December 2023
www.PerfumerFlavorist.com

perfumer & flavorist®

The Resource for Sensory & Wellness Innovation



IFEAT Citrus Socio Economic Report Highlight

Industry Insights: Citrus Ingredients, Solutions, Blends & Enhancers

Sneak Peek at *World Perfumery Congress* 2024

Searching for Citrus Solutions

Discover key factors disrupting the categories across the citrus market.

WANT MORE?

Check out our digital magazine exclusives!

www.PerfumerFlavorist.com/DM

Allured business media

MilliporeSigma

essentially citrus

Our Flavors & Fragrance portfolio is stacked with ingredients for any citrus inspired formulation. In addition to our synthetic and natural aroma chemicals, we have essential oils straight from the groves.

Inspiration Central: SigmaAldrich.com/ff-citrus



MilliporeSigma is the U.S. and Canada Life Science business of Merck KGaA, Darmstadt, Germany.

© 2023 Merck KGaA, Darmstadt, Germany and/or its affiliates. All Rights Reserved. MilliporeSigma is trademark of Merck KGaA, Darmstadt, Germany and/or its affiliates. All other trademarks are the property of their respective owners. Detailed information on trademarks is available via publicly accessible resources.

47846 04/2023

always
inspiring more ...

symrise

Season's **Greetings**

The holiday season is just around the corner. We look forward to freshly baked cookies, the smell of pine trees and cinnamon in the room and spending time with the family. Our biodegradable, renewable and High Impact ingredients make the holiday season even more sensual. Contribute to make the world a better place, by using our sustainable ingredients. Follow the Symrise Aroma Molecules' matter of infinity and make an aromatic impact. Enjoy the holiday season!

Your Aroma Molecules Team · www.symrise.com



CONTENTS

VOL. 48 NO. 12 | DECEMBER 2023









6 **Editor's Note: Top 5 Headlines of 2023**

8 **Industry Insights: Citrus Ingredients, Solutions, Blends & Enhancers**
Discover the traceability, trends driving demand and the future of citrus.

10 **Product Roundup: Ingredients & Equipment**

DM1 **Industry News**

16 **Profiles: Huong Phan & Guy Vincent**

20 **Flavor Bites: Decanoic Acid**
By John Wright
Decanoic acid in dairy, savory, fermented, fruit and other flavors.

26 **Behind the Buzz of B Corporations in Flavor**
By Shane McDonald, Ph.D.
Outlining the finer points of B Corporations as it relates to the flavor industry.

32 **How A Flavorist Adjusts to Fluctuations in the Citrus Industry**
By Cyndie Lipka
A self-proclaimed citrus groupie shares workarounds for ingredient shortages as a flavorist.

33 **[Videocast] Go to the Core of Citrus with ADM**
The latest trends, challenges and solutions in citrus with chief citrus flavorist and global technical director of flavors, Zareena Valappil.

38 **Highlights of IFEAT's Socio-Economic Report on Orange**
By Peter Greenhalgh, Ph.D.
Outlining orange production characteristics, trends and challenges.

42 **Pura to Take *World Perfumery Congress* 2024 Stage**
Co-founder and CEO Bruno Lima joins chief fragrance experience officer Mara Dumski next summer in Geneva.

44 **Flavor Materials Report**
By Cyndie Lipka
Flavorist panel evaluates 9-decenal, davana oil, mate absolute and more materials.

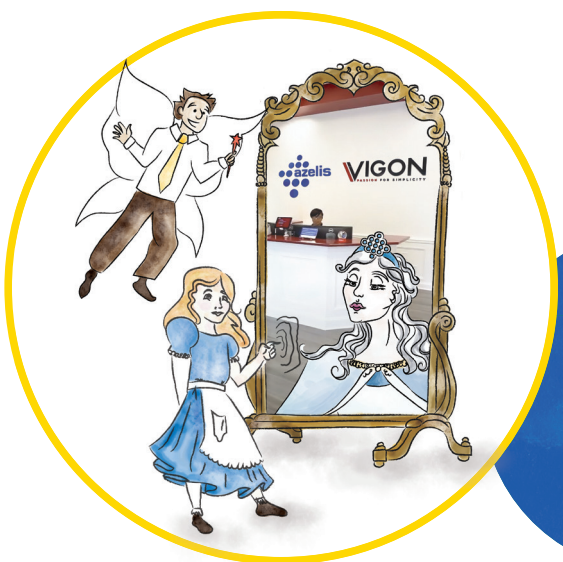
64 **Ad Index**

Visit ***perfumerflavorist.com/DM*** to view all digital magazine exclusives and expanded content.

MANY CHOICES
IN THE
Yipppeee!™ Wonderland!

The spread at our table offers a broad choice of ingredients for the most discriminating palates. Come through the looking glass for a wonderland of selection.





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

vigon.com

azelis

VIGON
PASSION FOR SIMPLICITY

CONTENTS







Want to report a new development at your company?

Send the details to:

Perfumer & Flavorist+ magazine

336 Gundersen Drive, Suite D

Carol Stream, IL 60188-2403 USA

fax: 1-630-653-2192 • e-mail: perfumer@allured.com

@perfumerflavorist | Perfumer & Flavorist | @perfumer_flavorist

perfumer & flavorist+

EDITORIAL

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

SOCIAL MEDIA

Social Media Specialist Crystal Dentis | 1-630-344-1821/cdentis@allured.com

ADVERTISING SALES

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

AUDIENCE DEVELOPMENT

Marketing Specialist Sam Attebery
Customer Service 1-847-559-7554/customerservice@perfumerflavorist.com

DESIGN

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

CORPORATE

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

Allured business media

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

OTHER ALLURED PRODUCTS

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

SUBSCRIPTIONS

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

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

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

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

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

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

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

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

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

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

INTERNATIONAL
FRAGRANCE
COMPANY
in alliance with dsm-firmenich

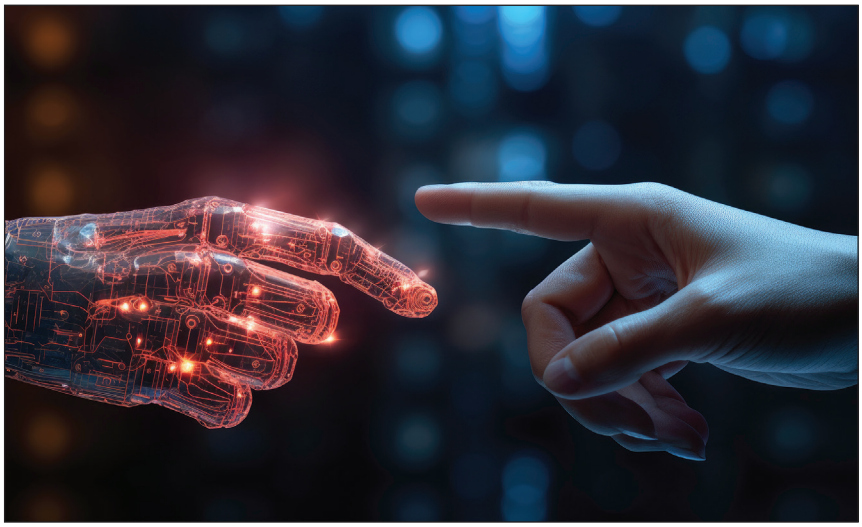
Established in 1961

“for the love of fragrance”



mgfragrances.com

Top 5 Headlines of 2023



Throughout 2023, readers have been the hungriest to intake headlines covering artificial intelligence in F&F as well as emerging ingredient launches.

As we close the chapter on 2023, *Perfumer & Flavorist+* (*P&F+*) wanted to take a look at the trending headlines of the year[a]. Other than the latest appointments, we've combed our analytics to pinpoint the top five most read stories:

1. "Google Spin-Off Osmo Develops AI to Create Aroma Molecules for Fragrances"
2. "Givaudan and IFF Launch Citrus Ingredient Alternatives"
3. "Top F&F Companies Under European Commission Investigation"
4. "dsm-firmenich Confirms Successful Merger and Shares Company Details"
5. "How to Apply Taste and Smell Neuroscience to Create Taste Modulators," an article teasing founder and CEO of W2O, Alex Woo's *Flavorcon* 2023 session discussing NeuroFoodScience, the application of neuroscience in food science as an approach to creating natural taste modulators.

The honorable mention goes to Procter & Gamble research fellow Phil Porter's article, "3 Change Agents Shaping Fragrance Formulation," in the March 2023 issue. Porter digs into three areas, in particular, having the biggest impact on the fragrance industry—regulation, sustainability and machine learning. With these six headlines in mind, we are tracking a real hunger from readers for insight into evolving technologies (with an emphasis on artificial intelligence), ingredient portfolio launches to combat material shortages as well as major shifts in the industry. *P&F+* plans to dig further into these topics throughout 2024. If you have a topic you'd like to explore, send me an email jtroyli@allured.com.

[a]Due to deadline restrictions for print, these Google Analytics numbers were pulled from headlines posted January 1, 2023 through October 22, 2023. This list has been updated on *www.perfumerflavorist.com*.



JENNA TROYLI
Managing Editor
jrtroyli@allured.com

Editorial Advisory Board

SCOTT CHAPLAN
SCMC Consulting

DARRYL DO
Perfumer, Delbia Do Fragrances

ALISON FREEDMAN
Senior Flavorist
dsm-firmenich

CYNDIE LIPKA
Principal Flavorist
Bell Flavors & Fragrances

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

NEHA OKHADE
Perfumer
Agilex

JOHN WRIGHT
Independent Flavorist and Author



BE *Innovative*

An artisan approach to sensory solutions.

Since our initial inception, Berjé has consistently strived towards laying a better foundation for the next generation of perfumers, flavorists, and industry innovators. Our own in-house team of chemists and evaluators are making constant advancements in sourcing and sustainability every year: new extraction techniques, formulations, sustainable harvesting methods, and upcycling initiatives are just a few of the steps we've made on the road towards evolving our industry.

THE BERJÉ GROUP

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

INDUSTRY INSIGHTS:
CITRUS INGREDIENTS, SOLUTIONS, BLENDS & ENHANCERS

Discover the traceability, trends driving demand and the future of citrus.



Featured Insiders:

- Evolva

Evolva's Gaël Boyenval shares one challenge product developers face when working with alternative citrus solutions could be that biotech ingredients can have a different olfactive profile than citrus derived ingredients.

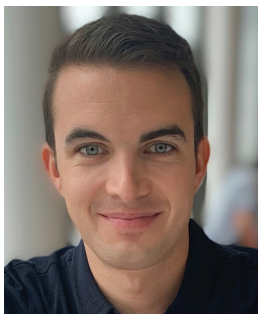
Reproduction in English or any other language of all or part of this article is strictly prohibited. © 2023 Allured Business Media.

The global citrus flavors market[a] is valued at $11.64 billion and is projected to expand at a CAGR of 4.9% until 2033 where it is anticipated to reach $18.79 billion. *Perfumer & Flavorist+* (*P&F+*) connects with Evolva's Gaël Boyenval to discuss citrus replacers, technology advances in citrus solutions and challenges formulators face when working with alternative citrus solutions.

You can discover more about the citrus market on **page 38** in the IFEAT Socio Economic report.

GAËL BOYENVAL, director of Business Development, Evolva

***P&F+*: The industry is seeing many launches in citrus replacers, what does the future look like for these launches in the market?**



Gaël Boyenval

Gaël Boyenval [GB]: "Citrus" is one of the leading flavor categories, specifically for beverages and confections. Manufacturing beverages at large scale requires lots of flavor which eventually drives demand up for fresh citruses from which fractions and isolates are extracted.

Unfortunately, citrus crops have suffered a lot over the past decades because of climate-related events such as hurricanes and the greening disease—today grapefruit production in the United States is four times lower than it was 20 years ago.

The "citrus replacers" are therefore a great alternative to citrus derived ingredients in order to maintain the large-scale production of beverages and other citrus flavored goods.

***P&F+*: What are some of the latest technology advancements in citrus solutions?**

GB: Biotechnology is one of the latest technological advancements that makes large scale citrus ingredients manufacturing possible.

Nootkatone, the "signature molecule" of grapefruit would be a great example. With the significant reduction in grapefruit crop and the fact that the nootkatone concentration in the fruits has also been decreasing, there would simply not be enough fresh grapefruits to make as much nootkatone as needed by the F&F industry.

Thanks to biotech, Nootkatone can be manufactured at large scale, economically and while preserving natural resources.

New advancements in biotechnology also make possible the production of EU natural Nootkatone, which was a big demand from the EU market and from global company managing international launches.

