

The Hornblower

NORTHERN CALIFORNIA INSTITUTE OF FOOD TECHNOLOGISTS







Activities Chairs Amanda Hu and Remi Nakai organized the annual Food Tech Club Holiday Mixer on December 1st, a department wide social, where undergraduates, graduate students and faculty all came together to enjoy a dinner and socialize. There was an ugly sweater contest, baking competition and photo booth. This year's mixer was a huge success with over 50 people attending.

UCD Food Tech Club: An Update

Submitted by Jonah Messinger

This fall has kept the UC Davis Food Tech Club busy, planning and hosting various educational and social events to further engage and educate food science students. After attending freshman orientation, the club fair and hosting a fall welcome meeting, the Food Tech Club is ecstatic to welcome over 30 new members to our club. Below are just some of the events the Food Tech Club has organized this fall.

Guest Speakers: President Saanya Gupta has coordinated four speakers to speak to club members at general meetings this fall. Two of those speakers are highlighted below:

 Bernadette Apostol, Product Development Manager at Starbucks, spoke to club members about her transition from quality assurance to product development, important life lessons she has learned throughout her career, and gave insight into the work environment at a company like Starbucks.

Scientist and Marketing Strategist at Flavor Insights (and editor of the Hornblower!), talked through the sometimes mysterious world of flavor, explaining what makes Flavor Insights stand out as a family-oriented company and the importance of flavor chemists. Jaime brought flavor alcohols and uniquely flavored drinks to allow members to smell and taste the exciting world of flavor.

Mentorship Program

Vice President Carol Jian

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Your 2023-2024 NCIFT Officers

IMMEDIATE PAST PRESIDENT Ellice Ogle

Ellice is a food technologist with experience in product development and food safety for consumer-packaged goods. She founded Tandem Food LLC, her company for food safety auditing, consulting, and

training for startups. Her industry experience includes SCS Global Services (Emeryville, CA), Sun Basket (San Jose, CA), and Nestle Ice Cream Research and



Ogle

Development (Bakersfield, CA). She has been an active member of NCIFT since 2017 and is excited to serve as NCIFT President to promote the value of our membership.

PRESIDENT

Dr. Zhongli Pan

Dr. Zhongli Pan is President of NCIFT, an Adjunct Professor in the Department of Biological and Agricultural Engineering, University

of California, Davis, CEO and Founder of AIVISION FOOD, and Fellow of Institute of Food Technologist and Fellow of American Society of Agricultural and



Pan

Biological Engineers. His research focuses on food and agricultural

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Current Officers of NCIFT

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Ms. WanChin Lim MycoWorks

Dr. Leigh Schmidt

Ms. Yanyao Yu Thrive Freeze Dry

Dr. Victor Hong

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Innovative Products and Services

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Ms. Yanyao Yu
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SPI Group

VOLUNTEER COMMITTEE CHAIR Dr. Poonam Bajaj

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EDUCATIONAL CHAIR Dr. Ashwini Wagh Clorox

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CSU San Jose Campus ContactDr. Xi Feng

2023

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Check out our website: www.ncift.org



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UCD Food Tech Club: An Update

Current Officers:

President: Saanya Gupta Vice President: Carol Jian Treasurer: Poll Zhang Secretary: Angelina Kim

Co-Activities Chair: Amanda Hu Co-Activities Chair: Remi Nakai External Relations: Jonah Messinger

Product Development Chair: Summer Plepalakon

Social Media Chair: Chloe Krashanoff

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worked with graduate student Lik Xian to create a new mentorship/mentee program that will pair undergraduate students with graduate students. After a successful welcome event for all participants, Carol and Lik are hopeful that this program will outlast both of them and serve as a vital resource for future students.

Industry Tours

On November 2nd, External Relations Chair Jonah Messinger brought twelve club members to tour the Galaxy Desserts/Brioche Pasquier factory in Richmond. Founder and Pastry Chef Jean-Yves Charon explained the company's history before leading everyone on a walk throughout the factory. It was a fascinating experience to see how everyone at Galaxy Desserts works to bring a touch of sweetness to the lives of thousands of people, and it was especially interesting to see the unique production line for their tiny croissants!

Food Demos

Product Development Chair Summer Plepalakon ran a deliciously interactive mac and cheese demo on November 17. Summer first gave a presentation explaining how the moisture content of differently aged cheeses affect how they melt and how temperature can make or break a cheese sauce, the key component of every good mac and cheese. After armed with the food science know-how, members then formed into teams and competed against one another to see who could create the best mac and cheese. In the end, the real winners were the judges who got to sample everyone's creation!

Welcome New Members

Eric Ansaldo Joanna Rossi
Maureen Cuthbert Maurice Sainte-Yves
Apramita Devi Mingyue Shen
Merritt Erickson Hareem Siddiqi
Ari Kenney Edgar Torres
Leslie Klein Ginna Wichmann
Sabina Miro Jessica Widjaja

Welcome New Student Members

Gianna Chan Karol Hanson Liana Feng Colleen McLeod Katja Friess Emily Steliotes



Zhongli Pan

I am honored and excited to serve as the new president of our esteemed organization. As we embark on this new year together, I want to take a moment to express my gratitude for your continued support and commitment to NCIFT.

I am passionate about fostering a strong sense of community within NCIFT. Networking events, young professional gathering and Supplier's Night will allow us to connect, collaborate and support one another. Together, we can create a vibrant and supportive network that enriches the lives and careers of all our members. I

encourage you to actively participate in our organization's activities. Your ideas, insights and contributions are invaluable to our collective success. I am eager to listen to your feedback and work together to make NCIFT a more impactful organization.

