additionally, product developers are moving toward creating more sugar-free or reduced-sugar hard candies, caramels and chocolate bars, as sugar reduction continues to be a heightened focus for many consumers.

Confections are also being reinvented and redefined in the "better-for-you" space. More wholesome ingredients are being incorporated, including chia, flax, hemp and pumpkin seeds. At the same time, added functional ingredients appeal to

[c]Mintel, GNPD, Global, Food & Beverage, 2022


Ennarom
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New gummy developments are moving away from artificial fruit flavors toward more sophisticated notes and natural ingredients.

health-conscious consumers, with research showing that 52% of North American consumers find claims like "high in protein" as influential when purchasing confectionery products. With the shift towards alternative and added functional ingredients, brands are leveraging new and traditional formats to make "better-for-you" options that much more appealing for consumers.

Confectionery Technical Considerations

Developing eye-catching and delicious confections doesn't come without its formulation challenges. It's important for brands to consider all aspects of the formulation process from start to finish in order to deliver consumer-preferred confectionery. Such challenges include heat, stability, solubility, packaging, shelf life, taste and color interactions.

Ingredients derived from natural sources and other functional ingredients, for example, may impact the overall taste and texture of a finished product. When creating confections that are low in sugar or fat, or high in protein or fiber, manufacturers must still ensure indulgence and flavor expectations are met. An addition of protein or fiber, for example, may produce undesirable flavor notes and aromas or gritty textures. The lack of sugar may impact the structure of certain confections like jellies and gummies. Taste modulation technologies and quality plant proteins, fiber solutions and sweeteners can support product developers in overcoming these sensory hurdles.

At the same time, visual appeal influences overall flavor and taste appeal. Industry-wide confectioners are seeing a shift from artificial and synthetic color sources to those derived from natural sources, as consumers increasingly examine product labels for ingredients they deem to be "closer-to-nature." However, while certain plants, botanicals, fruits and vegetables are desirable, they can be affected by challenging processing conditions that may impact the intensity and stability of certain colors. Cutting-edge technologies, such as micronization technology and emulsion solutions, are key to supporting the development of visually striking confections made with ingredients from natural sources, ultimately capturing discerning shoppers' attentions.

Evolving consumer tastes have sparked increased innovation within the confectionery space, challenging brands to think outside the box to create flavorful confectionery and candies. From incorporating indulgent and exploratory flavors, building new formats and leveraging technical prowess, confectionery brands can deliver novel developments with the help of a collaborative and global partner that has an expansive portfolio of solutions and ingredients together with formulation knowledge to create craveable and captivating confections.



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What's on the *Flavorcon* 2023 Menu

View the session line-up, speaker roster and what's on the menu at the upcoming event.

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



Flavorcon's bustling expo hall showcases the latest ingredients, technologies and products the industry has to offer.

It is time to talk about all things flavor! *Flavorcon* 2023 is right around the corner. Scheduled for November 8-9 in Cincinnati, Ohio, at the Duke Energy Convention Center, attendees can expect conference sessions aimed at investing in Flavor's Fruitful Future. Not to mention a bustling expo hall showcasing the latest ingredients, technologies and products the industry has to offer.

Are you ready for this action-packed event? There are also events scheduled on November 7. You can arrive in Cincinnati early to partake in the Flavorist Master Class hosted by "Flavor Reports" column moderator Cyndie Lipka (Bell Flavors & Fragrances) and "Flavor Bites" columnist John Wright. Not to mention a karaoke networking event at Tokyo Kitty hosted by Women in Flavor and Fragrance Commerce.

Don't have your ticket yet? No sweat, registration is still open. Visit *www.flavorcon.com* to secure your spot.

>>There's still time to register.<<

*Registration for the WFFC Tokyo Kitty event is through *wffc.org*.

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Just in case you've missed our announcements regarding the session line-up, here's a quick recap of what's on the menu at this year's event. Many of this year's speakers plan to present with samples, so be sure to prep your palate. Visit *www.flavorcon.com* to view all speaker bios and session details.