***P&F+*: What can be some of the challenges product developers face when working with alternative citrus solutions?**

GB: To elaborate further on biotechnology, one challenge could be that biotech ingredients can have a different olfactive profile than citrus derived ingredients.

Valencene (one of the key molecules of sweet, juicy and fresh oranges) would be a good example. Indeed, orange-derived valencene has a typical sweet, fresh, juicy orange profile–simply because an orange derived valencene fraction will contain 70% Valencene and 30% "other molecules" from orange (all the orange spectrum will be represented).

A typical biotech-derived Valencene fraction will typically contain 70% valencene but 30% "other compounds" that will be valencene isomers (very different from the "other molecules" found in orange), impacting the overall olfactive profile.

So, at first sight, when comparing an orange derived valencene fraction with a biotech derived fraction, one could think that the biotech source might not be a good alternative to the citrus source.

However, the importance is not to stop at the 1:1 comparison but to try the biotech ingredient in application … only to discover that it will work as well as the citrus derived ingredient and provide the sweet, fresh and juicy profile that was wanted.

p&f+

[a] *https://www.futuremarketinsights.com/reports/citrus-flavours-market*

Ingredients and Equipment



Sweet Blonde Orange Oil, Natural

MilliporeSigma, product of Simone Gatto

www.SigmaAldrich.com/W282111

Brighten your next formulation with the fresh, sweet citrus notes of Simone Gatto's sweet blonde orange oil (FEMA# 2821, CAS# 8008-57-9). This oil is Kosher, natural, from renewable feedstock and distributed by us in North America. Contact us at ff@milliporesigma.com for a free sample.



Sulfurol, Natural, Neat

Penta International Corp.

www.pentamfg.com

Now offering Sulfurol, Natural, Neat (FEMA# 3204, CAS# 137-00-8, JECFA# 1031). It contains a flavor base as meaty, brothy, roasted and nutty. Odor notes as meaty, brothy, nutty and sulfureous. Our material is Food Grade, Kosher and Halal.



Ozonil

Symrise AG

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

Ozonil (CAS# 22629-49-8) comes with mandarin peel, waxy, coriander and ozony characteristics. The readily biodegradable and high impact specialty creates marvelous effects with tiny amounts. It boosts top notes in citrus and fruity compositions and enhances fresh spring flower accords. Ozonil is clean and cool.



V-Hot NAT

Ernesto Ventós

www.ventos.com/index.php/en/producto/16585/V-HOT+NAT./223

Do you want to give a strong hot and pungent character to your savory and sweet flavoring compositions? V-Hot US NAT is a special ingredient that imparts a pure and clean hot taste without any additional odor or color. It can be used in a wide range of solubilities.

Elevate your senses –

Discover Isobionics® new products

Get a free sample:

- Isobionics® Natural *alpha*-Bisabolene 98
- Isobionics® Natural (-)-*alpha*-Bisabolol 99

Crafted with our cutting-edge fermentation technology and inspired by nature's harmony.

Our high purity and high quality natural flavor ingredients help you create a symphony of delightful tastes – from soothing to refreshing to bold.



Isobionics®

A brand of BASF

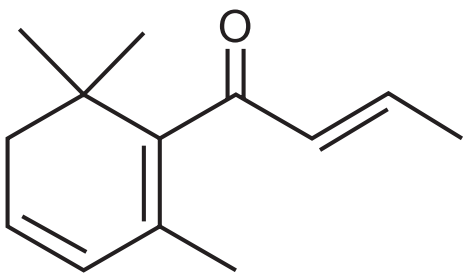


Maxitrus

Mane

www.mane.com/media/mane-at-flavourtalk

Mane Maxitrus (CAS# 30689-75-9) is a green chemistry molecule with radiant and aldehydic properties. Its sweet, green, and orange-like profile makes it suitable for sweet categories, and ideal for boosting the naturalness and juiciness of orange beverages.



Damascenone Total

Hangzhou Grascent Co., Ltd

www.hangzhougrascent.com

Damascenone total (FEMA# 3420, CAS# 23696-85-7/23726-93-4) features an intensely natural floral fruity note with rose, plum, berry and tobacco odor. Suggested applications includes, fine fragrance, personal care, fabric care, home care. Recommended use level is traces to 0.2%



Isobionics® Natural α-Bisabolene 98

Isobionics

www.isobionics.com/global/en/product-finder/natural-alpha-bisabolene-98.html

Isobionics® natural α-bisabolene 98 (CAS# 17627-44-0, Flavis# 01.027) features an odor profile consisting of oily, coconut/Brazil nut, slightly mushroom, milky lactone note, parsnip, costus oil and a warm vanilla like note. Its taste profile features white flowery with a creamy lactone note, coconut milk.



p-Menthen-8-thiol

Natural Advantage, LLC

www.natadv.com

Natural Advantage introduces natural p-menthen-8-thiol (FEMA# 3700, CAS# 71159-90-5). Occurring naturally in grapefruit, this material can be described as powerful, citrus, grapefruit, sulfurous, tropical, herbal and juicy. p-Menthen-8-thiol lends maximum character at sub-ppb levels to mango, peach, blackcurrant, grapefruit and white wines. Possible applications include grapefruit juice, orange juice, passion fruit, mango, peach, and other sulfurous top-noted tropical fruits. Recommended use level is 0.001-0.01ppb as consumed. It is EU and U.S. Natural, Kosher, vegetarian and non-GMO.



indesso

55 Years

GINGER UP

with Indesso's Rhizome Extracts

Ginger | Red Ginger* | Turmeric | Galanga

**Including high gingerol and shogaol*

With our advanced processing and delivery system technology, **we deliver both the benefits and freshness just like from nature itself.**









PT Indesso Aroma
Jalan Tanah Abang 2 No. 78
Jakarta 10150, Indonesia
T: +62 21 386 3974
www.indesso.com

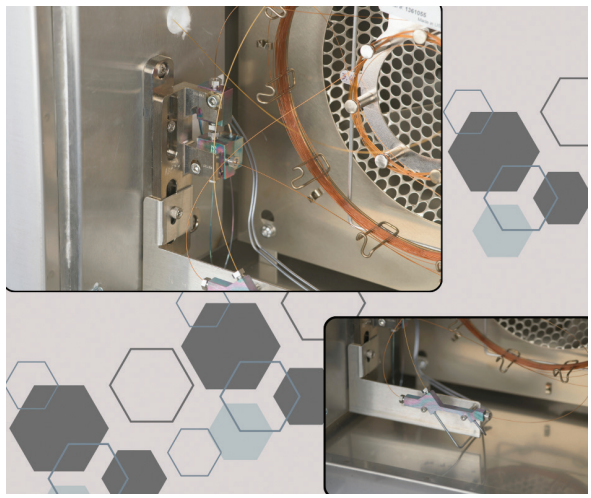


Blood Orange Oil

Berje Inc.

www.berjeinc.com/products/essential-oils/blood-orange-oil/

Blood orange oil (FEMA# 2825, CAS# 8008-57-9) is produced using the Citrus x sinensis 'Blood Orange' fruit, which is endemic to southern Italy. The oil is bursting with vibrant sweetness, possessing an intensely fruity and "pulpy" aroma that is exceptionally appealing. Its drydown is light and refreshing, with a slight tart and aldehydic tinge.



Paradigm Flow Modulator and Shift Flow Splitter

LECO Corp.

https://go.leco.com/paradigm-shift

Paradigm Shift in GCxGC Workflows: Unlocking the Potential Complex Sample Characterization.



Elemental Container Inc.

2.5 to 30L wide opening aluminum drum

www.aluminumbottles.com/essential-oils-flavors/

The Tournaire monobloc O220™ range offers an extra-large opening while guaranteeing optimal tightness. With controlled chemical, microbiological and particle cleanliness it is used to store and ship sensitive products such as jasmine, rose concrete, iris butter.

Feel free to contact us at pf.inquiry@elementalcontainer.com for a free sample.



Agrumaria Reggina



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

Discover our citrus world at
agrumariareggina.it/ourcitrus

Symrise Debuts Dry Pet Food Pilot Production Line at Regional Headquarters in France



It is said that with this development, Symrise experts can study how the kibble production process and the matrix itself impact pet food palatability, pet nutrition and the efficiency of pet food protection solutions.

On September 13, 2023, Symrise debuted its dry pet food pilot production facility in Elven, France. The facility is designed to bolster the global leadership of Symrise in pet food by producing high-value solutions that enhance the well-being of pets and the satisfaction of pet owners. The pilot production line is said to be equipped to meet internal research and development requirements while also assisting customers with their own processes.

The company shared that their experts can study how the kibble production process and the matrix itself impact pet food palatability, pet nutrition and the efficiency of pet food protection solutions. The pilot plant is said to integrate the entire dry pet food production chain–from raw material preparation to coating, extrusion and kibble drying.

Alexis Peuto, Innovative Technology R&D Manager Symrise Pet Food, shared, "From an R&D perspective, this new facility brings additional possibilities for our teams. They can directly study the kibble matrix and its production process. This way, they get a full understanding of how our palatability, pet nutrition and pet food solutions interact with kibbles of standard to premium to super premium positionings".

Bertrand de Launay, president at Symrise Pet Food added, "We now offer the greatest flexibility and instrumentation we know of. Our dry pet food pilot production line forms the final addition to the set of capabilities we offer pet food manufacturers. We are helping them to design future foods for pets that meet the challenges of today and tomorrow."

p&f+

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

Newform Foods Partners with Mane for Cost-Effective Protein Production



The partnership is said to focus on the taste of cultivated meat and the development of premium and cost-effective products.

Newform Foods, previously Mzansi Meat Co., is a food technology company leveraging a continent-spanning research and development network to help food producers develop and scale cultivated animal products.

The company announced recently that it has entered into an agreement with Mane. The partnership is said to focus on the taste of cultivated meat and the development of premium and cost-effective products, leveraging Mane's experience in food and flavor to enhance the cultivated muscle and fat across species and products.

Mane vice president Savory Category EMEA, Eric Davodeau and Mane's vice president Strategy Development, Luis Fernandez stated, "Newform Foods team will work alongside Mane's Cape Town and Mane Corporate teams to advance this project, with access to applicative, analytic, regulatory and sensory flavour sciences to new product development from Newform. As leaders in flavor, functional blends and seasonings, we're excited to expand our offering and give consumers a taste of what's possible when innovation and food expertise come together. Newform Foods has proven to be a thought leader in food technology and together with our experience, we're excited to shape the future of food!"

Tasneem Karodia, Newform Foods co-founder and COO, recently said, "We aim to create hybrid cultivated meat products that will blend with plant-based protein to elevate the taste, texture, color and flavor of what's currently on the market. While Newform Foods is working to reach scale and price parity with conventional meat, hybrid products will be the first to hit the market."

[Review Article] Industrial Fragrance Chemistry: A Brief Historical Perspective



Researchers chronicled the history of key discoveries and technological advancements at the intersection of fragrance chemistry and fast-moving consumer goods.

In September 2023, the European Journal of Organic Chemistry published a comprehensive review article titled "Industrial Fragrance Chemistry: A Brief Historical Perspective," by Olivier David (University of Versailles and Osmotechque) and Franco Doro (FD-Innov).

The duo partnered to chronicle the history of key discoveries and technological advancements at the intersection of fragrance chemistry and fast-moving consumer goods (FMCG), with a particular focus on beauty and cleaning products.

The authors shared, "We have a deep passion for perfumery, scientific communication, consumer products and history and we wanted to bring it all together in this review article. We shed light on the remarkable scientific breakthroughs of the past, illuminate how fragrance has influenced the evolution of consumer products, and unveil some lesser-known dialogues among pioneers in the field."

Abstract

Perfumery has evolved from a handcraft activity, marking supreme aristocratic luxury in the Renaissance, to a global industry powering scent experiences for present-day consumers through the use of a myriad of consumer packaged goods. This contribution reviews major breakthroughs in the field, including landmark fragrance ingredients, technological advances in scent delivery, and key innovations in consumer products which created the demand for scientific and technological advancements in the scent domain. These innovations are presented chronologically, relying solely on information drawn from public written sources, spanning a time period of 150 years (1870-2020). We hope with this contribution to generate interest in the readership for this fascinating field, while celebrating 150 years of innovation for scented mass-market products.

To discover the entire article, visit *chemistry-europe.onlinelibrary.wiley.com*.

Food Flavoring Manufacturer Senovia Launches in the UAE



Senovia specializes in creating liquid flavor solutions for beverages, dairy, confectionery and bakery goods.