Once again, thank you for entrusting me with the responsibility of leading NCIFT. I am confident that, with your support, we can achieve great things together.

Warmest regards, Zhongli Pan Ph.D NCIFT President for 2023-2024



Jaime Lawrence

From the Executive Editor by Jaime Lawrence

As 2023 ends, I am extremely grateful for all the wonderful events that were put together by the NCIFT. There was so much collaboration, learning, and connection that took place. It makes me very excited to

step into 2024 knowing that there will be even more to look forward to. I would love to see our new memberships grow even more this year – and my goal is to bring in more

content to the pages of the Hornblower to keep our readers engaged and eager to see all the fascinating things our industry has to offer. All members are encouraged to send me articles of what they would like to see in our pages. I want to wish everyone a happy holiday season and a wonderful 2024. Feel free to reach out to me any time.

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Very respectfully, Jaime Lynn Lawrence Executive Editor of the NCIFT Hornblower

Your 2023-2024 NCIFT Officers

product processing engineering and postharvest technologies with more than 30 years of distinguished service in government, academia, and industry. He authored more than 400 scientific publications, patents (6 granted and 5 pending), 3 books and 31 book chapters.

MEMBERSHIP SECRETARY/ NEW PROFESSIONALS GROUP CHAIR Erin Evers

With a passion for food and food science, combined with a solid product development background;



Evers

Erin is a unique technical sales manager for the SPI Group sales team. Erin currently works with customers to achieve success by applying her food

science knowledge and working

through technical challenges. She is solidly committed to and an active member of the IFT community. Erin just renewed her CFS and is happy to be celebrating 10 years as a CFS!

TREASURER Dr. Nishtha Lukhmana

Nishtha is currently a Senior Scientist, R&I in the Product



Lukhmana

Development team at Premier Nutrition. She received her Ph.D. in Food Science from the University of Georgia, an M.Tech. and B.Tech. in Biotechnology, and a

diploma in Science Journalism. As a member of IFT for over 10 years now, she enjoys volunteering and making a meaningful impact toward the food science community. She is passionate about "paying it forward" and helping

professionals in the food industry and the academia by serving on the Editorial board for Scientific Journals and being active in the Membership and Recruitment Committee of Phi-Tau Sigma Honor Society of Food Science. She also serves as Chair of Communications Committee in the Women Resource Group (IFT) and supports the Mentorship Program for her alma mater, University of Georgia. Born and raised in India, Nishtha brings with her a rich cultural background and a global perspective.

DIRECTORS-AT-LARGE

DIRECTOR-AT-LARGE/ NOMINATING AND ELECTIONS COMMITTEE CHAIR Dr. John Frelka

John is currently working as a Senior Scientist on the Snacking Team at Del Monte Foods, in Walnut

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Creek, CA where he works primarily on Foodservice and Pineapple products. Prior to that, John was working as a Scientist at Ripple Foods, working on research and product development



for plant-based dairy products. John joined NCIFT in 2009 as a student at UC Davis and was involved with NCIFT through the Food Tech Club and Food Science

Frelka

Graduate Student Association while completing his B.S and M.S. in Food Science and Technology. Afterwards, John completed his Ph.D. at The Ohio State University, where he got more involved with IFT through the Student Association, serving in the student leadership in multiple roles throughout his time there.

DIRECTOR-AT-LARGE Dr. Xi Feng

Dr. Xi Feng is an associate professor



Feng

in the Department of Nutrition, Food Science, and Packaging at San Jose State University. He teaches Food Science-relevant classes, including Introduction of Food

Science, Food Chemistry, Chemical Analysis of Food, Sensory Evaluation Techniques, etc. His research focuses on flavor chemistry and the application of virtual reality in sensory evaluation. He has been an active member of IFT since 2015, and he is also serving as an editorial board member for Food Research International.

xi.feng@sjsu.edu

DIRECTOR-AT-LARGE Dr. Victor Hong

It was difficult deciding between being a chef and chemist, so when in doubt, select all! Victor became a Food Scientist, a profession where he could combine his love of food along with his talent for research



and development. With a Ph.D. in Food Science, Victor brings over 25 years of Food Science experience including product development, food safety, process

Hong process development and food marketing. Victor's portfolio of achievements include: over 50 new product introductions (with an emphasis on beverages and health products) into the marketplace, several proprietary food processes and lots of happy customers. Victor currently lives in San Jose, CA., is a father to 3 children. His hobbies include cooking, sports (retired Tennis player and now aspiring golfer), internet technology, cell phone technology, photography and marketing. Victor has a BS degree in Food Science from the University of California at Davis and MS and PhD degrees from Oregon State University.

DIRECTOR-AT-LARGE WanChin Lim

WanChin spent nearly 15 years working in the food industry with a focus on food safety, quality assurance, and regulatory compliance. She recently pivoted her career to focusing on the quality management system for biologics and pre-clinical studies. However,



Lim

she wants to remain active in NCIFT to give back to the community where she found her first passion in food science and technology.

COMMITTEE CHAIR Chrissy Patrick

Chrissy Patrick holds a Bachelor of Science in Exercise and Sport Science which encompassed sports



Patrick

nutrition. She has over 20 years in sales and marketing of pharmaceuticals and food ingredients. She currently works as a Sales Manager at ICL, a domestic

manufacturer of Phosphates and Sea Salt, covering the Western US, Canada, and Mexico.

