



International Citrus & Beverage Conference

Program & Abstracts

September 17-20, 2024

Clearwater Beach, Florida, USA

conference.ifas.ufl.edu/citrus

UF | IFAS Extension
UNIVERSITY of FLORIDA

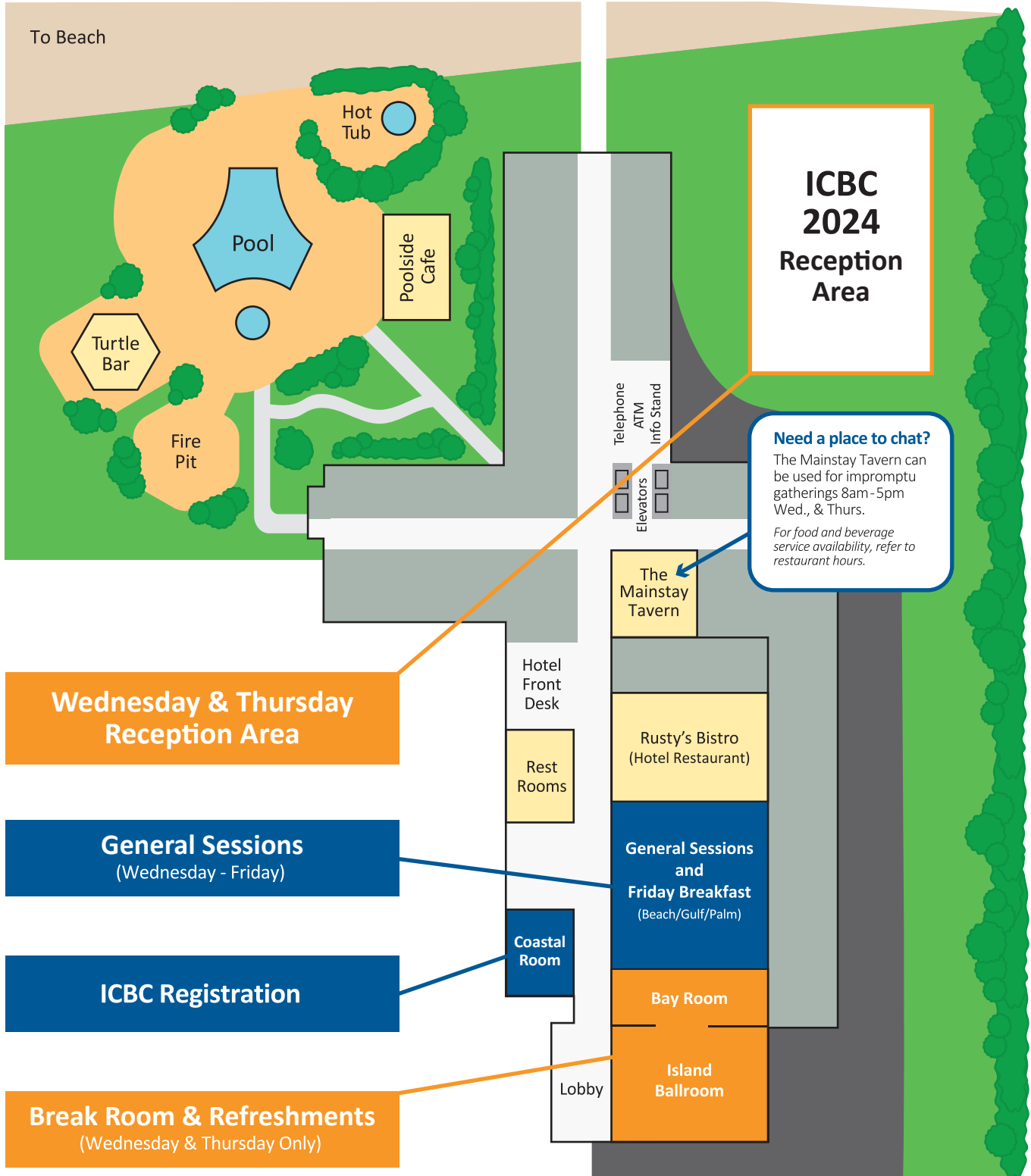
FS Human Nutrition
Food Science **IN**
University of Florida





Event Locations

at the Sheraton Sand Key Resort





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Name Badge

Attendees: Your name badge serves as your admission to all sessions and networking functions while attending ICBC 2024, so be sure to wear it throughout the conference.