International food flavoring manufacturer, Senovia, has launched in the UAE with a dedicated product research and development satellite facility. Senovia is part of the Arethia Group. With its headquarters in Switzerland and production facilities in Germany, Senovia's UAE presence will pioneer the group's entry into the international food flavoring industry and serve the Asia, Middle East and Africa (AMEA) regions at the product development level.

Senovia specializes in creating liquid flavor solutions for beverages, dairy, confectionery and bakery goods.

Emilie Nault, managing director of Senovia stated, "Our modern approach towards flavor development and manufacturing has been meticulously crafted with the intention of revolutionizing the global F&B industry's taste requirements. As we kickstart our UAE operations, we aim to work alongside the AMEA's F&B industry to provide sustainable, accessible and top-notch alternatives in the realm of food flavorings. Simultaneously, encouraging industry innovation by embracing the latest technologies that are capable of enhancing flavors and infusing memories is also a core mission."



One-on-One with RIFM President Anne Marie Api

In September 2023, *Perfumer & Flavorist+* attended the Research Institute for Fragrance Materials (RIFM) 57th Annual Meeting in New Jersey. President Anne Marie Api shares current projects, upcoming studies and more in this one-on-one interview.



RIFM president Anne Marie Api shares current projects, upcoming studies and more in this one-on-one interview.

Can you share a few words about the recent RIFM 57th Annual Meeting?

Anne Marie Api [AMA]: The Research Institute for Fragrance Materials' (RIFM) strategy guides and informs everything we do, from the ongoing research that refines our safety assessment process to the communications through which we educate and engage with fragrance safety stakeholders worldwide.

At this year's Annual Meeting, we highlighted our New Approach Methodology (NAM) Strategy, which guides and prioritizes our research projects. NAMs refer to non-animal-based approaches to provide information for the hazard and risk assessment of fragrance ingredients.

We also highlighted some of RIFM's ongoing collaborations—through our featured speaker, the International Collaboration on Cosmetics Safety's Erin Hill, formerly of the Institute for In Vitro Institute Scientists, and this year's RIFM Board of Directors Excellence in Science Award winner, Dr. Daniel C. Liebler, a former member of the Expert Panel for Fragrance Safety. RIFM strategically collaborates across academia, industry, and governmental agencies to facilitate the free exchange of critical science and information and eliminate duplicative effort.

Additionally, the Annual Meeting is a place to reflect on the highlights from the previous year. Dr. Robert Weinstein, Chair of the RIFM Board of Directors, and Dr. Anne Marie Api, RIFM President, reported on the milestone of having a safety assessment on more than 1800 fragrance ingredients, with almost 1600 published in the peer-reviewed literature. RIFM's maintenance program has been in place since 2020 with every fragrance material reviewed every 5 years.

The Annual Meeting is also a forum for fragrance safety stakeholders worldwide to engage and form collaborations with and learn from their peers.

How has RIFM adapted over the years with engagement with the industry and members?

AMA: RIFM does what it does to ensure everyone can safely enjoy their favorite fragranced products. We have always relied on collaboration and strategy to ensure this. But, most recently, we've begun to communicate our ongoing progress in a much broader way. RIFM's peer-reviewed and published science, including dozens of recent research papers and safety assessments covering some 1,600 fragrance ingredients, is free to anyone who wants or needs it via the Fragrance Ingredient Safety Assessment Center.

Can you touch on current projects/studies RIFM is working on?

AMA: Currently, RIFM's priorities include a series of published and in-progress papers on RIFM's clustering process, a low-exposure paper, and an update to our environmental framework.

RIFM's Computational Chemistry team recently created a video introducing the process and several short Q&A introductions to clustering, the read-across process, and endpoint-specific read-across. Read-across is an internationally recognized alternative to animal testing. Scientists use an ingredient for which there is a lot of data to help predict the toxicological profile of a structurally similar ingredient for which little to no data exists. Before identifying a scientifically sound read-across ingredient, the first big step is to cluster all ingredients in current use so that scientists can easily isolate those with similar safety profiles.

The low-exposure paper makes abundantly clear what RIFM scientists have known for a long time: Even those consumers in the top 5% of product usage are exposed to very little fragrance, even when considering all products used. The exposure to the vast majority of fragrances falls below the Threshold of Toxicological Concern, or TTC, a level beneath which science tells us there is no real risk for harm.

Finally, it has been two decades since the first landmark publication of the RIFM Environmental Framework, and we are updating it to make it more comprehensive. The refined version includes new developments in computational modeling and updates in study guidelines and methodologies that became available after the 2002 Framework was published.

From your perspective, what are the current focuses for RIFM?

AMA: While science constantly evolves, RIFM's primary focus hasn't changed since we were incorporated as a non-profit science institute in 1966: Ensuring consumers can safely enjoy their favorite fragranced products. What has changed are some of how we accomplish that goal.

For more than a decade, our entire Research Program, in addition to helping refine our Safety Assessment process, has been focused on specifically developing and refining animal-alternative methodologies to broaden the toolbox available to all those performing safety evaluations.

Finally, as we near the completion of evaluating and publishing safety assessments for all fragrance-producing ingredients in current use, we have made enormous headway into the simultaneous task of reevaluating every assessment five years after its first publication.

p&f+

Lanxess President and CEO Antonis Papadourakis Retires

Lanxess Corporation announced the retirement of president and chief executive officer (CEO), Antonis Papadourakis. Frederique van Baarle, a member of the Board of Management and Labor director of Lanxess AG, assumed the role of president and CEO for the company's Americas region on October 1, 2023.

Papadourakis, who joined the company as CEO in 2015, retires after a 35+ year career in the chemical industry.

"It has been an honor to have been a part of the world-class team at Lanxess, and having the opportunity to work alongside so many amazing colleagues," said Papadourakis, who officially retired on September 30, 2023 after more than eight years as President and CEO of Lanxess Corporation.

"I'm eternally grateful for the wonderful experiences and the professional and personal relationships developed during my tenure here. The team, and future operations within the region, have a bright future with Frederique van Baarle at the helm."

van Baarle has held various management and leadership roles with the company since joining in 2011, and brings more than 20 years of global chemical industry experience to her new role. She previously led the company's High-Performance Materials business unit, which spun off in a joint venture in April 2023, after heading a regional Engineering Plastics business line and serving in various management positions at at Royal DSM before joining Lanxess.



Lanxess Corporation announced the retirement of president and chief executive officer (CEO), Antonis Papadourakis (L) and Frederique van Baarle (R), a member of the Board of Management and Labor director of Lanxess AG, assumed the role of president and CEO.

"I am very excited for the opportunity to lead the team here in the Americas, which is becoming an increasingly important region for our industry and for Lanxess," said van Baarle.

"I'm incredibly appreciative for the leadership Antonis has shown over the past few months during this transition, and I look forward to meeting so many colleagues and building upon the well-established safety and sustainability programs already in place."

p&f+

PROFILES:
HUONG PHAN and GUY VINCENT

Two F&F creators share their journey to the industry, project wins and more.

Huong Phan, R&D Director, Mosaic Flavors

***Perfumer & Flavorist+* [*P&F*+]: What led you to the flavor industry?**

Huong Phan [HP]: I started my career as a chemist before entering the flavor industry over 40 years ago. My entire life, I was interested in using chemicals to create a variety of flower scents and develop/collect perfumes. This made it very easy to segue into the food and fragrance industry, which I have enjoyed so very much. I really believe that I was born to do this work and can't imagine doing anything else.

***P&F*+: What applications do you primarily formulate for? Do you have a favorite?**

HP: Our team works on formulas across all food and beverage applications. It is energizing to receive a new request from a customer that expands your thinking and pushes your scientific mind to the limit.

I personally focus most of my efforts on product formulations within the beverage and dairy categories. I'm not sure exactly why, but these are two categories that I enjoy putting my mind to work on creating new flavors with a variety of functionality requirements.

Over the entirety of my career, I have developed thousands of different flavors that have gone into a countless number of products. But personally, I don't think anything can be better than the taste of a classic vanilla.

***P&F*+: Advice for people coming into the flavor field.**

HP: I have had the pleasure of working with many new and young scientists eager to get into the flavor industry. I always work with them to understand that this industry requires a lot of creativity, and it is best suited to those who enjoy a unique mix of science and art. While a significant amount of science is involved, creating a flavor is an art!

As cliché as it may sound, a flavor chemist must be able to innovate and think "outside of the box." There are hundreds of different formulations for a strawberry flavor that can be easily replicated. However, our profession requires us to make something that is instantly recognizable, such as strawberry, yet still gives our customers' products a distinct flavor profile and at a price point that they, and the consumer, will find acceptable. At its core, that is what a flavor chemist is all about.



Name: Huong Phan

Title: R&D Director, Mosaic Flavors

Location: Chino, California, USA

***P&F*+: How has the job of a flavorist changed during your career?**

HP: I have been in the industry for over 40 years and while the core skills needed to create flavors are still the same, the ways in which we work have changed dramatically. Technology in the laboratory is definitely one of the biggest changes. I laugh sometimes as I think about hand-written formulas stored in filing cabinets on note cards. The speed with which we are able to move from concept to formula is truly remarkable.

Consumer savvy is probably one of the other big changes that I have seen. As consumers look for more natural and organic items or review labels for certain ingredients (or lack thereof), we've had to refine our skills to match the marketplace's direction. I'm glad that our company focuses on the natural and organic flavors market. It gives me a purpose each day to enter our flavor laboratory and develop flavors that will be effective for our customers' products and accepted by the consumer.

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

Feeling

Life can take turns,
but the essence remains
intact.



PARTNERING FOR LIFE

MORE INFO ON WWW.VIDARA.COM

Vidara

***P&F+*: What is the best part of your job?**

HP: I believe that it all starts with the fact that I am a person who enjoys creating. I like to cook and create new food combinations. I like to garden and grow my own vegetables and create new sprouts. I have been extremely fortunate to have found a profession that allows me to create something new every day.

I am thankful to be part of a team that works diligently to develop new flavors that millions of people around the world will be consuming. It is so very rewarding to walk down many grocery store aisles and see the results of our collective work on the shelves.

Guy Vincent, CEO & Perfumer, Dutjahn Sandalwood Oils

***P&F+*: What led you to the fragrance industry?**

Guy Vincent [GV]: I started off working as a brewer way back before craft brewing really took off. I studied malting and brewing science and really loved the sensory testing of the job but was frightened that I would turn into a sick old dude if I drank a ton of beer every day, so I started studying herbal medicine. One of the classes was aromatherapy, which opened my world to all these amazing and beautiful essential oils. I was a perfume lover too so I was immediately drawn to blending, creating, and experimenting with every fragrant material I could get my hands on. This passion combined with my keen olfactory capability and all the technical, quality and manufacturing skills from the beverage industry led me into technical roles in cosmetics and aromatherapy companies and then finally a perfumer. I'm in a managerial role now but still perfume for the company in applications work and select external creative projects.

***P&F+*: What is your first scent memory?**

GV: Indelible very early scent memories of summer family camping trips beside the Murray River in Australia with searing sunshine heating tent canvas, digging in fishy-amine tainted sand, surrounded by enormous river red eucalypt trees breathing deep their distinct aromatic majesty and their dry cracking leaves and bark puffing a differentiated odor patina breaking under bare knees as I chase what crawls nearby.

***P&F+*: What applications do you primarily formulate for? Do you have a favorite?**

GV: Everything where Australian sandalwood has an application, primarily hair, body and skin care as well as fine fragrance and air care too.

As a perfumer, you rarely can deep dive into a single ingredient. Working here, I'm able to explore Australian sandalwood oils by fractions and provenance to create bespoke blends, then test their application in formula. You have a lot more freedom and time, so you learn the subtleties of the material and you can explore unexpected things like how even small amounts of Australian sandalwood can amplify fragrance strength, presence, and a variety of olfactive territories.



Name: Guy Vincent

Title: CEO & Perfumer, Dutjahn Sandalwood Oils

Location: Perth, Western Australia, Australia

I also oversee R&D, so when we create products, we start from the position of "as a perfumer, what do I need?" It's a very perfumer-centric approach. This is what we did to create the Desert Dry collection. I was working on body and air care formulations and wanted something with more lift, power, that presented olfactively earlier in formula, and gave formulations the woody mystique of a material that's been used culturally by first nations people for tens of thousands of years, so that's how we came to create the Desert Dry Complete and Desert Dry Super.

***P&F+*: Advice for people coming into the perfume field.**

GV: Understand your materials deeply, what you're using, and where it came from. Is it ethical? Is it sustainable? Is it the material that YOU want, morally and technically? Be selective while always learning. Push every boundary you can to select what is right for you, because your creation is a reflection of you, your values and your art.