Wednesday, November 8

- **"Mouthfeel: The Next Frontier in Flavor Perception"** with senior research fellow at Monell Chemical Senses Center, Linda Flammer, Ph.D.
- **"Filtering Flavors – The Back to Basics for Achieving Sustainability in Your Process"** with technical specialist, Global Technical Services, Food & Beverage at Pall Corporation, Marina Ferreira.
- **"How to Apply Taste and Smell Neuroscience to Create Taste Modulators"** with CEO at W2O Food Innovation, Alex Woo.
- **"The Current State of Flavor Creation and How We Can Improve It"** with CEO at Intellex, Jason McCaw, alongside scientist, inventor and business owner at Fields of Gold Consulting LLC, Steve Leusner.
- **"New Upcycling Technology Results in Stable Supply of Circular Fatty Acids"** with commercial manager at ChainCraft, Jeroen van Dorp.
- **"The Harmony of Taste from the 18th Century Perspective"** with principal flavorist at McCormick + Company Inc., Sam Tharpe.
- **"Dry Rubs and Modern BBQ Flavors"** author, expert judge, BBQ Hall of Famer, Ray Lampe, aka Dr. BBQ.



On Day 2 (November 9) Kroger senior innovation manager Natalie Taake's session will provide actionable steps to attendees on how to better work with their sensory partners.



The Flavorcon expo hall showcases the latest ingredients, technologies and products the industry has to offer.

- **"Best Practices for Mentoring Flavor Chemists"** with moderator Marie Wright (ADM) and panelists Katie Crowley (ADM), Richard Dandrea (Robertet) and Alpa Roman (Lucta).

"The Trick to Dealcoholizing Wine Without Compromising Flavor" with flavor chemist at Surely Wines, Michael Colangelo.

Thursday, November 9

- **"Plant-based Market Trends in the Food Industry"** with senior research analyst at Euromonitor, Miri Eliyahu, Ph.D..
- **"Trending Ingredients and Flavors in the Snack Market"** with co-founder and CEO at Spate, Olivier Zimmer.
- **"Formulating for Sports Nutrition and Dietary Supplements"** with lead R&D technician at Catalyst Nutraceuticals, Felicite Woods.
- **"Evolving Trends and Consumer Demands in The Ice Cream Market"** with director of Research and Development John Bloch.
- **"Confessions of a Former Sensory Scientist"** with senior innovation manager at Kroger, Natalie Taake.
- **"How to Brew: Empowering Flavorists"** with brewmaster and certified cicerone Stephen Rich.

Visit *www.flavorcon.com* to save your seat! Attendees can also purchase tickets the day of the event at the door.

Perfumer & Flavorist+ Unveils 2024 Themes

Want to expand your brand awareness through an upcoming issue of *P&F+*? Interested in contributing? Take a look!



P&F+ unites the F&F industry through our events and print and digital platforms. Let us connect you with our global audience of decision-makers.

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The global flavors and fragrances market size was valued at $26.54 billion in 2022 and is projected to grow to $36.49 billion by 2029, exhibiting a compound growth rate of 4.7% during the forecast period, according to a report by Fortune Business Insights[a].

With the advances in ingredient and formulation technology, shifting consumer demands and regulatory updates, the community fosters such growth by staying up-to-date with the latest trends, studies and insights from F&F's top minds.

Perfumer & Flavorist+ (*P&F*+) is the global knowledge resource for the entire F&F supply chain, including perfumers and flavorists, R&D leaders and product developers. *P&F*+ provides the latest updates on ingredients; science and technology; applications and formulations; market and consumer insights; and trends.

P&F+ unites the F&F industry through our events and print and digital platforms. Let us connect you with our global audience of decision-makers.

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Suppliers: have innovative new ingredients, technology, equipment or services we should be covering?

F&F Experts: have any insights you'd like to share or hear about?

Reach out to our content director to submit launches and news for consideration.

Suppliers and service providers: Want to connect with *Perfumer & Flavorist*'s 30,000+ dedicated multi-channel audience of flavor and fragrance professionals and key decision-makers? Or our highly engaged 30,000+ LinkedIn community? Reach out to our associate publisher, Paige Crist, to learn more about cross-platform marketing, editorial and engagement opportunities.