Guests: Guests must wear their ICBC name badge to gain entry. Based on the fees paid during registration, the guest fee allows accompanying persons entrance to the Wednesday and Thursday Networking Receptions and/or the Friday Breakfast Buffet.



Wi-Fi Information

Wifi Network: MarriottBonvoy_Conference

Password: ICBC24

Welcome Letter

Welcome back to Clearwater Beach and the 2024 International Citrus and Beverage Conference! This year's conference will focus on key issues facing our industry spanning the topics of global juice and beverage operations to the marketing of new and emerging products and ingredients. Please join us for discussions on recent research and consumer insights regarding the beverage category (especially orange juice) and the impact of new regulations and technical innovations on the food, beverage, and value-added industries (including AI). The Friday morning "Hot Topics" session will again focus on research and new approaches to issues facing the citrus industry, including HLB research strategies, both short and long term.

We were happy to have a successful in-person event in 2023, and this year promises an equally rewarding event. Appreciation goes to everyone who has contributed to this year's conference. We would like to recognize our committee members, whose expertise within academia, industry and government led to the selection and invitation of our knowledgeable speakers. We would also like to give a special thank you to our invited speakers, who enthusiastically agreed to share their insights and knowledge. Lastly, we would like to express a very heartfelt thank you to our sponsors, whose generosity enhances the value, affordability, and uniqueness of this event each year.

We look forward to the next few days of talks and interaction, with opportunities to meet old friends and business contacts and the chance to make new ones. Once again, we hope you will find this conference a rewarding and valuable experience.

Renée Goodrich Schneider, Program Organizer

Professor & Chair

UF/IFAS Food Science & Human Nutrition

"Providing Solutions for the Citrus and Beverage Industries Since 1960"

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FS Human Nutrition
Food Science **HN**

Planning Committee

Clarissa Albarran, Brown International, LLC, Winter Haven, FL

Beto Amador, Evera by Citrosuco, Lakeland, FL

Jennifer Davis, dsm-firmenich, Lakeland, FL

Savy DiBenedetto, Savy Quality Review Inc., Daytona Beach, FL

Brandy Geiger, Florachem, Jacksonville, FL

Renée Goodrich Schneider, *Program Organizer*, UF/IFAS FSHN, Gainesville, FL

Stephen Heding, USDA, AMS, Winter Haven, FL

Michael Mas, JBT Corporation, Lakeland, FL

Anne Plotto, USDA, ARS, Ft. Pierce, FL

Keith Schneider, UF/IFAS FSHN, Gainesville, FL

Nick Shuman, The Coca-Cola Company, Apopka, FL

Linda Staten, USDA, AMS, Winter Haven, FL

Christopher Stone, ADM, Winter Haven, FL

Terica Turlington, Florida's Natural Growers, Lake Wales, FL

Yu Wang, UF/IFAS CREC, Lake Alfred, FL

Elizabeth Webb, *Program Chair*, Peace River Citrus, Arcadia, FL

Barry Wilson, Safe Chem, Inc., Zellwood, FL

Detailed Agenda

Tuesday, September 17, 2024 | Registration

4:00pm–7:00pm	Registration Open Registered attendees may pick up nametag and program [Coastal Room]
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Wednesday, September 18, 2024 | First Day of Sessions