***P&F+*: How has the job of perfumer changed during your career?**

GV: The consumer's position. The industry has evolved from offering consumers products manufactured by companies to giving consumers what they want. Consumers are demonstrating more than ever that they want, and rightly so, products that do not contain ingredients that are harmful to them, the environment, or society. Companies must have integrity, fragrances must be ethical, and past wrongs must not be repeated.

Meet Lemon Myrtle. It's citrus maximized.

Anything else is a lemon

Lemon Myrtle sets the gold standard as an unparalleled natural source of citral, the key compound behind its captivating aroma, sophisticated flavor profile, and multitude of functional benefits. With over 90% citral in its essential oil, it surpasses lemongrass (65 to 85%) and lemon (a mere 4%). Rich in antioxidants, Lemon Myrtle is not only the favored citrus note in luxury teas but also a rising star in high-end perfumery, as well as a signature ingredient in premium spirits like the award winning Four Pillars gin.

A botanical powerhouse

Beyond its acclaimed role in fragrances and personal care formulations, where its natural preservative, antimicrobial, antifungal, antiseptic, and antibacterial properties are highly valued, Lemon Myrtle is making strides in innovative health and wellness applications. It's gaining traction as a key ingredient in cognitive-enhancing nootropics, stress-reducing adaptogenic solutions, wellness-boosting products like Swisse Earth's Collagen Boost powder, and luxury eco-friendly laundry detergents.

From Australia to the world

Native to Australia's lush subtropical rainforests, Lemon Myrtle is fast becoming a global sensation. The plant's multiple applications range from teas, candles, beverages, personal care and cleaning products, to a plethora of beauty and wellness products. Australian Native Products, with 25 years of groundbreaking cultivation, stands as the world's largest grower and supplier of Lemon Myrtle. Formats, include dried leaf, powder, essential oil, hydrosol, and specialized extracts, all meticulously designed to meet the international demand and emerging market needs for this extraordinary botanical.





Discover more

Visit australiannativeproducts.com.au

Australian Native Products



Decanoic acid is used at varying levels in butter flavors, ranging from 500 ppm up to as high as 5,000 ppm.



BY JOHN WRIGHT
johnwrightflavorist@gmail.com

Flavor Bites: Decanoic Acid

Decanoic acid in dairy, savory, fermented, fruit and other flavors.

Decanoic acid (FEMA# 2364, CAS# 334-48-5) sits very comfortably between the category of ingredients used primarily for their aroma and the category used primarily for taste effects.

The aroma of this chemical is quite complex. It is distinctly cheesy, with some aspect of the goaty character of octanoic acid. It also has a modest connection to the rather soapy profile of dodecanoic acid. It is pretty much an essential component of dairy flavors, but it can also enhance many other categories.

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.

Dairy Flavors

Butter: Decanoic acid, sometimes called capric acid (rather confusingly, given caproic and caprylic acids), is used at varying levels in butter flavors, ranging from 500 ppm up to as high as 5,000 ppm.

Cheese, Blue: Levels in blue cheese flavors also vary, but generally tend to be on the high side, typically around 4,000 ppm.

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

Cheese, Cheddar: A high level of addition is also very effective in all cheddar cheese flavors, ranging from 5,000 ppm to 6,000 ppm. Similar levels are also used in toasted cheese flavors.

Cream: Fresh cream flavors are a different story. Moderate levels of decanoic acid work best, starting at 500 ppm.

Milk: Five hundred ppm is, unsurprisingly, also a good level in fresh milk flavors.

Milk, Condensed: The choice of level in condensed milk flavors is a little more complicated. Decanoic acid can be used in conjunction with a high level of dodecanoic acid, in which case 1,000 ppm works well. If decanoic acid is used alone, which is quite feasible, then levels can range up to 6,000 ppm.

Yogurt: Two thousand ppm can often be a good level for decanoic acid in yogurt flavors. This can be lower if a more delicate profile is required.



In beer flavors, the ideal levels of decanoic acid are a little surprising. Light, lager-style, beers can benefit from around 300 ppm, but dark beers work best with lower levels, around 100 ppm.

Fermented Flavors

Beer: Decanoic acid is an important part of all fermented flavors, second perhaps to octanoic acid. In beer flavors, the ideal levels are a little surprising. Light, lager-style, beers can benefit from around 300 ppm, but dark beers work best with lower levels, around 100 ppm.

Brandy: Unsurprisingly, given the aroma contribution from yeast by-products, the ideal level in brandy flavors is much higher, around 1,500 ppm.

Bread: The ideal addition of decanoic acid to bread flavors depends on the type of bread. Low levels work well for some types, but more robust profiles, such as pizza, need around 500 ppm.

Dough: Similar levels, up to 600 ppm, are also effective in fermented dough-style flavors.

Rum: Rum flavors are just about as contrarian as beer flavors and confound expectations. Light rum flavors work well with levels around a thousand ppm, but dark rum flavors only need around 200 ppm.

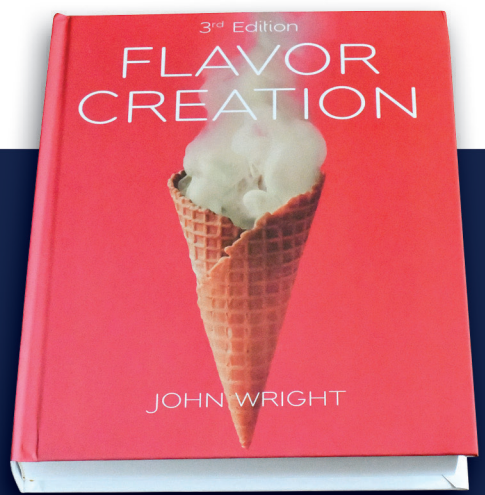
Whisky: Whisky flavors, in contrast, are quite predictable. One thousand ppm of decanoic acid is a good level of addition.

Wine: Red and white wine flavors are both subject to the same considerations. A relatively mature profile is usually the objective and 200 ppm of decanoic acid is perfect.

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

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

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



Savory Flavors

Bacon: Decanoic acid plays an important role in many savory flavors, with the balance of effects shifting more to taste than aroma. Bacon flavors are typical, with 3,000 ppm representing a good starting point.

Beef, Roast: The same 3,000 ppm level is also highly effective in roast beef flavors. Levels in boiled beef flavors may be a little lower.

Chicken: Most chicken flavors are a bit more delicate and 1,000 ppm is entirely effective. Higher levels can work in very fried profiles.

Ham: Ham covers quite a range of profiles, some fatty, some not. The best level of addition of decanoic acid can be difficult to tie down, but 1,000 ppm is a good starting point.

Lamb: Lamb flavors, in contrast, always have a notable fatty acid element. Decanoic acid never takes the lead role and 700 ppm works well in conjunction with other aliphatic acids.

Pork: Two thousand ppm of decanoic acid is generally ideal in pork flavors.

Seafood: This ingredient works well in most seafood flavors. Moderate levels, around 500 ppm, are good in fatty fish flavors such as salmon. Lower levels, in the region of 100 ppm are better in most other types of seafood.



Pomegranate flavors are currently popular and have a significant taste component. Two hundred ppm of decanoic acid is ideal.

Smoke: In contrast to most other savory flavors, decanoic acid only plays a modest part in smoke flavors. Two hundred ppm adds useful depth of taste, but little aroma.

Fruit Flavors

Apple: Apple flavors tend to be on the lighter side and can usually benefit from a little additional taste effects. Eighty ppm of decanoic acid is helpful

Blueberry: All berry flavors gain authenticity from background taste effects, often naturally associated with the skin profile. This is particularly true of blueberry flavors. Two hundred ppm of decanoic acid is a good starting level.

Pomegranate: Pomegranate flavors are currently popular and have a significant taste component. Two hundred ppm of decanoic acid is ideal.

Strawberry: Decanoic acid would never be a first choice amongst aliphatic acids for strawberry flavors, but it can play an interesting secondary role at around 50 ppm.

Tangerine: Decanoic acid might seem to be a very odd recommendation for citrus flavors. That would be true for normal levels of addition, but a hint, around ten ppm, can add depth, especially in tangerine flavors.

Other Flavors

Caramel and Toffee: Given the obvious dairy content, decanoic acid clearly plays an important part in caramel and toffee flavors. Levels vary dramatically, but four hundred ppm is a reasonable place to start.

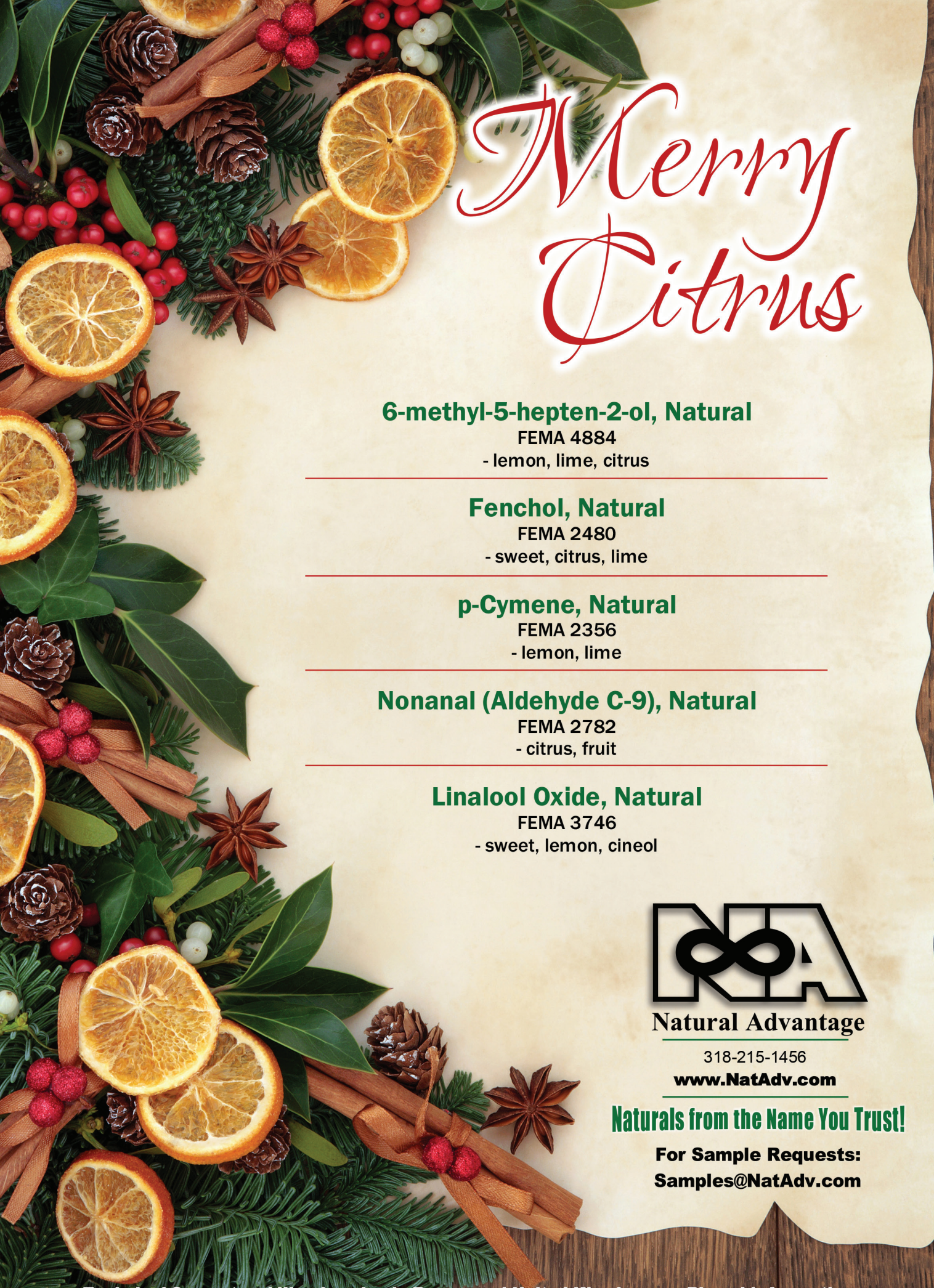
Chocolate: Very much the same comments apply to milk chocolate flavors, and a similar level of five hundred ppm is equally effective.

Coconut: This ingredient is a vital contributor to all coconut flavors. Levels vary slightly according to the style, coconut water flavors only need around 1,000 ppm but most other styles work better with 2,000 ppm.