Lunch and Learn Recap: Quantum Materials Nanosensors

by Jaime Lynn Lawrence (moderator for the event)

In September, Dr. Gong was hosted by the NCIFT to conduct

a lunch and learn to explain all the exciting work he and his team was working on. He was able to speak in depth about creation of his nanosensors and all the work that went into them. This fascinating nanosensor has the potential to be used in a wide range of food applications which could also help significantly increase the safety of foods to consumers.

Professor Cheng Gong is an assistant professor in the department of Electrical and Computer Engineering at University of Maryland, College Park. His research group focuses

on 2D quantum materials and devices. He is a recipient of the IUPAP Young Scientist Prize in Semiconductor Physics 2020. In

2022 Professor Gong won UMD's "Invention of the Year" for his innovative development of quantum material nanosensors for rapid monitoring of meat freshness. Also in 2022, Professor Gong was recognized by the American Chemical Society as Maryland's "Chemist of the Year". From 2014-2019, he was a postdoctoral fellow at UC Berkeley, where he pioneered the experimental discovery of the first 2D quantum magnet. He obtained



Outlook 2024: Flavor Trends

This first in a series of three trend articles surveys flavorists, chefs, trend-spotters, futurologists, and entrepreneurs to find out what flavors consumers will be looking for in the year ahead.

by Dana Cvetan (with permission from: Mary Ellen Kuhn, Executive Editor, Food Technology Magazine)

Consumers' desire to feel good is steering the direction flavors are heading, but not in the "eat-drink-and-be-merry" way. Health—of the body, mind, spirit, and planet—rather than hedonism (well, okay, maybe a splash of hedonism), informs what flavors consumers are expected to flock to in 2024.

"We'll continue to see heightened consumer demand for new food and beverage experiences that express [their] true desires, with unapologetic abandon for the flavors they deem tasty—in any format," while they simultaneously embrace health and wellness goals, declares Marie Wright, president, creation, design, and development, and chief global flavorist for ADM.

Flavor trends are deeply rooted in changing consumer



priorities, adds Soumya Nair, global consumer research and insights director for Kerry Group. "People want to be heard and feel seen in the food and beverages made available to them. Whether low- to no-alcohol, or vegan, or plant-based, consumers want to feel empowered to decide their personal priorities and have solutions that support their decisions."

Flowers Galore

Florals are, pardon the pun, blooming. Flavor Insights expects steady growth for botanicals like jasmine, rose,

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by Dr. Vivian Wu

The NCIFT Holiday Dinner/Meeting held at Callippe Preserved 8500 Clubhouse Drive, Pleasanton, CA on Dec. 7 2023, was a success. Everyone was welcoming, and we had a wonderful time. Dr. Jaime Reeves EVP, Product Development & Commercialization, gave a talk about "Will the Future Of Food Be Fermented? Insights Into Product Development & Consumer Communication Of Precision Fermentation" and shared her vollunteer experience in IFT. The food was good. UC Davis students handled the raffle wonderfully. Many contributed to the raffle and had fun. Everyone stayed until the end. The weather cooperated. I closed the program, thank everyone's support and participation, and wish everyone a happy holiday season.

NCIFT Holiday Dinner

Callippe Preserve, Pleasanton, December 7, 2023









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lavender, hibiscus, and eucalyptus in 2024, reports Jaime Lynn Lawrence, R&D application scientist for the flavor company.

"The key driver for these flavors is the booming presence of health and wellness. Our consumers want to be transported through flavors and feel good about what they are eating and drinking," Lawrence explains. With a heightened awareness of what they are consuming, they crave exotic and earthy flavors containing functional properties that promote gut health, mental acuity, and overall holistic health, she adds.

"Flavorful wellness" is how Chef Rob Corliss, founder of culinary consultancy ATE (All Things Epicurean) describes what's pulling consumers toward "feel-good foods" that he says include floral, citrus, tropical, and "complex spicy" flavors.

"The momentum hibiscus has been gaining these past years, with its colorful crimson, tart-vibrant flavor and versatility ... should continue to increase in 2024," Corliss says, advising its use in products such as beverages, granola, jams, jellies, candy, and more.

Antioxidant-rich hibiscus makes its appearance in several new product introductions. FrutaPOP's Hibiscus Rosé Wine frozen pop, or "poptail," pairs Leaves of Leisure herbal hibiscus tea and rosé wine. A limited edition for 2023, the warm-weather adult treats contain under 5% alcohol by volume (ABV).

Ruby Wellness, producer of fruit-sweetened, sparkling, organic, no-sugar-added, hibiscus flavored waters that are free from artificial additives or sweeteners, introduced its Fuji Apple Hibiscus and Berry Cherry Hibiscus sodas this spring. The company also makes hibiscus-flavored still waters.

Along with herbal and superfood flavors, as well as spices, florals are part of a larger plant-based trend that is associated with healthier choices that can offer health functionality, says Lu Ann Williams, global insights director at Innova Market Insights.

Florals have been increasing in popularity for a few years now, with cherry blossom, lavender, and rose popping up in applications, mainly beverages, says Erin O'Donnell, marketing manager for Florida Food Products. "We expect to see botanicals branch out of the health and wellness space into other areas—think orange blossom with salted caramel, rose with an indulgent coffee latte," or blends like yuzu honeysuckle, says O'Donnell.

Flavor Insights, which partners with companies to produce energy and hydration products, expects to see upcoming new product launches featuring hibiscus, dragon fruit, and guava.

Lavender and hibiscus are among the up-and-coming flavors associated with mood enhancement and relaxation; and cherry blossom is rising in popularity, with a distinct floral, sweet, refreshing, and botanical profile that works well in baked goods, teas, ice creams, cocktails, and nonalcoholic beverages, adds ADM's Wright.