7:30am–5:00pm	Registration Open [Coastal Room]
7:30am–8:25am	Light Morning Refreshments [Island Ballroom] Sponsored by: · Vincent Corporation
General Session [Beach/Gulf/Palm Rooms]	
Welcome and Introductory Remarks	
8:30am–8:45am	- Renée Goodrich Schneider UF/IFAS Food Science & Human Nutrition, <i>Program Organizer</i> - Elizabeth Webb Peace River Citrus, <i>Program Chair</i>
Session 1: The Global Citrus Industry	
Moderator: Beto Amador, <i>Evera by Citrosuco</i>	
8:45am	The Egyptian Citrus Industry - Khaled Abdel Rahim, <i>Agrumaria Reggina Egypt</i> (pg. 17)
9:20am	The Spanish Citrus Industry - Aldenizio Bezerra, <i>Fruit Tech Natural</i> (pg. 18)
9:55am	Coffee Break [Island Ballroom]
10:25am	Argentina Lemon Outlook - Sol Rotman, <i>S.A. Veracruz</i> (pg. 19)
11:00am	PANOPTIC - Global Citrus Trends - Richard Neish, <i>IFF</i> (pg. 20)
11:35am	Update on the Orange Crop in Mexico - Ricardo Martinez Zambrano, <i>Citrofrut</i> (pg. 21)
12:10pm	Lunch Break (on your own)

Wednesday, September 18, 2024 | First Day of Sessions (continued)

General Session [Beach/Gulf/Palm Rooms]

Session 2: Marketing & Citrus Industry Initiatives

Moderator: Brandy Geiger, *Florachem*

1:30pm	<p>Innovative Functional Beverages: Harnessing Citrus for Enhanced Health Benefits and Reduced Sugar Content - Camilo Parris, <i>dsm-firmenich</i> (pg. 22)</p>
2:05pm	<p>Citrus as a Tool for Bold Self-Expression - Jennifer Zhou, <i>ADM</i> (pg. 23)</p>
2:40pm	Coffee Break [Island Ballroom]
3:10pm	<p>Overview of FCPA Programs - Robin Bryant, <i>Magnolia Consulting Inc.</i> (pg. 24)</p>
3:45pm	<p>Overview of IFU Programs - David Hammond, <i>International Fruit and Vegetable Juice Assoc.</i> (pg. 25)</p>
4:20pm	<p>Florida Orange Juice Outlook - Marisa Zansler, <i>Florida Department of Citrus</i> (pg. 26)</p>
4:55pm	Announcements
5:00pm	Session Concludes
6:00pm–7:00pm	<p>Networking Reception [Outdoor Reception Area - <i>Weather Permitting</i>] Sponsored by:</p> <ul style="list-style-type: none"> • ADM • Advanced Logistics, LLC • Ampco Pumps Company • Brown International • Chemical Systems • Citrus Oleo • Cvista • dsm-firmenich • F.G.F. Trapani • Flavor Materials International • Florachem • Latin Lemon • Limones Piuranos SAC • Prodalim • Quicornac • S.A. Veracruz • Separator Technology Solutions • Trisun • Vicente Trapani S.A. • Ziemann Holvrieka GmbH

Thursday, September 19, 2024

7:30am–5:00pm	Registration Open [Coastal Room]
7:30am–8:25am	Light Morning Refreshments [Island Ballroom] Sponsored by: · Givaudan
General Session [Beach/Gulf/Palm Rooms]	
Session 3: Tools for Industry from AI to Staffing	
Moderator: Jennifer Davis, <i>dsm-firmenich</i>	
8:30am	Accelerating Innovation: How Generative AI is Revolutionizing Product Design - Dave Lundahl, <i>InsightsNow</i> (pg. 27)
9:05am	Data Intelligence to Accelerate Innovation in Research & Development - Kathy Timperman, <i>Tropicana Brands Group</i> - Marisa Kopec, <i>Lux Research</i> (pg. 28)
9:40am	Coffee Break [Island Ballroom]
10:15am	Leading a Sustainable Value Chain - Orlando Nastro Neto, <i>Citrosuco</i> (pg. 29)
10:50am	Recruiting Talent from Within the Company - David Barber, <i>Florida's Natural Growers, Inc.</i> (pg. 30)
11:25am	Utilizing High-Throughput Phenotyping to Screen Germplasm for Promising Citrus Accessions in HLB-Endemic Florida - John Chater, <i>UF/IFAS CREC</i> (pg. 31)
12:00pm	Lunch Break (on your own)