Hazelnut: Decanoic acid can help deepen all nut flavors, but this is particularly evident in hazelnut flavors. One hundred and fifty ppm works well.

Olive: Creating realistic olive flavors presents an interesting challenge. Decanoic acid can be a helpful, if not essential, contributor at around 200 ppm.

Vanilla, French: Decanoic acid only plays a very modest role in vanilla bean flavors, but around 400 ppm helps French-style vanilla profiles.



Merry Citrus

6-methyl-5-hepten-2-ol, Natural
FEMA 4884
- lemon, lime, citrus

Fenchol, Natural
FEMA 2480
- sweet, citrus, lime

p-Cymene, Natural
FEMA 2356
- lemon, lime

Nonanal (Aldehyde C-9), Natural
FEMA 2782
- citrus, fruit

Linalool Oxide, Natural
FEMA 3746
- sweet, lemon, cineol

Natural Advantage

318-215-1456

www.NatAdv.com

Naturals from the Name You Trust!

For Sample Requests:
Samples@NatAdv.com

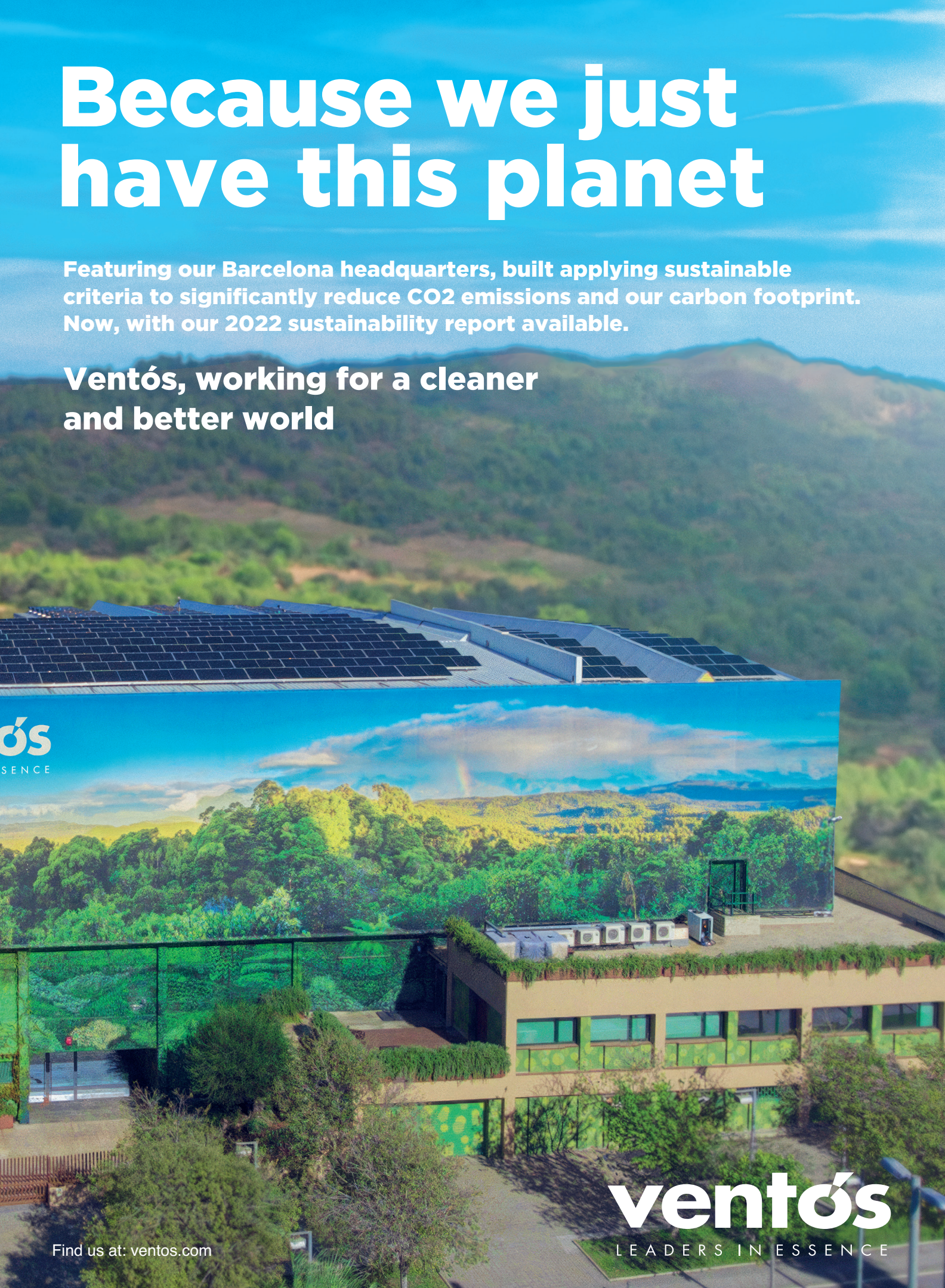
Technical Support and Warehousing in Europe and United Kingdom see RiversideAromatics.com


ventos
LEADERS IN ESSENCE
vento
LEADERS IN ES

Because we just have this planet

Featuring our Barcelona headquarters, built applying sustainable criteria to significantly reduce CO2 emissions and our carbon footprint. Now, with our 2022 sustainability report available.

Ventós, working for a cleaner and better world



Find us at: ventos.com

ventós
LEADERS IN ESSENCE

BEHIND THE BUZZ OF B CORPORATIONS IN FLAVOR

Outlining the finer points of B Corporations as it relates to the flavor industry.

BY SHANE MCDONALD, PH.D., principal scientist, Natural Taste & Sensory Solutions, Kalsec, Inc.



Breaking down the areas of convern in the flavor industry and how they correspond with B Corporation Certification.

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

Environmental, sustainability, ethics and diversity issues are increasingly important not only to consumers, but also to employees and other stakeholders in the flavor industry. They want to know if the company they are working for, selling to, or purchasing from is a "good citizen" and holds the same values as they do. But how do you know if a company is "walking the walk?" And how does a company effectively communicate its values?

An excellent way to do this is by becoming a B Corporation, also referred to as a "B Corp." B Corporations are for-profit businesses that use their business as a force of good. They emphasize a holistic approach with a common Theory of Change:

- Stakeholder Economy: People and the planet must be of equal, or higher, value than short-term profits.
- Racial Equity: True racial justice requires listening and learning.
- Climate Justice: There is no "Planet B." Humanity depends on our planet to survive, and the planet depends on humanity.

Globally there are currently over 6,200 B Corporations. Including some food ingredient and food manufacturing companies.

Areas of Concern Unique to the Flavor Industry

The flavor industry is renowned for processing numerous raw materials from all over the world. Some extracts may come from small farmers in developing countries, or from a site at risk of deforestation. Is the harvest sustainable? Can the farmers make an adequate return for their labor? What is the impact of climate change? The impact of population growth and the effect on wildlife? Biological diversity? What is the environmental impact of getting the materials to the factory? Are there any concerns about labor practices? These questions are important throughout the value chain, from farmers to flavorists.

> "Companies need to be aware of all their activities and impacts, both positive (to earn credit in the assessment) and negative (areas of opportunity for improvement to demonstrate continuous improvement)."

These questions also refer to flavor chemicals. Are the plants grown in an environmentally friendly manner? What is the carbon footprint? Are the chemicals safe and free from contamination? Are working conditions healthy and respectful of the workers? Are there problematic ties to parties of concern, such as military dictatorships, corrupt organizations, or organized crime? Can the chemicals be safely transported to the next location?

Flavor extraction processes involve many inputs, such as raw materials, extraction solvents, energy and labor. Improving extraction efficiency, "green solvents," renewable energy and worker safety are



crucial. It's also worth considering what is left in the biomass after extraction. In many cases, the spent material is landfilled. Are there ways to get more valuable products from the spent material rather than disposal? Better alternatives may be composting, upcycling for animal feed, or repurposing for biofuel.

Opportunities exist to reduce carbon footprints and especially volatile organic compound emissions. Emissions can expand carbon footprints, cause unpleasant or unsafe aromas and may have other negative environmental impacts. Water usage is another major concern, with water being increasingly expensive, and a factory's usage competes with environmental, residential and agricultural concerns in what is no longer a plentiful commodity. The flavor industry strives to use less water and at the same time be very careful about wastewater.

Despite the environmental challenges of spent resources and landfills, companies are responsible for a lot of waste. This includes packaging, spent materials, manufacturing waste, and used office supplies. Many companies strive for a "zero landfill" policy using recycling, composting, reuse, valorization of waste, smart purchasing, and repairing equipment rather than replacing it with new machinery.

There are also social responsibility aspects of the industry, such as diversity and equity in hiring practices, working with small and local vendors to strengthen the local economy, and community support through corporate-sponsored charitable giving and employee volunteering.

These considerations and more are analyzed in a B Corp impact assessment. Companies need to be aware of all their activities and impacts, both positive (to earn credit in the assessment) and negative (areas of opportunity for improvement to demonstrate continuous improvement).

5 B Corp Benefits

Earning B Corp certification is a rigorous process, but it is well worth the effort. Some of the benefits include:

1. Your company has an objective assessment of its impact and can make sure its values are aligned with reality. This can be useful for future improvements.

2. B Corp status can be used as a communication tool, to let vendors, customers, and other stakeholders know that you take your values seriously.

3. This can raise awareness of your company to customers and vendors that you would most like to do business with and lead other companies to yours.

4. It can lead to more sustainability in use of raw materials and resources, and better positioning in the community.

5. It can be used to attract and retain employees who are looking for a company that provides meaning and a paycheck.



Despite the environmental challenges of spent resources and landfills, companies are responsible for a lot of waste.

Creating with purpose



Givaudan

Human by nature

Follow us on Instagram

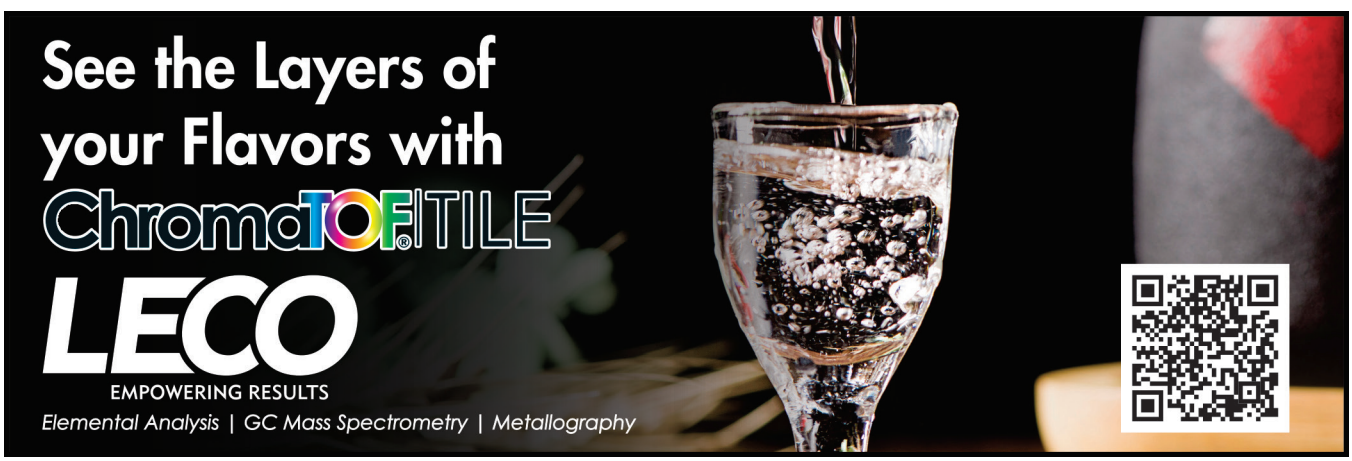


There are also social responsibility aspects of the industry, such as diversity and equity in hiring practices, working with small and local vendors to strengthen the local economy, and community support though corporate-sponsored charitable giving and employee volunteering.

How to Become a B Corp

Companies interested in becoming a B Corp undergo an online assessment that covers five categories: governance, workers, community, the environment and customers. The interactive form is customized as it is completed to ensure relevance to the specific company. Each business is compared to others in the field and rated with a score; applicants also receive recommendations on how they can improve their scores. Earning at least 80/200 allows access to converse with a B Local affiliate to further refine a plan tailored to the unique company. Certified B Corporation status is granted after a rigorous audit and receipt of an annual fee based on company revenue. Recertification occurs every three years, and B Corps must demonstrate improvement over the previous assessment to remain eligible.