[a]*https://www.fortunebusinessinsights.com/flavors-and-fragrances-market-102329*

P&F+'s 2024 Monthly Editorial Themes

January

ENHANCERS, REDUCERS & REPLACERS
- Sugar Alternatives
- Fat Reducers
- Salt Reducers

SCENT & WELL-BEING
- Emotional & Wellness Benefits of Scent

Industry Insights: Taste & Mouthfeel Enrichment and Enhancement / Carbon Zero Supply Chain / Taste Modulation

Editorial deadline: 10/06/23

February

WELLNESS & CLEAN LABEL
- Multi-Functional Ingredients
- Packaging for F&F
- Nutritional Ingredients
- Cosmetic Ingredients

COFFEE & TEA
- RTD Coffees and Teas

Industry Insights: Functional Ingredient Technology / Sustainable Ingredients

Editorial deadline: 11/03/23

March

F&F TECHNOLOGY & PERFORMANCE
- Spotlight on Innovative Biotech F&F Ingredients
- Delivery Systems & Encapsulation
- Carriers, Solvents & Fixatives
- Latest in Packaging & Equipment
- Synthetics & New Molecules

REGULATORY LANDSCAPE UPDATES

Industry Insights: Biotech in F&F, Renewable Ingredients, Upcycling & Byproducts, Green Chemistry / Manufacturing, Lab Tech & Robotics / Synthetics & New Molecules

Editorial deadline: 12/01/23

April

NATURALS
- Extracts
- Testing, Analysis & Authentication
- Essential Oils
- New Naturals with Unique Benefits: Sourcing Strategies, Extraction Techniques

Industry Insights: Traceability & Provenance / Organics

Editorial deadline: 01/05/24

May

MINT & SPICES
- Spice Production, Applications & Technology
- Trigeminal Stimulants
- Botanicals

MINT
- Mint & Oral Care Innovations

TOBACCO
- Flavoring for Tobacco Products

Industry Insights: Heating & Cooling Technologies / Mint & Menthol

Editorial deadline: 2/02/24

June

FRAGRANCE INNOVATIONS
- Global Category Sales
- Key Trends & Launches
- Innovative Technologies to Improve Fragrance Systems
- Supplier/Brand Relations, Fair Trade Sourcing

Industry Insights: New Fragrance Ingredient and Tech Launches at *World Perfumery Congress*

Editorial deadline: 03/08/24

July

LEADERBOARD: TOP F&F COMPANIES
- In-depth Interviews and Profiles from the Leaders of Top Flavor & Fragrance Companies

REGIONAL LEADERS
- Insights from Top Companies in their Respective Areas

Industry Insights: "Free-from" F&F Ingredients (Allergen-free, Vegan, Non-GMO, Plant-based, Gluten-free / Dairy), Dairy Alternatives / Certifications

Editorial deadline: 04/05/24

August

FINE FRAGRANCE
- Fine Fragrance Market & Innovations
- Fragrance Brands Disrupting the Space

BEVERAGES
- RTD Beverage Innovations
- Beverage Launches & Technologies
- Flavor Modifiers
- Low & No Alcohol Flavors
- Flavoring for Wine, Beer & Spirits

Industry Insights: Naturals, Synthetic & Sustainable Ingredients / Beverage Technologies & Innovations

Editorial deadline: 05/03/24

Hosted by perfumer & flavorist

WPC

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The Sensory Event for Fragrance Leaders

World Perfumery Congress

June 25-27, 2024

Palexpo | Geneva, Switzerland

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Resign and Receive This Year's Rates





The October 2024 issue tackles confectionery! See white space in the market? Weigh in by pitching an article.

September

AIR CARE & CANDLES
- Air Care Market Data
- Masking & Odor Elimination
- Trends & Launches
- Technological Innovations in Delivery Systems & Performance

SNACKS
- Snacks Market Data
- Limited Time Offer (LTO) Flavors
- Trends & Launches
- Technological Innovations in Snack Applications

Industry Insights: Salt Enhancers / Delivery Systems / Odor Elimination & Masking

Editorial deadline: 06/07/24

October

PERSONAL CARE
- Fragrancing for Cosmetics
- Personal Care Fragrance Labeling

CONFECTIONERY
- Sugar Reduction
- Vanilla & Vanillin
- Sugar Alternatives
- Flavoring for Marijuana Infused Products

Industry Insights: Vanilla / Sweeteners / Clean & Allergen-free

Editorial deadline: 07/05/24

November

SAVORY
- High Impact Aroma Molecules
- Savory Solutions
- Vegan Ingredients & Alternatives
- Flavoring Alternative Proteins

HOME CARE & CLEANING PRODUCTS
- Trends & New Launches
- Labeling & Regulations

Industry Insights: Umami, Kokumi & Savory Solutions / Malodor Tech & Abatement

Editorial deadline: 08/02/24

December

CITRUS
- **Solubility** & Stability Solutions
- Regional Citrus Varieties
- Citrus Ingredients
- Citrus Market Report
- Superfood Flavors

Industry Insights: Citrus Ingredients / Citrus Solutions, Blends & Enhancers

p&f+

Look Who's Talking at *Flavorcon* 2023

November 7 - Pre-*Flavorcon* Masterclass

(FMCG/Flavorist full conference registration required to register. Additional fee required.)