Other emerging calming flavors associated with sleep and

relaxation include elderflower (which pairs well with Meyer lemon), honey blossom (with green tea), and lavender (with blackberry), says Philip Caputo, marketing and consumer insights manager for Virginia Dare.

While consumers may be drawn to florals for their fragrance and association with health and wellness attributes, they eventually find they enjoy their flavors, and those flavors often provide a differentiating factor to products, O'Donnell explains.

The rise of florals is actually a reemergence, albeit one that is a very long time coming, observes Morgaine Gaye, a London-based food futurologist. "Violet, lavender, rose—they're really old-fashioned flavors—but we're seeing a big trend toward nature, floral motifs, (and) edible flowers in food." The nature vibe, the outdoors, has been prominent since 2020, "when nature was all we had to soothe us," Gaye observes.

Boldly Unsweet

"Consumers say they want lower sweetness in favor of other flavors, and we see that in the marketplace with a shift from sweet to bold flavors," says Julie Johnson, president of HealthFocus, a market research firm and consultancy.

This trend goes beyond experimenting with flavor, crossing into medicinal plants and herbs that consumers identify as providing functionality and health benefits. The broader trend, Johnson explains, is that "consumers simply want products that make them feel good, however they define that."

Mango Chili Tepache from De La Calle! is one example, says Johnson. Tepache is a nutrient-rich, bubbly, ancient Mexican fermented beverage made from pineapple scraps. Another is Aura Bora sparkling waters in Lemongrass Coconut, Lavender Cucumber, Basil Berry, Peppermint Watermelon, and Cactus Rose (made with prickly pear and rose flower extracts).

Savory flavors will show up in category-blurring ways in 2024, says Jen Lyons, marketing manager at Sensient Technologies. She expects chefs to push the envelope with menu items like vegetable-forward cocktails, and desserts incorporating tastes typically associated with savory dishes such as herbs, spices, and even mild cheeses, to create unique and unexpected flavor profiles. "Imagine a balsamic vinegar swirled throughout a fig ice cream with small pieces of blue cheese, offering a delightful balance of sweet and savory in every bite," Lyons describes.

Last year's sweet and spicy, or "swicy" flavor profiles will go a step further in 2024, with more out-of-the-box combinations like sweet and bitter, sour and umami, and spicy and sour, says Shannon Cushen, director of marketing for Fuchs North America.

"The bolder, the better when it comes to innovating with unusual and unexpected flavor pairings," Cushen continues, "so brands should look to the ingredients that are gaining

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Assembly Bill 418: Health Consequences Associated with Food Additives

by Hailey R. Veeder (Department of Nutrition and Food Science, San Jose State University, San Jose, CA 95012)

NBC News published an article by Elizabeth Chuck, named, "California Legislature passes first bill in U.S. to ban food additives, including red dye No. 3". This article describes California's legislative branch taking steps to ban the food additives: red dye no. 3, brominated potassium bromate. vegetable oil, and propylparaben. This bill, entitled 'The California Food Safety Act', prohibits a 'person or entity from manufacturing, selling, delivering, distributing, holding, or offering for sale, in commerce a food product for human consumption' any of the above substances. Violations of this bill will be punishable by a penalty of \$5,000 for the first offense and \$10,000 for each additional violation. The bill was introduced due to 'safety concerns' for the public, especially low income families. The bill was signed by California Governor, Gavin Newsom, and will be the first bill to ban additives that are permitted by the FDA (Chuck, 2023).

In order to determine whether or not the California Legislature is making progress towards public health, it is important to understand what these food additives really are. First, it is important to note the Delaney clause which, "prohibits the FDA from approving the use of any food additive found to cause cancer in animals or humans" (National Academy of Sciences, 2016). Red dye no. 3 has been a topic of conversation for years, as it is banned from cosmetic products already. Studies on long term animal feeding have shown that red dye no. 3 causes adenomas and carcinomas of the thyroid gland. The CSPI and other groups have petitioned for the FDA to delist red dye no. 3 per the Delaney Clause (Center for Science in the Public Interest, 2022).

Additionally, a research article studied the toxic effects of potassium bromate. determining abnormalities were associated with the food additive. Specifically, an increase in the amount of potassium bromate given also increased chromosomal abnormalities such as fragment and sticky chromosome (Gokce, 2020). Brominated vegetable oil has also been known to cause harm in animals. A toxicology study done on rats demonstrated that there are increased tissue levels of both inorganic and organic bromine, and that the potential target organ is the thyroid (Woodling, 2022). Another study from the National Institute of Environmental Health Sciences discusses the negative health

effects of propylparaben. Using human breast epithelial cells as well as mice, DNA damage was discovered when treated with propylparaben (Dhangada, 2020). Research on these four additives demonstrates the health concerns that are associated with these food additives. Highly processed, packaged foods contain these additives more than any other foods. The target market for many of these foods is young children. As children eat these foods, they ingest the additives that are associated with these health risks, putting them at risk for health complications in the future.

After reviewing peer reviewed articles based on studies on these food additives, it is clear that these additives cause harm to humans when indested. As this bill has been signed by Governor Newsom, this will be the first time that the FDA has approved food additives that a state has not. By approving this bill, the FDA will essentially be 'challenged'. Passing this bill will not only protect the California public from some of the concerning food additives in highly processed and packaged foods, but it will also educate the public about some of the damaging effects of some of the food additives in our foods. This is a great first step in the right direction to creating safer food products for the public.

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in popularity for their complex and distinct flavor profiles."