Notably, a company's assessment report is available online for full transparency about its values, strengths and weaknesses.



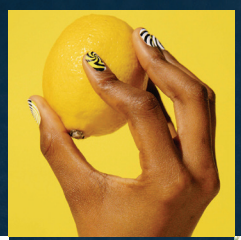
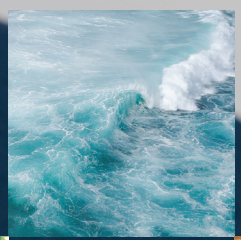
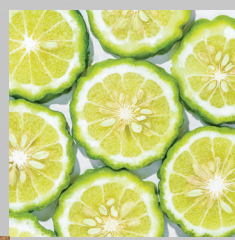
WPC

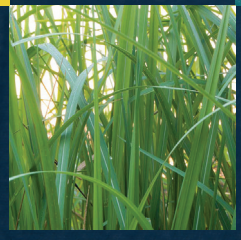
2024 WORLD PERFUMERY CONGRESS

The Sensory Event for Fragrance Leaders

June 25-27, 2024
Geneva, Switzerland

FRAGRANCE FORWARD: WHERE GLOBAL INNOVATION AND CREATIVITY MEET




HOSTED BY perfumer & flavorist

PRESENTED BY American Society of Perfumers

PRODUCED BY Allured business media



While Yuzu can be confused as a lemon or lime, there is a noticeable difference in flavor profile.

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

HOW A FLAVORIST ADJUSTS TO FLUCTUATIONS IN THE CITRUS INDUSTRY





A self-proclaimed citrus groupie shares workarounds for ingredient shortages as a flavorist.

BY CYNDIE LIPKA, principal flavorist, Bell Flavors & Fragrances

If data suggests anything it's that people really like citrus products and profiles. I'm not naïve enough to suggest that everyone likes citrus products equally across the board but I'm pretty sure that most people love one form of citrus or another. I for one, am a citrus groupie. Mintel[a] tells us that 67% of the United States population has tried and likes citrus profiles in desserts and confections. And if we look at TikTok, we see that #citrusfruit[b] has gathered 4.8 million views and over 24,000 Instagram posts exist as well.

We also know that the orange oil industry in the United States will see its lowest production of oranges for the 2022/2023 season in over 80 years thanks to a combination of citrus greening, a January freeze and two hurricanes called Ian and Nicole. In Argentina, they are anticipating a reduced crop by 20% for lemons from the previous year. The lime crop from Mexico will also be lower in the 2022/2023 year due to lower yields from lack of rain and perhaps some cartel influence over workers and product. More on that **on page 38**.

So, what is a citrus devotee such as me to do? Well, we can cast our eyes upon some new citrus fruits that are at various stages of acceptance in the United States.

Yuzu

Yuzu is a fine example of a fruit showing up in the adoption phase. It shows up on about 5% of menus across the United States. It was even featured in Better Homes and Gardens this year (wait, what??). Originally grown in China, production has migrated to Japan and Korea and has been prominent in their cuisines for hundreds of years. The Japanese typically use the rind as an addition to dishes, while Koreans will use Yuzu thinly sliced and craft a marmalade-type syrup for dishes or will use it in fruit punches. If you have tried Ponzu sauce, you have tried yuzu. Trader Joe's has a Yuzu ripple non-dairy frozen dessert that I would certainly vouch for.

While it can be confused as a lemon or lime, there is a noticeable difference in flavor profile. It's often called out as being herbal and or floral or called a cross between lemon and grapefruit with even mandarins and oranges have been mentioned. Yuzu is heavy in terpenes as you might expect

Click above to play

[a] *https://store.mintel.com/report/us-desserts-and-confections-market-report*
[b] *https://www.tiktok.com/channel/citrus-fruits?lang=en*

for a citrus fruit. Containing significant amounts of β-ocimene, β-myrcene, γ-terpinene, linalool, α-terpineol and of course limonene, yuzu peel oil might at first blush be confused for a lemon or lime when looking at compositional data. However, the presence of relatively high levels of linalyl acetate and something called yuzu lactone (FEMA# 4959), certainly differentiates this citrus from others.

Microcitrus Species Oil

Another beauty is Microcitrus species oil often called finger lime (or caviar lime as it's called in kitchens since the juice vesicles are tiny and round instead of droplet-shaped. Once cut open, the vesicles come out looking exactly like caviar.) Native to Australia, this citrus fruit is not round or oval in shape but more oblong resembling a finger in size, hence the name. The fruit itself can vary in color from green to rose to plum. And the vesicles can range from green to deep rose to pale pink to pearl in color.

Much like other citrus species the oil is prepared by cold pressing, separation and distillation. The finger lime season peaks in July through January. Finger lime is in the inception phase. A mere 1% of menus highlight finger lime and 10% of the population has tried it. But 31% of the population wish to according to Datassential[c].

The flavor profile of this citrus is again dominated by the terpenes such as β-myrcene, β-ocimene, α-farnesene, γ-terpinene, limonene, δ-elemene, β-bisabolene, germacrene D, α- and β-pinene, sabinene, δ-3-carene, and para-cymene. There is a decent amount of thymol in finger lime oil and so the suggestion that it tasted like citrus + rosemary is not unfounded. And I can easily see how this would play well with savory profiles that need some brightness.

[c]*https://issuu.com/syscocanadamarketing/docs/2023_food_trends_data_research_report-1_30_2023*



Calamansi can be eaten in any stage of maturation, and I would expect that the characteristics change during ripening much like the mandarin does.

Meyer Lemon

Next up on our hit parade is Meyer lemon. Datassential says that 26% of the U.S. population likes or loves it, 50% have heard of it while 32% have tried it. And in the past 12 months, there has been a 26% increase on menus. As we know, there are many citrus hybrids and Meyer lemon is no exception. She's a cross between a citron and a mandarin/pomelo hybrid originating from China. Meyer lemon is rounder than true lemon. Its peel is thinner, and darker yellow with a hint of orange to it when ripe.

Introduced to the United States[d] in 1908 as S.P.I. #23028 by the agricultural explorer Frank Nicholas Meyer who was an employee of the United States Department of Agriculture who had collected a sample of the plant on a trip to China. Though it is given his name, this variety was likely established thousands of years before he introduced it to America. By the mid-1940s Meyer lemon was grown all over California. However, it was discovered that the clones were symptomless carriers of a citrus virus that decimated the citrus industry worldwide. Obviously, the entire crop was destroyed and by the 50s, we found a virus-free form and certified it for release during the mid-70s.

The main component is limonene, followed by 1,8-cineole, isopulegol, linalool, myrcene, citronellal, and other green characteristics such as α-terpineol, terpinene-4-ol, and ocimene. It contains a bit less citral than most lemon oils.

Calamansi

Calamansi is still very much rooted in the inception stage of adoption. A mere 10% of the population has tried calamansi but 3% love it according to Datassential. The calamansi goes by many names such as kalamansi, the calamondin, Philippine lemon or Philippine lime, and yes, it's predominantly cultivated in the Philippines where it has been a food staple for quite some time. It is visually appealing and exotic to

[d]*https://academic-accelerator.com/encyclopedia/meyer-lemon*

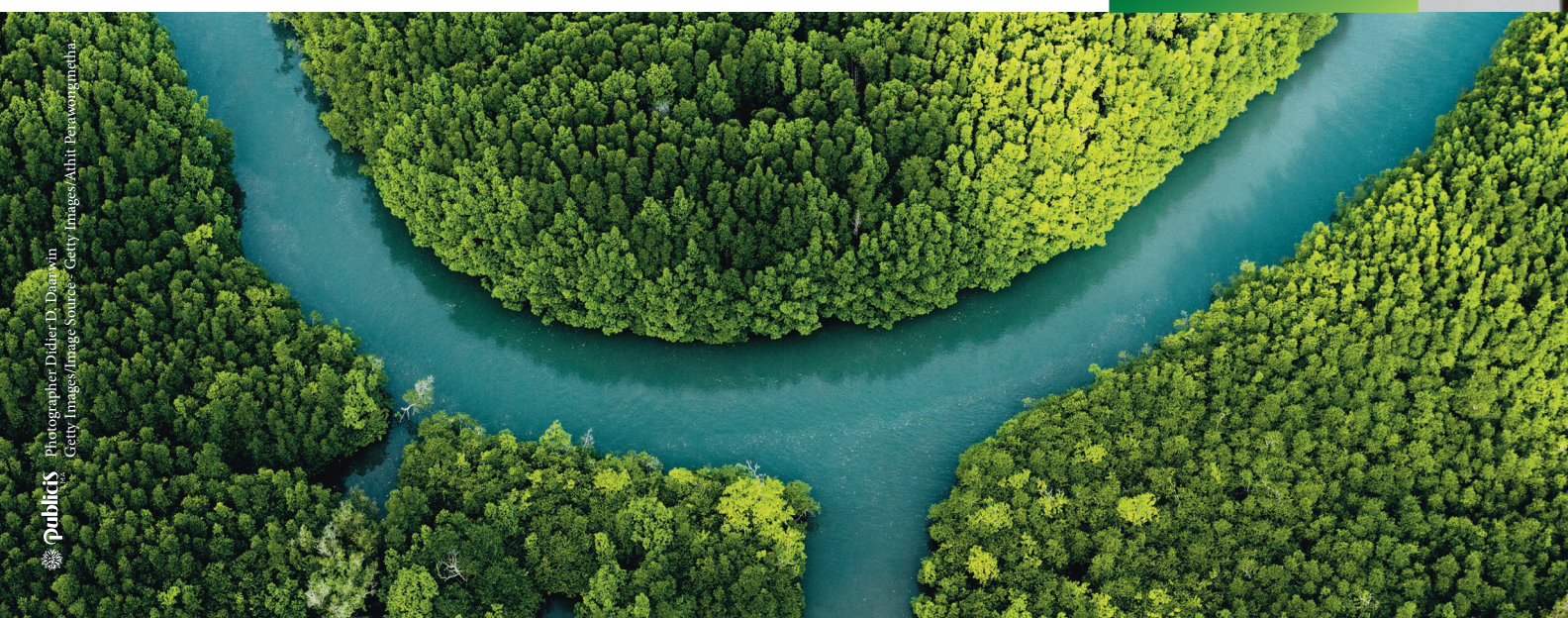


EXTRACTING
THE ESSENCE
OF NATURE'S MAGIC



WE
CAPTURE
WHAT
MOVES

MANE



Photographer Didier D. Daarwin
Getty Images/Image Source - Getty Images/Athiti Pearwongmetha

Westerners with a peel that morphs from the color of a lime and then ripens to orange and the inside pulp resembles that of a mandarin. It can be eaten in any stage of maturation, and I would expect that the characteristics change during ripening much like the mandarin does. Often described as a blend of lemon, lime and orange, calamansi is again a hybrid from kumquat and likely mandarin. (There you go!) The fruit is round and tiny at 1–1 ¾ inches in diameter.

This citrus is heavy in limonene at about 85% as you would expect, followed by β-myrcene, α-terpineol, β-pinene, linalool, 4-terpineol, and geranyl acetate lending an interesting floral note to its profile.



The pomelo is the fundamental ancestor of the grapefruit. It is a natural non-hybrid primarily growing in Southeast Asia.

Buddha Hand Oil

Buddha hand oil might yet be the most exotic-looking of all the citrus fruits. Buddha's hand is a variety of citron[e]; its full botanical name is *Citrus medica var. sarcodactylis*, the varietal derived from the Greek sarkos and dactylos meaning "fleshy finger." To me, it looks more like a thick Play-Doh representation of a flower with clusters of fat petals. Primarily comprised of limonene at ~67%, followed by 20% γ-terpinene, buddha hand oil then contains citral at just over 2% and then small amounts of β-caryophyllene, para-cymene both at less than 2% and then α-terpineol at about 1%.

Kaffir Lime

What's small, round and resembles a tiny green brain? A kaffir lime. Well technically, there aren't two hemispheres like a brain has but that's how I would describe the peel. Interestingly enough both the peel and the leaves have culinary uses. Citrus hystrix or the kaffir or makrut lime is indigenous to Southeast Asia. Most often the leaves are used in Thai (Tom Yum soup) and Cambodian (krueng bean paste) cuisines. The peel is often used in curry paste for astringency. In Cambodia, they lize the whole fruit to eat as candy. This is at a very early penetration stage, with only just over 1% presence on menus. Although quite some time ago, I did see a kaffir lime oil presented at a meeting. I remember thinking that it had a smokiness about it, that didn't quite jive with what I would expect citrus to be. Perhaps it wasn't the best sample available at that time.