Cyndie Lipka
Principal Flavorist at Bell Flavors & Fragrances



John Wright
Independent Flavorist

November 8-9



Linda Flammer, Ph.D.
Senior Research Fellow at Monell Chemical Senses Center



Ray Lampe
Author, Expert Judge, BBQ Hall of Famer at Dr. BBQ



Miri Eliyahu, Ph.D.
Senior Research Analyst at Euromonitor



Marina Ferreira
Technical Specialist, Global Technical Services, Food & Beverage at Pall Corporation



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



Molly Strausbaugh
Assistant Director, Content Operations at CAS



Alex Woo
CEO at W20 Food Innovation



Alpa Roman
Certified Senior Flavor Chemist at Lucta



Olivier Zimmer
Co-Founder & CEO at Spate



Jason McCaw
CEO at Intellex



Katie Crowley
Senior Flavorist at ADM Nutrition



John Bloch
R&D Director at Graeter's Ice Cream



Steve Leusner
Scientist, Inventor and Business Owner at Fields of Gold Consulting LLC



Richard Dandrea
Principal Flavorist at Robertet



Felicity J Woods
Lead R&D Technician at Catalyst Nutraceuticals



Jeroen van Dorp
Commercial Manager at ChainCraft



Liz Kreger, Ph.D.
Flavor Innovation and Analytical Manager at Sensient Flavors & Extracts



Natalie Taake
Senior Innovation Manager at Kroger



Sam Tharpe
Master Flavorist, Taste, Nutrition & Health at Symrise



Michael Colangelo
Director of Beverage Development at Surely Wines



Stephen Rich
Brewmaster, Certified Cicerone, Prud'homme Beer Sommelier



The State of Fragrance According to InterParfums

Jean Madar

The CEO discusses how the relationship between consumers and fragrance has evolved as well as current trends and demands.



InterParfums CEO and chairman Jean Madar has been with the company for 40 years and offers insight into how the fragrance industry—and the way consumers interact with it—has evolved.

According to Madar, a new generation of consumers have discovered body mists as an easy and affordable way to play, experiment, and create a customized fragrance experience.

Trends in the fragrance industry come in waves. Whether that be the introduction of gourmand, an obsession with vanilla, an experimenting mind discovering layered fragrances, or a taste for gender neutral scents, the industry is continuously evolving.

To gain an insider's perspective on the state of the fragrance, *Perfumer & Flavorist+* tapped Jean Madar, CEO and chairman of InterParfums. Madar is celebrating 40 years at the helm of InterParfums, boasting a brand portfolio including Ferragamo, Oscar de la Renta, MCM, GUESS, Donna Karan/DKNY and among notable others.

We asked Madar what current trends and demands driving innovation in fragrance, what makes for a winning juice and how the relationship between consumers and fragrance has evolved.

From your perspective, what are the current consumer demands/trends driving fragrance innovation?

Jean Madar [JM]: One key trend is the rise of new formats, some of which are not new at all! One example of this is body mist. Body mists were very popular in the 1990s and then fell out of favor. Body mists are diluted, so while they don't last as long as traditional fragrances, they are perfect for layering. This brings us to the second key trend, the demand for a customized fragrance experience. A new generation of consumers has discovered body mists, they are an easy and affordable way to play, experiment, and create a customized fragrance experience.

Are there any themes or common threads in today's leading fragrances?

JM: Yes, there has been a growing trend towards sustainability in the fragrance industry. This means that brands are increasingly looking for ways to reduce environmental impact and to use more sustainable materials in both the fragrance juice and packaging. Another theme is the movement towards gender-neutral fragrances that could be worn by anyone, regardless of their gender identity. This shift reflected changing attitudes toward how fragrances are marketed and perceived, with more emphasis on self-expression and less on attraction.