Fuchs recently introduced its Back-to-Basics Collection, a limited-edition line of three seasoning blends created by the company's sensory scientist, corporate executive chef, and R&D team. Billed as "intensified" takes on the five basic tastes (sweet, salty, sour, bitter, and umami), it includes Peppered Cocoa Spice (dark chocolate, cardamom, and black pepper, providing a bitter profile with a dash of sweetness), Ultimate Umami Blend (dehydrated onion, champignon mushroom, garlic, tomato, green onion, red bell pepper, paprika, yeast extract, and soy sauce), and Tropical Sour Seasoning (sugar, citric acid, and malic acid).

Consumers' pursuit of products with health and wellness attributes could drive demand for the earthy flavors and functional properties of spices such as garam masala, cardamom, turmeric, and ginger in 2024, says

Flavor Insights' Lawrence.

Chef Corliss picks Pickapeppa Sauce, also known as "Jamaican ketchup" to potentially be the next sweet-sour-savory-spiced condiment to emerge as a flavoring for soup, as a marinade, and in barbecue sauce. Produced since 1921 by the Pickapeppa Company of Manchester, Jamaica, the sweet, sour, mildly spicy sauce is made from cane vinegar, sugar, tomatoes, onions, raisins, sea salt, ginger, peppers, garlic, cloves, black pepper, thyme, mangos, and orange peel, and is aged in oak barrels for a year.

Bitter flavors are becoming more prominent for a few reasons, including government-led public health initiatives, says futurologist Gaye. For instance, the U.S. National Salt and Sugar Reduction Initiative, supported by the New York City Department of Health and Mental Hygiene, was

New Professionals Group Hosts Event at Almond Board

Submitted by Rachel Zemser

On November 15th, A La Carte Connections (alacarteconnections. com) hosted a vibrant networking event sponsored by the Almond Board of California, transforming

the atmosphere with an almond-themed experience. Attendees were treated to an array of almond snacks and indulged in goody bags filled with almond products, including mini bags of almonds, Glow Beauty Fuel almond-based nutritional bars, and Health Bear Foods almond-infused oatmeal cups with blueberries.

The event commenced with an energetic 30-minute networking session, fostering connections among professionals. Following this, Rachel, the owner of A La Carte Connections, took the stage, sharing insights into her illustrious 30-year career and the journey that led her to become a consultant in the food industry. She delved into the challenges of being a consultant, providing valuable perspectives. The evening concluded on a delightful note as participants adjourned to Cheung Hing, a nearby Chinese restaurant, for a group dinner featuring shared family-style meals. The IFT New Professionals Group succeeded in its mission to bring together individuals with 10 years or less of experience in the food industry, creating a dynamic and enriching experience for all attendees.





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finalized in February 2021. It provides sugar-reduction targets for manufacturers and foodservice providers to use as part of a public health partnership to benefit Americans.

"Whichever way you slice it, we know sugar is not good for you," Gaye adds. The younger generations—more educated, exposed to the world's cuisines, knowledgeable about nutrition, sophisticated in their tastes, and protective of their health—tend (or at least strive) to balance healthy eating styles with careful, limited indulgences in sweet treats, she observes.

Apart from health considerations, bitter flavors are considered elevated and worldly. "When we choose bitter, we are saying 'I've got a sophisticated palate; I've been around," says Gaye.

And lastly, as we age, our taste buds die off and we can tolerate more complex and bitter flavors, she adds. With

10% of the global population now over the age of 65 and that number growing annually, bitter foods such as arugula and high-cocoa content dark chocolate continue to gain traction in the marketplace.

Healthful Signals

Flavors play an important role in influencing what consumers perceive as healthy, according to Innova, whose research found that consumers associated berries, summer fruits, nuts, and tropical fruits with health and wellness.

As one nut-based example, Innova points to the refrigerated CORE Keto Peanut Butter Chocolate plant-based keto bar with probiotics, prebiotic fiber, vitamin C, vitamin D, zinc, and 0 grams added sugar. CORE Foods describes the bar, with 3 grams net carbs, as "salty-sweet."

Authentic and genuine fruit flavors are hot now, says CONTINUED ON PAGE 10

Outlook 2024: Flavor Trends

Jasmin Masri, technical sales and marketing coordinator for Custom Flavors. "Juicy and sweet berry combinations are stealing the spotlight," especially flavor profiles such as black raspberry, goji-strawberry combinations, and açaicherry blends.

Showcasing açai in combination with dark cherries, blueberries, bananas, blackberries, and flax, Dole's Boosted Blends Berry Spark features frozen cubes that when blended with two cups of milk make a smoothie designed to "support brain and cognitive health."

Flavors with perceived wellness attributes are in high demand and will continue to be a driver in the new year, says ADM's Wright. Consumers are pursuing their personalized health and wellness needs, with many managing their holistic well-being through foods and beverages, she adds. According to FMCG Gurus Top Trends for 2023, 64% of global consumers describe their approach to health as proactive.

Ginger, lemongrass, and turmeric are perceived by consumers to support anti-inflammatory and digestive function, says Wright, who also believes emerging varietals like finger lime (also known as caviar lime), kumquat, and calamansi (a citrus hybrid between a kumquat

and a mandarin orange native to the Philippines), will ramp up their appearances in new product development.

"The enduring demand for healthy choices will continue to impact flavor development," says Innova's Williams. This will be particularly relevant in categories where consumers shop with health as a key priority, for example, plant-based foods or low/no alcohol beverages, but also where flavor can be used to highlight "healthier" alternatives such botanicals, she adds.