Notes

Thursday, September 19, 2024 (continued)

Session 4: Processing Technologies & Strategies

Moderator: Linda Staten, *USDA, AMS*

1:30pm	High Pressure Processing of Juice - Austin Lowder, <i>JBT Corporation</i> (pg.32)
2:05pm	Wide Gap Heat Exchanger Technology - Kevin Kennedy, <i>Alfa Laval</i> (pg. 33)
2:40pm	Coffee Break [Island Ballroom]
3:10pm	De-sugared™ Fruit Juice - Making Zero Sugar Nutritious & Beneficial - Stephen Horgan, <i>InterContinental Beverage Capital</i> - Dino Cardelli, <i>InterContinental Beverage Capital</i> (pg. 34)
3:45pm	The Challenges, Perceptions, and Benefits of Cannabis in Beverages - Louis Heinsz, <i>Bevnology LLC</i> (pg. 35)
4:20pm	Consumer Insights on Sweetener Types and Energy Drinks - Lisa House, <i>UF/IFAS FRE</i> (pg. 36)
4:55pm	Announcements
5:00pm	Session Concludes
5:30pm–7:00pm	Networking Reception [Outdoor Reception Area - <i>Weather Permitting</i>] Sponsored by: <ul style="list-style-type: none">• ALLIMPO - Lemon from Spain®• Bucher-Alimentech Limited• Citromax Group• Citrotec International Inc.• Evera by Citrosuco• Givaudan• International Flavors & Fragrances Inc. (IFF)• JBT Corporation

Notes

Friday, September 20, 2024

7:30am–10:00am	Registration Open [Coastal Room]
7:45am–8:30am	<p>Morning Breakfast [Grand Ballroom]</p> <p>Sponsored by:</p> <ul style="list-style-type: none"> • The Coca-Cola Company • Safe Chem Inc. • Winniczuck Family
General Session [Beach/Gulf/Palm Rooms]	
Session 5: Hot Topics in the Industry	
Moderator: Anne Plotto, <i>USDA, ARS</i>	
8:35am	<p>History of the Florida Citrus Flavor Industry</p> <p>- Robert Kryger, <i>Florida Polytechnic University</i> <i>(pg. 36)</i></p>
9:10am	<p>Industrial Solutions for Citrus Debitting</p> <p>- Nick Shea, <i>Bucher-Alimentech Limited</i> <i>(pg. 38)</i></p>
9:45am	<p>The Search for HLB Tolerant Sweet Orange and Mandarin Hybrids</p> <p>- Weston Johnson, <i>The Coca-Cola Company</i> <i>(pg. 39)</i></p>
10:20am	<p>Grove-First - A New Framework to Find Solutions to HLB that are Safe, Affordable, and Available</p> <p>- Michelle Heck, <i>USDA, ARS</i> - Randy Niedz, <i>USDA, ARS</i> <i>(pg. 40)</i></p>
10:55am	<p>Orange Peel Extracts and Heart Health</p> <p>- Yu Wang, <i>UF/IFAS CREC</i> <i>(pg. 41)</i></p>
11:30am	Conference Concludes

Notes



Speaker Abstracts

Listed in order of presentation.

Presenting author names appear in **bold**.

We sincerely thank all speakers for agreeing to share their expertise and work. Our speakers have graciously prepared abstracts and we hope these will be useful to you as a possible source of industry practices. While informative, opinions and recommendations expressed in this publication are those of the authors and do not necessarily reflect the views of UF/IFAS.