How has the relationship changed/evolved between consumers and their scents (whether wearing or purchasing)?

JM: Consumers fell in love with fragrance during the pandemic, and the love affair has continued. Consumers' mindset has shifted from purchasing fragrances to appeal to others to embracing wearing fragrance as something truly done for oneself and viewing fragrance as an integral part of their daily routine.

What does the future of fragrance look like?

JM: We can expect an increase in the popularity of fragrances that promote well-being and boost moods as more and more people aim to incorporate scent into their lives in a more holistic way. We spoke about the evolving perception of fragrance among consumers, who now view it as a means of self-care rather than merely a tool for social appeal. While pleasing others with a pleasant scent remains a significant factor in fragrance purchases, we anticipate consumers will prioritize their own preferences.



While pleasing others with a pleasant scent remains a significant factor in fragrance purchases, InterParfums anticipates consumers will prioritize their own preferences.



My thoughts are that when added at low levels to flavors bornyl acetate it lends authenticity to the profile. So next time you are working on earthy profiles consider using bornyl acetate.



BY CYNDIE LIPKA
Principal flavorist,
Bell Flavors and Fragrances

Flavor Materials Report

Flavorist panel evaluates bornyl acetate, Valerian root oil, magnolia flower oil and other materials.

Organoleptic Evaluation Panelists

- **Bill Aslanides**, Senior Flavorist, Synergy Flavors, Inc.
- **Deborah Barber**, Senior Flavorist, FONA
- **Nicole Hernandez**, R&D Manager and Senior Flavorist, FlavorChem
- **Christina Hook**, Flavorist, Bell Flavors and Fragrances
- **Judith Michalski**, Senior Flavorist, abelei flavors
- **Andrew Petrou**, Flavorist, Savory, Bell Flavors and Fragrances

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Eugenyl acetate, natural

Source: Vigon
FEMA# 3100, CAS# 8008-88-6
Odor: @ 0.1%. Brown, musty, earthy, sweaty, cedar, phenolic, smokey, animalic.
Taste: @ 0.*1 ppm*. Brown, earthy, slightly musty, woody, pencil shavings.
Taste: @ 0.5 ppm. Brown, earthy, woody, slight phenolic note, astringent, leathery.
*Possible application*s: Unlike Valerian root extract, there isn't much if any bitterness here. So that opens the possibilities to things that are not necessarily bitter. Initially, the panel leaned towards earthy brown profiles such as maple, mushroom, black walnut, Brazil nut and root veggies such as turnip. It could also play a role in smokey type flavors like Ancho and Chipotle peppers, smoked Gouda, bacon and ham. It's possible it could fit into campfire profiles such as marshmallow. Or in a vanilla or chocolate profile. And the last set of thoughts the panel had included aged barrel alcohol profiles: whiskey, rum, bourbon or wine.
➤**Vigon:** *https://www.vigon.com/*

2-Tridecenal (high *trans*)

Source: Bedoukian
FEMA# 3082, CAS# 7774-82-5
Natural occurrence: Apple, grape brandy, beef, cilantro, mutton, lamb.
Odor: @ 0.1%. Waxy, green, fatty, soapy, cilantro, sharp, pithy, peely.
Taste: @ 0.1 ppm. Waxy, green, fatty, soapy, cilantro, citrus peel, fresh.
Taste: @ 0.3 ppm. Waxy, clean, green, fatty, pithy, soapy, animal fat.
*Possible application*s: The panel was aligned with all the things where fatty, waxy, slightly soapy impact is needed such as cilantro, pineapple, cucumber, watermelon and perhaps avocado. This could contribute to waxy notes in apple, orange and grapefruit. Meat fat such as chicken, beef and lamb would benefit from the addition of this material. I believe that the clean character would be helpful in dairy flavors or mouthfeel enhancers.
➤**Bedoukian:** *https://bedoukian.com/*

Magnolia flower oil, P&N

Source: **Excellentia**
FEMA# 3950, CAS# 8006-76-6
Odor: @ 1%. Sweet, delicately floral, honey, pulpy, citrus (lemon), pineapple, minty, powdery, herbal and slightly musty and green at the end.