In that vein, zero-proof cocktailinspired flavors from Virginia Dare's flavor collection include Apricot Rosemary Bellini, Jasmine Mojito, Yuzu Lime Mule, Cardamom Spiced

Lemon Drop, and Marionberry Plum Spritzer.

Sustainability is another area to watch in flavor innovation, Williams adds. As it becomes increasingly important to new foods and beverages, innovators will be challenged to develop products that appeal to consumers on flavor but also meet important ethical values.

Florida Food Products is currently experimenting with an upcycled ingredient that is typically disposed of (making it a sustainable choice)—cascara extract, from the fruit that surrounds the coffee bean. Its unique fruity and brown flavor

profile works in a number of applications, says O'Donnell. "You can blend it with bright citrus fruits, or warm flavors like whiskey. We've even tried it in an apple cinnamon beverage that can be served warm or cold, like cider."

Cross-Cultural Communion

Consumers breaking free of pandemic restrictions are reclaiming their "thirst for adventure" via new takes on international flavors, says Kerry's Nair. "Third culture cuisine [the creation of new dishes and flavor combinations inspired by more than one culture] is unabashed, bold, tells a story, and creates an intercultural collaboration." Flavors and ingredients coming to the fore in unique creations, says Nair, include tikka sauce wings, za'atar wings, birria ramen, sashimi tostadas, tandoori masala pasta, wasabi/kimchi mashed potatoes, cheeseburger ravioli, and Vietnamese po'boys.

Another example of "authentic flavors reimagined," according to Innova, is Casa Verde Salsa De Elote Salsa Casera homemade corn salsa from Ponder Foods. Made in small batches with fresh produce, the salsa has "authentic flavor and texture," and boasts a "Mexican street food vibe," according to the company. Its ingredients include corn,

> coconut cream, water, lime juice, white onion, sea salt, avocado oil, garlic, chile de arbol pepper, red chili pepper, and green onion.

> "We continue to see consumers using food to explore different cultures and cuisines," observes Sensient's Lyons, who expects continued growth in the communion of culinary worlds. "We are seeing things like green curry risotto, tandoori chicken burger, Korean potato salad, and Japanese guacamole popping up on menus, exposing consumers to new cuisines and flavors in familiar dishes."

> Chef Corliss predicts the regional cuisines of Mexico's Oaxaca, Yucatán, and Mexico City, along with Southeast Asia's Thailand, Vietnam, and Malaysia will "provide a robust pipeline for

flavor innovation and development," in 2024. Showcasing some traditional flavors of Mexican cuisine, Jordan's Skinny Mixes debuted its Mexico-Inspired Syrups Collection, featuring Churro, Horchata, and Dulce De Leche flavors, in May 2023. They are targeted to consumers "who appreciate the flavors of the culture and want to add its historically sweet inspirations to their favorite beverages without all the unwanted calories and sugar," according to the company's press release.



Boba x Ice Cream's Salted Ube S'mores Ice Cream is a great example of a spin on a nostalgic flavor like s'mores with a trendy ingredient, ube. (Photo courtesy of Boba x Ice Cream.)



Antioxidant-rich hibiscus is highlighted in FrutaPOP's Hibiscus Rosé Wine frozen pop, which pairs herbal hibiscus tea and rosé wine. (Photo courtesy of FrutaPOP.)

CONTINUED FROM FACING PAGE

"My 2024 gaze is also cast on the Caribbean—Puerto Rico, Curaçao, and Trinidad and Tobago," Corliss adds. "The essence of Caribbean cuisine is perfectly poised to impact food and beverage development, as it pulls from indigenous culture and influences from Asia, Europe, the Middle East, Africa, and Latin America." The Caribbean amalgamation of culture, flavors, ingredients, and vibrancy provides a natural pathway to morphing with a broad spectrum of larger 2024 trend areas, he adds—new experience discovery, flavorful wellness, feel-good foods, freshness, citrus/tropical flavors, florals, and complex spicy tastes.

Corliss forecasts increasing popularity for Scotch bonnet, a fiery chili pepper that is sweeter than but closely related to habanero, and both dry and wet jerk seasoning for meats, vegetables, eggs, rice, and stews.

"Right now, consumers are showing interest in some of the more exotic global cuisines, like Ethiopian, Serbian, Moroccan, and Korean," says Fuchs' Cushen. "Brands really can't go wrong when it comes to global flavors."

International flavors take consumers on a "culinary journey across the globe, infusing products with the essence of various cultures and regions," says Custom Flavors' Masri. Italy, Spain, Asia, and South America are the main inspirations behind this trend, she says, contributing an array of sweet, fruit, and dessert flavors such as tiramisu, Sicilian lemon, churros dipped in chocolate, aromatic saffron-infused treats, matcha green tea, lychee, creamy dulce de leche, coffee, and passion fruit. According to FMCG Gurus' 2023 report, Flavor, Color & Texture in North America, 81% of North American consumers expressed a desire to try new flavors from around the world.

Newstalgia Mashups

"Newstalgia," classic nostalgic flavors with an updated twist, continues to influence flavor trends, says Sensient's Lyons. "Consumers are finding comfort in food mashups and are sentimental while yearning for a return to ... some

past period." These could manifest as updated versions of comfort foods from childhood elevated with a unique, exciting niche flavor, such as mac and cheese spiced with kimchi or pink lemonade with smoky chipotle, Lyons notes.

"We will continue to see more comfort nostalgic flavors and blurring of these flavors, such as alcoholic flavors inspiring sweet and savory foods, [and] dessert-inspired flavors in beverages and meals," adds Kerry's Nair.