Pomelo

Lastly, I'm going to chat about the pomelo (citrus maxima). Weighing in at 2-4 pounds and 6-10 inches in diameter, no wonder some people call this a monster of a citrus! It is the fundamental ancestor of the grapefruit. It is a natural non-hybrid primarily growing in Southeast Asia. The rind is thick, and the pith is also voluminous. The pith is generally discarded along with the segment membranes as they are very tough and generally unpleasant. So, we are left with the fruit and the peel. Menu penetration is low at about 9% of the population liking or loving it and 15% having tried it.

Despite the fruit being ancient, the data are remarkably new within the last 7-10 years. Limonene content ranged from 70-90% depending on the varietal. β-phellandrene ranged from 0.2% to greater than 12%. And the γ-terpinene ranged from almost 13.5% of the volatile constituents down to about 2%. Myrcene ranged from about 2-8%. So, while the data is representative of current supply, my impression is that there isn't quite enough to use as a guide to formulate with.

So, next time you are in the mood to switch up your run-of-the-mill citrus options, look to other cuisines to find your next new favorite. You might just be surprised by what you can find that becomes a new love!

[e]*https://www.marthastewart.com/1511028/buddhas-hand-citrus-demystifying*

perfumer & flavorist

flavorcon®

The Sensory Event for Flavor Leaders

SAVE THE DATE!



October 8-9, 2024

Harrah's Resort

Atlantic City, NJ



The volume of orange oil, terpenes, and d-limonene produced is directly related to the quantity of oranges processed for orange juice.

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

Highlights of IFEAT's Socio-Economic Report on Orange

Outlining orange production characteristics, trends, and challenges.

The health of the citrus market is vital for the flavor and fragrance industry. The orange market has been faced with a variety of challenges ranging from extreme climate conditions to competition for land use.

Below is a brief highlight from Peter Greenhalgh, Ph.D.'s Socio-Economic Report Orange[a] published by the International Federation of Essential Oils and Aroma Trades (IFEAT).

Production Characteristics

Global orange production for 2022/23 is expected to be 5% lower at 47.8MMT compared to the last crop owing to lower production in the European Union (EU), the United States, and Turkey, offset partly by a larger crop in Egypt. Fruits allocated to processing will be reduced, resulting in less orange oil production.

The actual amount of processing will be dependent on the value the processor can derive from the juice and orange oil produced. Brazil dominates orange processing but the dramatic fall in recent United States orange production means that for the first time in history, Mexico is the second largest orange processor, followed by the United States and the European Union.

The volume of orange oil, terpenes, and d-limonene produced is directly related to the quantity of oranges processed for orange juice. In 2022/23 orange juice production was estimated to be 9%

[a] *https://bit.ly/3FG37Y2*



All growers face major issues with changing climatic conditions and natural variability.



Citrus greening is having a major impact on the three major producers Brazil, Mexico, and the United States.

lower at 1.5 MMT (65 degrees Brix) - equivalent to almost 2 MMT of oranges.

Juice production fell because of the reduced fruit available for processing in the four major producing regions, namely Brazil, Mexico, the EU, and the United States. This in turn reduced the amount of orange by-products produced.

Major Production Challenges

There are several major challenges facing orange production and the industry:

- **Climatic variations** including frosts, droughts, heavy rains, and hurricanes have all seriously impacted production. These climatic factors reduce the fruit size and yields and hence the availability of fruit for processing and essential oil production.
- **Disease and pesticides**—oranges are susceptible to a range of diseases usually borne by insects that can substantially lower output. Greening is having a major impact on the three major producers Brazil, Mexico, and the United States.
- **Agricultural residue issues** arising from pesticide residues. The industry faces unclear regulation on pesticides residues and there is a need to coordinate accepted reference values to avoid market distortion.
- **Competition for land use**—in Florida the population and urbanization have increased, intensifying competition from the real estate sector. In Brazil land use competition comes from alternative crops particularly sugar cane, used for making biofuel. Moreover, sugar cane can provide a return within a year, whereas oranges not only have a gestation period of 3-4 years but also have added risks of greening and greater price volatility.

Future Production Trends

It is important to recognize that over the past century there have been sizeable shifts in orange oil production arising from economic, climatic, and other environmental factors which will continue to lead to shifts in the location of production. All growers face major issues with changing climatic conditions and natural variability while some major growers and processors, particularly in the United States and

Europe, face substantial pressure on land availability, combined with high labor and other costs.

In contrast in China, Egypt, and Turkey, the industry is reported to be growing and thriving but their dominant focus is growing fresh fruit. The supply of orange by-products depends, to a large extent, on the size of the orange harvest and the volume of fruit available for processing in countries where a processing industry is established.

Conclusions

The most lucrative part of the orange market is the sale of fresh oranges rather than orange juice or by-products generated from processing oranges. The market for orange by-products including orange oil and d-limonene is both a global and a volatile one with price levels similar throughout the world. Prices have increased significantly in the last few years. The combination of citrus greening, climatic factors, labor availability, competitive land usage, limited natural substitutes, rising production costs, lower aldehyde levels often below 1.1%, rising demand, and reduced stock levels all signal a paradigm shift in the market.

Orange production and processing, including the production of orange oil/d-limonene and terpenes, make vital economic, social, and environmental contributions to the orange producing regions in producing countries, particularly São Paulo (Brazil), Mexico, until recently Florida (USA), Sicily and Catania (Italy) and Valencia and Andalucía (Spain). The industry provides livelihoods for hundreds of thousands of people as well as generating millions US$ in sales and export revenues. In addition, the sector makes substantial environmental contributions, and initiatives are being adopted to combat climate change by capturing CO_2 as well as providing other environmental benefits.

“The most lucrative part of the orange market is the sale of fresh oranges rather than orange juice or by-products generated from processing oranges.”

Full Socio-Economic Report

For the entire Socio-Economic Report on Orange by Greenhalgh, visit *https://bit.ly/3FG37Y2*.

The full report discusses the growth characteristics, varieties, and range of orange products; the processing, uses and varieties; global trends in production and in major producing countries; major challenges, price trends, economic, social, and environmental aspects.

p&f

CALL FOR SAMPLES AND TECHNICAL INFORMATION

Now manufactured in Middletown, NY

NATURAL ACETOIN

(DON'T GET CAUGHT SHORT AGAIN)

NATURAL IONONES

NATURAL LACTONES

Fleurchem, Inc.

www.Fleurchem.com

33 Sprague Ave • Middletown, NY 10940 USA • Phone: 845-341-2100 • Fax: 845-341-2121

Pura to Take *World Perfumery Congress* 2024 Stage

Co-founder and CEO Bruno Lima joins chief fragrance experience officer Mara Dumski next summer in Geneva.



Pura's luxury partnerships include fragrance collaborations with capri BLUE, NEST New York, LAFCO and more.

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

The *World Perfumery Congress* (*WPC*)—presented by the American Society of Perfumers and produced by *Perfumer & Flavorist+* — is excited to welcome the smart home fragrance diffuser company, Pura, to the stage next summer in Geneva, Switzerland!

Launching in 2018, Pura was inspired by its founders' vision: empower people to control the scent of their homes anywhere, anytime, from the convenience of their smartphones. Pura's luxury partnerships include fragrance collaborations with capri BLUE, NEST New York, LAFCO and more.

In honor of *WPC* 2024's theme **Fragrance Forward: Where Global Innovation & Creativity Meet**, Pura co-founder and CEO Bruno Lima joins chief fragrance experience office Mara Dumski to discuss the company's journey, key partnerships as well as nuances of formulating for the smart diffuser.

Bruno Lima



Bruno Lima, co-founder and CEO, Pura

Bruno Lima is co-founder and CEO of Pura, the original smart fragrance diffuser. He grew up in Brazil, the number one fragrance market in the world, and learned from a young age to appreciate good scents and working for something powerful. He graduated with a BA in Manufacturing Engineering Technology from Brigham Young University and has always been passionate about creating, understanding how things work, and improving the consumer experience. His innovative mentality and constant desire to improve landed him in the 98th percentile of leadership effectiveness across the entire country and keeps Pura ahead of its' competitors and at the top of the industry.

Mara Dumski



Mara Dumski, chief fragrance experience officer, Pura

Mara Dumski, the chief fragrance experience officer at Pura, is known for her strengths in orchestrating fragrance and developing relationships. An Ohio native and lifelong performer, Dumski received her Bachelor's and Master's degrees in voice performance from the prestigious music school at Indiana University, leading her to New York City to pursue her career.

> "Notable Pura partnerships include Disney, Studio McGee, Anthropologie, Kenneth Cole and homesick."

Her impeccable attention to detail and extremely trained senses brought her into the fragrance world, beginning at IFF (International Flavors and Fragrances), where she worked for 25 years. Learning from and working side by side with some of the best perfumers in the world, she was taught how to smell with her musical ear, discovering the connection between all of her greatest passions and driving that into her career. Dumski has worked in fine fragrance, beauty care, personal care, and air care, and is largely ornamented with awards for her fragrances in all categories, with fine-tuned training to smell for skin and space. Her belief in the industry and its' potential brought her to Pura, after connecting with others who shared the same drive and passion for pushing boundaries and creating art through fragrance.

Dumski started with Pura in 2019 as VP of Fragrance to now chief fragrance experience officer, falling in love with Utah and the possibilities that scent has to offer in this unique aspect of fragrance.

World Perfumery Congress 2024

Scheduled for June 24-27 at Palexpo in Geneva, Switzerland, the event hosts an expo hall, networking opportunities and conference sessions. Sign up to be first on the list to learn about speakers, special features and more (*www.worldperfumerycongress.com*).

>>> Join the mailing list to receive updates about the upcoming event. <<<

WPC is the global stage for fragrance creativity, ingredients, technology and business—providing the ideal forum for discussing the industry's latest issues and breakthroughs.

p&f+



Low levels of davana oil opened Cyndie Lipka's eyes to new options such as tea (black, oolong and red), tamarind, wine, dark chocolate, brown sugar, Szechuan and ancho pepper, Worcestershire and tomato.



Flavor Materials Report

Flavorist panel evaluates 9-decenal, davana oil, mate absolute and more materials.

BY CYNDIE LIPKA
Principal flavorist,
Bell Flavors and Fragrances

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

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

Phenethyl Acetate, Natural

Source: Millipore Sigma
FEMA# 2857, CAS# 103-45-7
Natural occurrence: Apple, Asian pear, banana, beer, black currant, blue cheese, bread dough, capers, cheddar cheese, cherry, cider, cinnamon, clove, cocoa, date, grape, honey, plum, brandy, wine, rum, sake, sherry, strawberry, vinegar, whiskey.
Odor: @ 1%. Sweet, floral, slightly heavy, honey, brown, wine, fermented, beehive, mushroom and earthy as it dries out.
Taste: @ 1 ppm. Floral, heavy, generic rose, honey, cocoa, fermented, fruity.
Taste: @ 2 ppm. Heavy, floral, earthy, powdery, cocoa, soapy, fusel, bready.
Possible applications: This material can fit into many different profiles. It certainly fits into the floral fruits you would expect such as grape, blueberry, red apple, and strawberry. This would also fit into cinnamon, cocoa, chocolate, bread, honey, fermented profiles like wine. I was told during this session that this works well in tomato profiles as well. You might tempt me to evaluate mushroom flavor as well!
➤**Millipore Sigma:** *www.omegaingredients.co.uk*