For me, magnolia flower oil is straight up love. I would use this in all the stone fruits, and in citrus such as orange, tangerine, clementine and mandarin.

Taste: @ 1 ppm. Sweet, pulpy, floral, fruity especially stone fruit, heavy, creamy, sweet, minty.
Taste: @ 3 ppm. Pulpy, waxy, floral and tea-like, strong, grassy, soapy, berry, citrus, sweet.
*Possible application*s: For me, this material is straight up love. I would use this in all the stone fruits, and in citrus such as orange, tangerine, clementine and mandarin. This would fit into berry profiles such as blueberry and blackberry, pineapple, honeydew. Several panelists felt that this would do well in tea profiles, taro, ube and sundried tomato.
➤**Excellentia:** *https://excellentiainternational.com/*

4-(4-Hydroxyphenyl)-2-butanone, natural

Source: MilliporeSigma
FEMA# 2588, CAS# 5471-51-2
Natural occurrence: Honey, loganberry juice, raspberry, blackberry, boysenberry, wine.
Odor: @ 1%. Sweet, berry, powdery, fruity, warm, floral, ripe, "red," acidic on the dryout.
Taste: @ 1 ppm. Low, sweet, berry, seedy, floral, fruity, powdery.
Taste: @ 3 ppm. Sweet, berry, floral, powdery, fully, fruity, ripe, candy-like.
*Possible application*s: This industry standard beauty packs a punch. While mostly referred to as raspberry ketone, this is not limited to raspberry profiles, but can be used in all berries including cranberry! It is often overused in blue raspberry. But this does have broader appeal in such things as grape, red apple, watermelon, peach, lychee,

pink lemonade, pink grapefruit, cherry, cotton candy, marshmallow fruit punches and a range of orange profiles to give sweetness and depth.
➤**MilliporeSigma:** *https://www.sigmaaldrich.com/*

Ethyl 3(2-furyl)propanoate

Source: Bedoukian
FEMA# 2435, CAS# 10031-90-0
Found in: Miso, rum.
Odor: @ 1%. Cinnamic, spicey, woody, slightly brown, barky, sweet, lifting, tropical, hot dog, slightly waxy, sweaky, balsamic, jammy, cooked, slightly floral on dry out.
Taste: @ 1 ppm. Cinnamic, spicey, slightly brown, woody, fruity, jammy, smokey, wine-like.
Taste: @ 2 ppm. Slightly waxy, powdery, berry, fruity, jammy, sweet, cinnamic, spicey, throat burn or tingle.
*Possible application*s: The panel thought that this material would be easily incorporated into cinnamon/cinnamic profiles. It could also be used for woody notes and would find a space in rum profiles. Or could be used in strawberry, raspberry, blackberry, grape, pineapple, cherry and flavors. We feel that material could be used for grilled and toasted fruit profiles. It could be used for an overripe note. I also thought this would work in mustard profiles.
➤**Bedoukian:** *https://bedoukian.com/*

Valerian root oil, natural

Source: Excellentia
FEMA# 3100, CAS# 8008-88-6
Odor: @ 0.1%. Brown, musty, earthy, sweaty, cedar, phenolic, smokey, animalic.
Taste: @ 0.1 ppm. Brown, earthy, slightly musty, woody, pencil shavings.
Taste: @ 0.5 ppm. Brown, earthy, woody, slight phenolic note, astringent, leathery.
*Possible application*s: Unlike Valerian root extract, there isn't much if any bitterness here. So that opens the possibilities to things that are not necessarily bitter. Initially, the panel leaned towards earthy brown profiles such as maple, mushroom, black walnut, Brazil nut and root veggies such as turnip. It could also play a role in smokey type flavors like Ancho and Chipotle peppers, smoked Gouda, bacon and ham. It's possible it could fit into campfire profiles such as marshmallow. Or in a vanilla or chocolate profile. And the last set of thoughts the panel had included aged barrel alcohol profiles: whiskey, rum, bourbon or wine.
➤**Excellentia:** *https://excellentiainternational.com/*



Citrus profiles dominated the suggestions for (e)-geranyl valerate with lemon, orange, grapefruit, mandarin, tangerine, lemon balm and Aperol as a few mentions.