Nostalgic flavors poised for 2024 prominence include Rocket Pop, rainbow sherbet, s'mores, and dipped waffle cone, says Flavor Insights' Lawrence. Thirty-eight percent of U.S. consumers like flavors that remind them of their childhood, according to a Mintel presentation titled "Unguilty Pleasures: A Data-Driven Forecast for the Next Big Indulgent Flavors," given at IFT FIRST in July 2023. Those percentages rise to 44% for males aged 35–54 and 41% for males 55 and older.

Among "Americana childhood flavors" with potential, Mintel named s'mores (Quaker DC Gotham City S'mores Instant Oatmeal), peanut butter and jelly (Target's Favorite Day Peanut Butter & Jelly Filled Cookies), and doughnuts (Jeni's Powdered Jelly Donut Ice Cream).

Mintel advises being inclusive of the nostalgia of different races and ethnicities, with examples like General Mills' Tres Leches Toast Crunch cereal and Brach's Desserts of the World jelly beans. In addition, Mintel urges "up-aging" and diversifying nostalgic flavors, pointing to lactose-free Boba x Ice Cream's Salted Ube S'mores Ice Cream, Hook Coffee's Give Me S'mores Coffee Drip Bags made with Indian coffee, hot chocolate, marshmallow, and spice flavors from Singapore, and Lavery Brewing Co.'s Grampa Apollo's S'mores Stout, brewed in small batches with graham crackers, chocolate, and marshmallows.

So, whether looking back wistfully for the comforts of the past or looking forward with hope for the future, consumers' priorities remain centered around physical health, mental health, and well-being, says Gaye. "And flavors and fragrances can provide comfort," in this quest, she adds.



In May, Jordan's Skinny Mixes introduced its Mexico-Inspired Syrups Collection, featuring Churro, Horchata, and Dulce de Leche flavors, for consumers that "appreciate the flavors of the culture." (Photo courtesy of Jordan's Skinny Mixes.)

The Well-Dressed Food Plant Worker

by: Richard F. Stier

An integral element of a food processors food safety and quality programs are how their plant workers are dressed. This entails what kind of shoes or shoe covers, pants, shirts, hair restraints, hats, masks and gloves that are mandated for the worker. How a processor elects to garb their people depends on several factors including the kinds of products being manufactured, the type of equipment that is used, the layout of the facility, and the history of problems with the products in question. But, the most important factor is the risk assessment focusing on clothing that is conducted by the processor's food safety team.

So, let's take a look on how a processor might decide to cloth their people. And, once this decision is made, it is imperative that part of the training for both orientations for new employees and refresher sessions for existing team members focuses on what clothing is mandated and why. Workers need to understand the importance of the clothing mandates.

The kind of products being manufactured is one of the most important factors that must be part of the equation when it comes to how workers are dressed. Ready-to-Eat (RTE) products are sensitive and potentially unsafe products as they are prone to post process contamination. Facilities manufacturing such products usually have different clothing requirements within the same facility since there is both a raw and processed side within that facility. These two areas may be physically separated. As an example, raw chicken may be prepared, cooked and frozen on one side of a wall and the packaged on the other side. The freezer may even extend from one side to the other. Workers on the "raw" side will be wear different colored uniforms than those on the processed side. In addition, the plants usually establish transition areas where persons entering one side or the other must change into the clothing required for that section, plus wash and maybe sanitize their hands.

On the other hand, persons working in a facility manufacturing carbonated soft drinks in a closed system where ingredients are mixed, held and packaged in a processing system where there is no exposure to the environment may be allowed to work in their street clothes. Again, it depends upon the results of the risk assessment conducted by the food safety team.

Now let's focus on the individual items worn by the workers starting with hair restraints. Most processors mandate that anyone working on the processing floor or in the warehouse wear a hair net. Ideally, the worker's hair should be fully contained within the hair net. To do this, many companies mandate that the hair net cover both the hair and the ears. Any male worker with a moustache or beard must also wear a snood or beard cover. And, the



plant must clearly state that any kind of facial hair must be covered. And, speaking of hair, if a plant mandates that a hat or cap be worn, such garments must be able to be washed. It is for this reason that many operations have now banned baseball caps. They are often quite dirty and worn by workers outside the processing facility. And, since we are discussing the head and face, what do we do about glasses? If a worker wears glasses, they should be shatterproof and if they are not, workers should wear eye protection. And, finally, what about masks? These were mandated during COVID, but should they be required? Again, it depends on the risk assessment. With a high-risk product like an RTE product, the company might mandate masks on the processed side.

What about shirts, lab coats, smocks and pants? First off, whether these garments are provided by the processor or they allow street clothes, the first requirement is that they be clean and in good condition. In addition, the processor must mandate that workers themselves are committed to personal hygiene. These garments must be manufactured from materials that are easily cleanable and not prone to fraying. Shirts, smocks, and lab coats should have no pockets, especially no pockets above the waist. Workers may be tempted to place pens or other items in shirts, lab coats or smocks with pocket above the waist. These items can easily fall out and end up in product. They should also be manufactured with no buttons. Velcro closures and snaps are preferred as they will not "pop off" and become a potential contaminant to food. When selecting garments, consideration should also be given to basic comfort. For example, selecting breathable yet easily cleanable fabrics would be more comfortable than buying shirts, smocks or lab coats made from something like rayon or polyester. I was once in a cannery who outfitted visitors in polyester lab coats. The hot, steamy environment in the facility had everyone sweating profusely within minutes.