The Egyptian Citrus Industry

Khaled Abdel Rahim

Delta Aromatic, Agrumaria Reggina

Egypt has been rapidly increasing its citrus processing capacity, positioning itself as a potentially significant player in the citrus market. This talk will explore the factors contributing to this growth, including the country's ideal climate and strategic proximity to Europe. By analyzing historical trends and patterns, we will examine the opportunities and challenges that lie ahead for Egypt's citrus industry. Attendees will gain valuable insights into the dynamics of this emerging market, with a particular focus on how economic cycles and fruit availability are interlinked, shaping the industry's future prospects.

Contact Information

Khaled Abdel Rahim, Managing Director, Egypt, Agrumaria Reggina, Egypt, Phone: 201001613015, Email: k.abdelrahim@deltaaromatic.com

The Spanish Citrus Industry

Aldenizio Bezerra

Fruit Tech Natural

This talk is an overview of the past 10 years of the citrus fruit production and processing in Spain, Spanish fresh fruit and processing environment, and challenges and opportunities faced by the industry, pre- and post-pandemic.

It will conclude a comparison between the citrus industry in Brazil and Spain, from farming to varieties, processing and diseases as well as the sustainability aspects.

Contact Information

Aldenizio Bezerra, Fruit Tech Sales Director, Fruit and Tech Natural, Spain, Phone: 34676334292,
Email: abezerra@fruitandtech.com

Argentina Lemon Outlook

Maria Del Sol Rotman

S.A. Veracruz

Argentina is a global leader in lemon production, with Tucumán at the forefront, accounting for over 60% of the world's lemon processing. This presentation will explore Argentina's extensive lemon processing capabilities, emphasizing Tucumán's advanced infrastructure and technologies. We will examine how Tucumán's processing strengths bolster Argentina's leadership in the global market. Additionally, the presentation will provide an overview of the broader citrus industry in Argentina, including current industry conditions, and address the challenges and future prospects for the sector.

Contact Information

Maria Del Sol Rotman, Commercial Director for Industrial Products, S.A. Veracruz, Ruta 301 Km 12.7, San Isidro de Lules (4128) Tucuman, Argentina, Phone: 54 381 4812533/77/3031, Email: sol.rotman@saveracruz.com.ar

PANOPTIC - Global Citrus Trends

Richard Neish

IFF

Navigating the complex landscape of trends to drive innovation is a significant challenge for organizations. At IFF, we have developed a proprietary approach to trends and foresights, called Panoptic, that enables us to effectively manage this complexity. This presentation will provide an overview of our approach, focusing on three levels and time horizons that cover short-, mid- and long-term trends. We will discuss the core elements of each level, their applications within an organization, and provide concrete examples to illustrate their impact.

Our structured approach underpins long-term innovation in the citrus space through our Re-Master Citrus program. We will delve into how Panoptic has been crucial in shaping the roadmap for citrus at IFF, highlighting some of the technologies and expertise that have emerged from the program. Additionally, we will outline the program's future direction and the benefits it offers to the industry. A key highlight being the introduction of our state-of-the-art Citrus Innovation Centre, set to open in early 2025.

Finally, we will explore how our Panoptic tool, Trendsformed, can inspire new citrus creations in both flavor and fragrance, driving forward our innovation agenda.

Contact Information

Richard Neish, Global Futures, IFF, Netherlands, Email: Richard.neish@iff.com

Update on the Orange Crop in Mexico

Ricardo Martinez Zambrano

Citrofrut

Mexico plays an important role in the world's citrus industry, both as a producer and processor of a wide range of citrus fruits. Climate change and diseases have had an important impact on citrus production. Our conversation will focus on the current Mexico's Orange crop situation. I hope to provide a clear picture of where we are coming from, where we are today, and what you can expect from Mexico's Orange crop in the future.