(e)-Geranyl valerate

Source: MilliporeSigma
FEMA# 4123, CAS# 10402-47-8
Natural occurrence: Wormwood oil.
Odor: @ 100%. Stemmy, tomato, potato, herbal, harsh, fruity, lemon, floral vegetative, heavy, peppery, powdery.
Taste: @ 2 ppm. Mild, fatty, creamy mouthfeel, green, vegetative, fresh, herbal, lemon, waxy.
Taste: @ 5 ppm. Potato, stemmy, earthy, vegetative, green vegetable, floral, lemon, fruity, sweet, candied citrus, neroli, waxy finish.
*Possible application*s: Most of us had herbal and vegetative thoughts such as oregano, savory, sage, rosemary, thyme, green bell pepper, tomato, and raw potato. Citrus profiles dominated the suggestions with lemon, orange, grapefruit, mandarin, tangerine, lemon balm and Aperol as a few mentions. Also listed were fruit punch, peach, nectarine, blueberry, blackberry, raspberry, and mango. There were also some mentions of rose flavors.
➤ **MilliporeSigma:** *https://www.sigmaaldrich.com/*

trans-2-hexenyl isovalerate

Source: MilliporeSigma
FEMA# 3930, CAS# 68698-59-9
Natural occurrence: Lamb's lettuce.
Odor: @ 1%. Green, tropical, vegetative, fruity, juicy, sweet, pungent, waxy, lifting, herbal.

Taste: @ 1 ppm. Sweet, creamy, vanillin and vanilla.
Taste: @ 3 ppm. green, vegetative, pungent, sweaty finish, pear, waxy, slightly vegetative.
Possible applications: The panel was unified in thinking of mostly green flavors. On the sweet side, they thought of apple, pear, pineapple, mango, banana, peach, watermelon, guava, lychee, nectarine, blueberry, blackberry and mint (garden or spearmint). On the savory side, we thought of spinach, cilantro, tomato, lettuce, peas, green beans, and green peppers such as bell, shishito and cubanelle.
➤**MilliporeSigma:** *https://www.sigmaaldrich.com/*

Bornyl acetate, natural

Source: Treatt/Endeavour
FEMA# 2159, CAS# 76-49-3
Natural occurrence: Basil, bay laurel, bergamot, black currant, blood orange, buckwheat, cardamom, carrot, lemon, orange, coriander, cumin, curry, dill, galangal, gin, ginger, juniper, lavender, lime, mace, nutmeg, oregano, plum, rosemary, sage, savory, thyme.
Odor: @ 1%. Floral, perfumy, woody, earthy, strong, camphor, slightly minty, fatty, terpenic, piney, woody, herbal.
Taste: @ 0.5 ppm. Earthy, floral, mushroom, beet, sweet, medicinal, fresh, earthy, cedar wood, slightly herbal, spicey, musty, and irritating on the back end.
Taste: @ 1 ppm. Herbal, woody, musty, strong, camphoraceous, irritating, earthy, floral.
Possible applications: Bornyl acetate is found many places in our food and beverage options. My thoughts are that when added at low levels to flavors it lends authenticity to the profile. So next time you are working on earthy profiles such as carrot, beet, rosemary, cinnamon, clove, curry, ginger, sage, thyme, and gin, consider using bornyl acetate. This would also help boost pork and chicken broth profiles as well.
➤**Treatt/Endeavour:** *https://www.treatt.com/*

3-Mercapto-3-methyl-1-butanol

Source: Treatt/Endeavour
FEMA# 3854, CAS# 34300-94-2
Natural occurrence: Coffee, hops, wine.
Odor: @ 0.01%. Savory, beefy, chicken broth, strong, alliaceous, roasted, coffee, slightly eggy.
Taste: @ 0.01 ppm. Low, creamy mouthfeel, juicy meat, cooked, vegetative, weak, savory.
Taste: @ 0.02 ppm. Slightly fatty, savory, weak, beefy, lunch meat, savory, tropical, cooked, jammy.
Possible applications: The panel agreed that if umami had a smell, it would be this. The mouthfeel would promote unctuous beef, chicken, pork, taco, onion, teriyaki, mirepoix, au jus, cooked vegetable, broth and stew profiles. Also because of that mouthfeel we think that this could fit well in some dairy profiles such as browned butter, sour cream, cream cheese, casa fresca and other mild cheeses. There were a few mentions of cannabis and strawberry jam.
➤**Treatt/Endeavour:** *https://www.treatt.com/*



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