And, what about shoes? Many operations provide workers with work shoes that have steel toes and shanks to

protect workers and are non-slip. These shoes are only for plant use and must stay in the workers locker. Some plants take extra precautions to minimize potential contaminants from shoes, especially those shoes that persons wear to and from work. They mount permanent benches in locker rooms that have work shoes on one side and lockers on the other. The plant worker removes his own shoes, outs on his plant clothes and then swings his feet over the bench to put on his work shoes. Any dirt or soil on the individual's shoes stays on one side of the bench. There are also operations that mandate that anyone entering the processing area slip an overshoe or boot over the shoes. And, again, how stringent the shoe policy is depends on the risk assessment.

There are different attitudes throughout the world on gloves. Many companies mandate that anyone handling food wear a glove. Others insist that proper handwashing for good handlers is adequate. If an operation mandates that workers wear gloves of any sort, they must be kept clean and in good repair. Now, there are operations in which gloves are mandated for safety. Workers in meat plants or any other operation where workers use knives to cut or trim products are outfitted with gloves made of materials such as Kevlar or mail to protect them from cuts.

The clothing policy must also address items such as jewelry, makeup, false eyelashes or fingernails. The standard policy for most plants is that workers are not allowed to wear any jewelry. This includes necklaces, rings, earrings, brooches, or anything else. Most facilities also ban visible piercings, which many state includes tongue piercings. Some operations allow workers to wear plane wedding bands but state that the worker must wear a glove over the ring. And, lastly, processors must develop a policy for medical alerts bracelets or necklaces. For the safety and well-being of the worker, they must be allowed, but must also be fully covered by a long-sleeve shirt with elastic wrist bands or under their shirt.

So, how are you going to outfit your plant workers? The prevailing theme for each element of what they must wear is risk, that is, what should be done to protect the product and ultimately the customer or consumer. There are other considerations, however. Having your people wear a standard uniform can help create esprit d' corps and enhance team building. This team spirit can carry over to the food safety culture that more and more companies are striving to build and maintain, so there may be more to dressing your plant workers than you think.

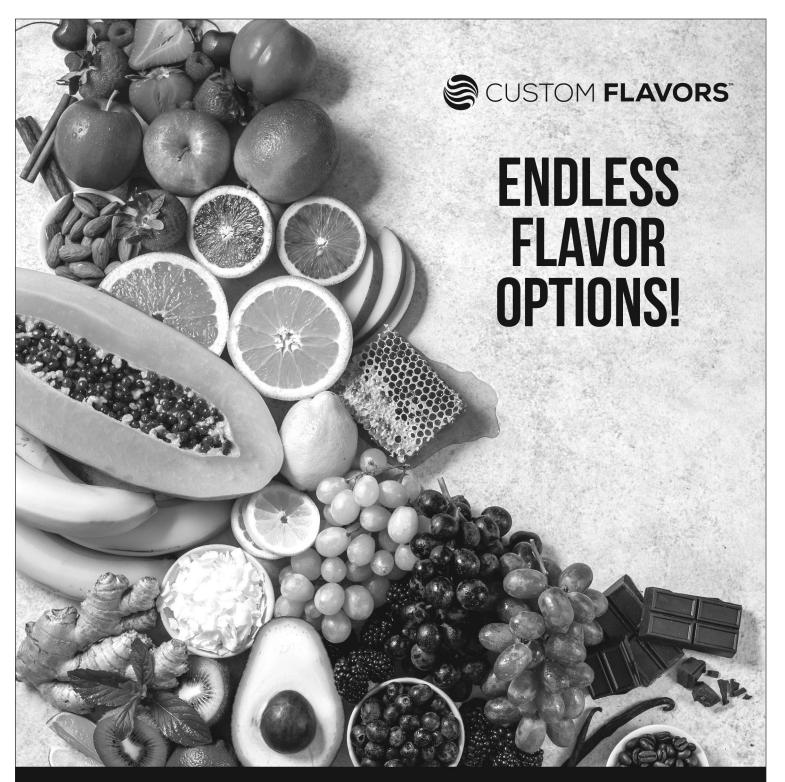
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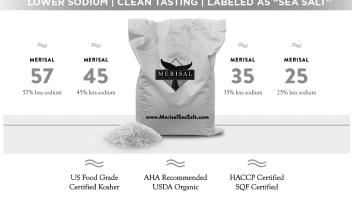
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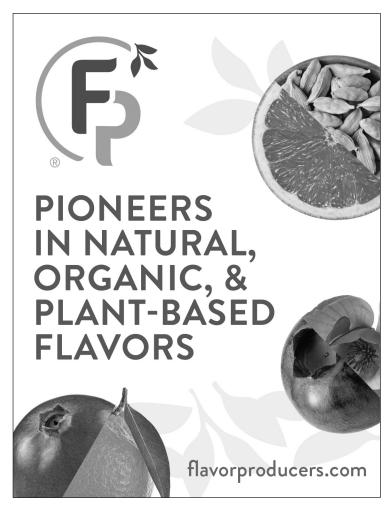
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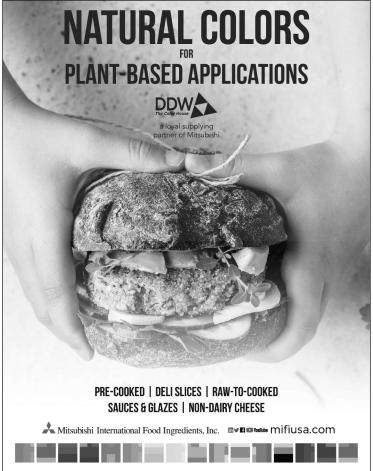
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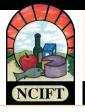


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