Contact Information

Ricardo Martinez Zambrano, Citrofrut, Benito Juarez 1102, Piso 44, Monterrey, Nuevo Leon, 64000, México, Phone: 52.81.8389.4200, Email: ricardo.martinez@citrofrut.com

Innovative Functional Beverages: Harnessing Citrus for Enhanced Health Benefits and Reduced Sugar Content

Camilo Parris

dsm-firmenich

Historically, the citrus industry has endured perennial success in beverage applications. However, recent market dynamics—including but not limited to inflationary pressures, raw material sourcing, and evolving consumer sentiments—have casted some uncertainty on the future contribution of citrus within today’s market. This presentation provides a fresh lens perspective on how citrus can continue to play a vital role in generating strong sales growth, with the support of added health benefits that appeal to today’s consumer demand. Through leveraging pre-existing halo benefits inherent to citrus-based beverages, the combined effort of unique fortification while addressing sugar concerns can help generate revenue lift and opportunities to differentiate. This presentation intends to showcase the value of combining consumer insights with science-backed health claims to fast-track meaningful product development.

Contact Information

Camilo Parris, Health Benefits and Solutions Manager, dsm-firmenich, 3502 North Olive Road, South Bend, IN 46628, USA, Phone: 574-237-6974, Email: Camilo.parris@dsm-firmenich.com

Citrus as a Tool for Bold Self-Expression

Jennifer Zhou

ADM, Inc.

What are the trends in the global marketplace today? How does citrus around the world bring these trends to life? During this session, Jennifer will share the trends in 2024 and how citrus plays an important role in all types of market products to signal, refresh and delight consumers.

Contact Information

Jennifer Zhou, Global Senior Director, Citrus & Flavors Marketing, ADM, Inc. USA, Phone: 609-819-6574,
Email: Jennifer.shou@adm.com

Overview of FCPA Programs

Robin Bryant

Magnolia Consulting Inc.
Florida Citrus Processors Association

The Food and Drug Administration (FDA) created the Pasteurized Orange Juice standard of identity in 1963 which helped ensure consumers that orange juice is a high quality and minimally processed juice. Over time, certain standards have become outdated and need to be revised to reflect current industry values.

Over the past decade, one of the largest impacts on the Florida citrus industry has been HLB and the accompanying reduction in the average Brix of orange juice. The FDA standard establishes a minimum Brix level that was based on industry averages when the standard was created. Recent years have shown average Brix levels for the Florida orange crop below this minimum. Mitigation efforts to blend with juice from other citrus producing regions and with juice from *Citrus reticulata* have worked in the past, but are not a permanent solution

The FDA standard also defines that orange juice be comprised of “sweet orange” or *Citrus sinensis*. It has been established through molecular and genomic work that *Citrus sinensis* is not a true species, but a hybrid. Additionally, solutions to HLB may come through citrus hybrids with parentage from *Citrus reticulata* or other citrus species.

The Florida Citrus Processors Association has requested that the FDA modernize the Standards of Identity for Orange Juice by decreasing the minimum Brix standard, by increasing the allowed percentage of *Citrus reticulata*, and by changing the definition of sweet orange. The reasoning behind the need for these changes will be discussed, along with the current progress with the FDA.

Contact Information

Robin Bryant, President, Magnolia Consulting Inc. and Executive Director, Florida Citrus Processors Association, Phone: 941-803-0136, Email: robin@magnoliaag.com

Overview of IFU Programs

David Hammond

International Fruit and Vegetable Juice Association

The international standard for fruit juices and nectars (codex STN 247) was adopted in 2005 and now is ready for an update, which the IFU legislation commission has been working on. Once completed, IFU will investigate obtaining a Codex member country's support to front this topic at the Codex executive committee to seek approval for this new work.

Due to the changes brought about by taxonomist it has provided an opportunity to look at the types of fruits that can be used to produce orange juice. As *Citrus sinensis* is no longer considered a "true species", there may be other orange like hybrids that liberates a liquid similar to orange juice and it is possible that some of these hybrids may also offer resistance to citrus greening. To this end IFU has been working with experts towards drawing up criteria that could be used to prepare a cultivar register of what hybrids could be used to prepare orange juice.

During the course of my presentation the progress that has been made on the topic will be discussed along with other proposed changes that could be made to the revised standard.