1,3E,5Z-Undecatriene

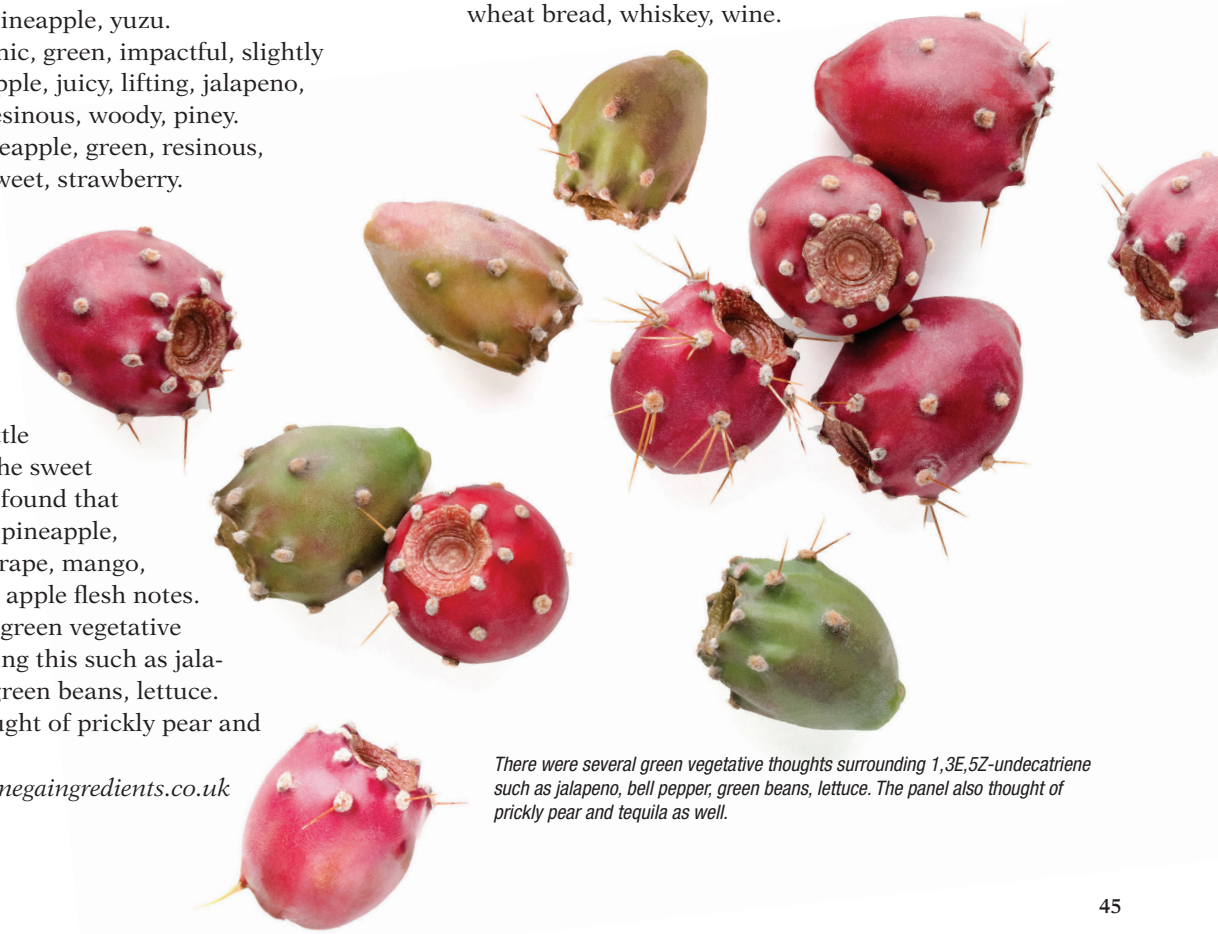
Source: Bedoukian
FEMA# 3795, CAS# 16356-11-9
Natural occurrence: Pineapple, yuzu.
Odor: @ 0.01%. Terpenic, green, impactful, slightly fruity, musk, pineapple, juicy, lifting, jalapeno, galbanum, fresh, resinous, woody, piney.
Taste: @ 0.01 ppm. Pineapple, green, resinous, vegetative, piney, sweet, strawberry.
Taste: @ 0.02 ppm. Pineapple, waxy, galbanum, grassy, green, fresh, vegetative, peppery, sweet, strawberry.
Possible applications: What a powerful little terpene this is! In the sweet category, the panel found that this would work in pineapple, strawberry, white grape, mango, bubblegum and for apple flesh notes. There were several green vegetative thoughts surrounding this such as jalapeno, bell pepper, green beans, lettuce. The panel also thought of prickly pear and tequila as well.
➤**Bedoukian:** *www.omegaingredients.co.uk*

Davana Oil

Source: Vigon
FEMA# 2359, CAS# 8016-03-3
Odor: @ 1%. Sweet, brown, cooked fruit/jammy, dried fruit, animalic, hay, floral.
Taste: @ 1 ppm. Sweet, brown, slightly waxy, dried, fruit leather, barnyard, animalic, fermented, juicy.
Taste: @ 3 ppm. Sweet, brown, tea (black, oolong), dried fruit leather, barnyard, animalic, floral, berry juicy.
Possible applications: Oh, davana oil! There are so many ways I love thee! I have historically associated this oil with cooked fruit (peach, raisin, prune, apple) and dried fruit such as raspberries, blueberries and cranberries, and also pomegranate, apricot, plum, black cherry, and black currant. But these low levels opened up my eyes to new options such as tea (black, oolong and red), tamarind, wine, dark chocolate, brown sugar, Szechuan and ancho pepper, Worcestershire, and tomato.
➤**Vigon:** *www.omegaingredients.co.uk*

Ethyl Phenylacetate, Natural

Source: Millipore Sigma
FEMA# 2452, CAS# 101-97-3
Natural occurrence: Apple brandy, capers, cocoa, grape brandy, guava, honey, lychee, macadamia nut, musk melon, papaya, passionfruit, peas, pineapple, plum, sake, sherry, vinegar, wheat bread, whiskey, wine.



There were several green vegetative thoughts surrounding 1,3E,5Z-undecatriene such as jalapeno, bell pepper, green beans, lettuce. The panel also thought of prickly pear and tequila as well.

Odor: @ 1%. Sweet, brown root beer, floral, honey, heavy, powdery, anisic, mothball, rosey, chocolate, fermented and plastic on dry out.
Taste: @ 1 ppm. Sweet, floral, brown, honey, powdery, rosey, bready, chocolate, bitter at end.
Taste: @ 2 ppm. Sweet, floral, brown, honey, chocolate, musty, powdery, pineapple bready, jammy.
Possible applications: It was interesting to taste these two back-to-back. The panel found that this would fit into many sweet browns like honey, cocoa, tropical and root beer. It too contained a fermented quality which would work well in merlot and other red wines, and also in grape, pineapple and pina colada and other tropical profiles.
➤**Millipore Sigma:** *www.omegaingredients.co.uk*



To not point out the obvious, the panel found uses for 9-decenal in fatty and waxy arenas.

δ-Cadinene, Natural

Source: Isobionics/BASF
FEMA# 4967, CAS# 438-76-1
Naturally found: Ambrette seed oil.
Odor: @ 1%. Dry, herbal, seedy, slightly soapy, waxy, ambrette, warm, spicey, cedar, woody, thyme.
Taste: @ 0.2 ppm. Dry, slightly brown, herbal, non-descript spice, slight tingle, black pepper, light, woody.
Taste: @ 0.5 ppm. Dry, herbal, piney, slightly oxidized citrus peel, woody, herbal.
Possible applications: There are a lot of different directions for this one. One area of interest would be used in berries for seed notes. Because of the warm brown but not sweet or directional in character, some saw this working in bread, yeast, grains, pie crust and possibly cookie flavors. Other thoughts were with adult profiled banana flavor or zesty citrus profiles. And even in gin and whiskey profiles. Other avenues were definitely with the woody herbal, thyme, oregano, spice blends, black pepper, and parsley notes. There is a very good carrot and tomato impact on dryout.
➤**Isobionics/BASF:** *www.omegaingredients.co.uk*

9-Decenal

Source: Bedoukian
FEMA# 3912, CAS# 39770-05-3
Natural occurrence: Coriander leaf oil.
Odor: @ 0.01%. Waxy, citrus, herbal, green, lemon, fatty, musty, rose, dirty, melon, rindy.
Taste: @ 0.005 ppm. green, herbal, cilantro, fatty, plastic, waxy, musty, mealy, cucumber rind.
Taste: @ 0.01 ppm. Herbal, soapy, rose, plastic, green, melon, waxy, musty, rindy, cilantro.
Possible applications: I'm guessing that everyone is expecting the panel to say anything with coriander leaf or cilantro including guacamole flavors. And while that is true, we also found uses which certainly land in fatty and waxy arenas. For fat, we found this would help beef tallow, lard, lamb and possibly at a very low level in dairy profiles. The waxy fruit/vegetable category could also be represented with uses in citrus peel, pineapple, melon, cucumber and melon skin.
➤**Bedoukian:** *www.omegaingredients.co.uk*

Mate Absolute

Source: Robertet
FEMA# 4969, CAS# 73296-98-7; 68916-96-1
Odor: @ 1%. Tea, dry, leafy, hay, earthy, leather, astringent, herbal, animalic.
Taste: @ 10 ppm. Leathery, dry, hay-like, tea, brown slightly dirty, earthy, mild, sweet.

Taste: @ 20 ppm. Earthy, herbal, mushroom, tea, leathery, astringent, herbal.
Possible applications: Of course, we all thought of tea due to profile and astringency of Yerba Mate absolute. And use levels can be much higher than cited here. Other sweet brown applications we thought of included maple, molasses, brown sugar and tamarind. But this could also fit into dry powdery flavors as well and we were thinking of ground spices, chili peppers, hops, and seaweed or briny flavors.
➤**Robertet:** *www.omegaingredients.co.uk*

Sesame CO_2 Extract

Source: Vigon
FEMA# N/A, CAS# 8008-74-0
Odor: @ 1% PG. Subdued roasted, nutty, brown, seedy, woody, oily, musty, peanut shell.
Taste: @ 0.5 ppm. Nutty, mild roasted, beany, astringent, brown, hulled, oily, fried, waxy, metallic.
Taste: @ 10 ppm. Directionally nutty, brown, sweet, cereal, waxy, astringent, metallic.
Possible applications: We thought of almost all the different nuts: almond, peanut, hazelnut, cashew, macadamia and possibly pecan. But we also thought of browned butter, and cereal and oatmeal notes, fried potato, caramel, maple, roasted garlic and onion, stir fry flavors and beef, chicken and pork.
➤**Vigon:** *www.omegaingredients.co.uk*

Blackberry KIInote

Source: Omega/Robertet
FEMA# N/A, CAS# 73049-50-0
Odor: @ 100%. Berry, fresh, pulpy, fleshy, seedy, wild, juicy, floral, tea like, fruit leather, fermented, and slightly dry and brown on the dry out.
Taste: @ 0.05%. Seedy, dark berry floral, fruit leather, bright, juicy, fresh.
Taste: @ 0.1%. Tea-like, berry, astringent, seedy, sulfurous, fruit leather, fuzzy, floral, rounded, waxy, slightly cooked.
Possible applications: This is a lovely essence that would lend itself to the dark berries and the red berries and black cherry too. But the panel didn't disappoint in that we also thought of jam, raisin, plum, and tea!
➤**Omega/Robertet:** *www.omegaingredients.co.uk*

p&f+



Ad Index

Advertiser	Web site	Page
Agrumaria Reggina	*www.agrumariareggina.it*	15
Aurochemicals	*www.aurochemicals.com*	C3
Australian Native Products	*www.australiannativeproducts.com.au*	19
BASF	*www.care-chemicals.basf.com*	11
Berjé, Inc.	*www.berjeinc.com*	7
Elemental Container	*www.aluminumbottles.com*	14
Ernesto Ventos SA	*www.ventos.com*	24–25
Fleurchem, Inc.	*www.fleurchem.com*	41
Givaudan France SAS	*www.givaudan.com*	29
Hangzhou Grascent Co. Ltd.	*www.hangzhougrascent.com*	12
Indesso Aroma PT	*www.indesso.com*	13
John Wright	*www.johnrwright.com*	21
K.L. Koh Enterprise Pte. Ltd.	*www.klkoh.com.sg*	27
Leco Corporation	*www.leco.com*	30
Mane	*www.mane.com*	35
MG International Fragrance Company	*www.mgessentialingredients.com*	5
MilliporeSigma	*sigma-aldrich.com/flavors-fragrances*	C2
Natural Advantage	*www.natadv.com*	23
Penta Manufacturing Co.	*www.pentamfg.com*	C4
Pope Scientific	*www.popescientific.com*	47
Symrise	*www.symrise.com*	1
Vidara	*www.vidara.com/en*	17
Vigon International, Inc.	*www.vigon.com*	3





Vanillin, Natural

One product. Endless possibilities.

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

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

All natural - 99% pure.

aurochemicals.com | 1-866-875-AURO

auro CHEMICALS

The Natural Choice for Flavor and Fragrance Ingredients


Developing Better Products through Natural Chemistry
Happy Holidays from our Family to Yours
XMAS
Penta
4 Dedrick Place, West Caldwell, NJ 07006
Phone: (973) 740-2300 ■ Fax: (973) 740-1839
E-Mail: sales@pentamfg.com ■ Web: www.pentamfg.com
USDA
FEMA 100 A Century of Great Taste MEMBER
FDA APPROVED
CERTIFIED HALAL
Penta Manufacturing Company®
A Division of Penta International Corporation