Contact Information

David Hammond, IFU Legislation Chair, International Fruit and Vegetable Juice Association, United Kingdom, Phone: 447989650953, Email: davidfruitjuice@aol.com

Florida Orange Juice Outlook

Marisa Zansler

Florida Department of Citrus

The Florida orange juice outlook in the 2024-25 season will be marked by challenges on both the supply and demand sides. Over the past decade, the global citrus industry has faced a severe decline in orange juice production due to factors such as HLB and adverse weather events. Despite these obstacles, Florida remains a critical player in the U.S. orange juice market, supplying a substantial portion of the nation's processed orange juice and leveraging its robust infrastructure to maintain the category's competitive edge within the beverage category. As the industry grapples with reduced production, maintaining and enhancing consumer demand has become vital to sustaining higher prices and ensuring market stability until production levels recover. This presentation will provide a comprehensive outlook on the Florida orange juice market, drawing on the most recent data and analysis.

The talk will be structured in three key parts: (1) an analysis of trends in Florida processor utilization of oranges, imports and domestic receipts, orange juice movement, and inventories; (2) a view of how global production impacts U.S. consumption; and (3) an overview of U.S. orange juice demand and current retail sales trends.

Contact Information

Maria L. Zansler, Ph.D., Director, Economic and Market Research, Florida Department of Citrus, Bartow, Florida, USA, Phone: 352-294-7691, Email: mzansler@citrus.myflorida.com

Accelerating Innovation: How Generative AI is Revolutionizing Product Design

Dave Lundahl

InsightsNow

Innovation teams in the food and beverage industry are challenged to be inspired to bring to market new products that fulfill unmet needs with limited time, money, and human resources. Generative AI promises to be a revolutionary way that overcomes these challenges by increasing the creative capacity of innovation team.

Only a fraction of the new products created achieve market success. Behavioral science tells us that successful new products tend to be **FAMILIAR** with a **TWIST**. Our approach directs generative AI through insights from consumer research to create **TWISTS** on top of what consumers find familiar which fulfill the discovered gaps, tensions and unmet needs among consumer experiences. Our process uses a five-step prompting sequence to direct AI to generate a wide range of different product concepts that fulfill these gaps through innovative twists using a framework called SCAMPER.

This talk will show how we do it through a case study. Further, we will show how you can bring the human back into the AI lead co-creation process – whether it is product developers, marketers and/or consumers as co-creators to screen, modify and select using human intelligence. Finally, this talk will show how you can co-create to yield more bold concepts by generating twists on twists to focus your innovations further out in time or to have greater disruptive impact.

The results from this approach are proving powerful, ushering in a new era where creative capacity can be dramatically increased to inspire a wide range of innovation teams while overcoming their resource challenges through the power of AI.

Contact Information

Dave Lundahl, Founder and CEO, InsightsNow, USA, Phone: 541-224-0972, Email: dave.lundahl@insightsnow.com

Data Intelligence to Accelerate Innovation in Research and Development

Kathy Timperman

Tropicana Brands Group

Marisa Kopec

Lux Research

The Tropicana Brands Group (TBG) has embarked on a transformative journey to redefine how R&D approaches data. This presentation will explore TBG's strategic efforts to modernize its data handling and leverage new tools to accelerate innovation. We will discuss the opportunities presented by the carve-out from PepsiCo, allowing TBG to reset its R&D data strategy and highlighting the integration of cutting-edge data tools into R&D processes. Through a case study with Lux Research, we will highlight how we are leveraging strategic partnerships to embed AI capabilities and drive innovation.

Contact Information

Kathy Timperman, Global R&D Lead, Open Innovation and R&D Ecosystem, Tropicana Brands Group, Phone: 847-382-1003, Email: Kathleen.timperman@tropicana.com

Marisa Kopec, CEO, Lux Research, Boston, MA, USA, Phone: 617-502-5300

Leading a Sustainable Value Chain

Orlando Nastri Neto

Citrosuco

In this agenda, the head of ESG at Citrosuco/Evera, Orlando Nastri, brings the perspective of the international challenges of climate change and traceability in the global production chain and the offer of sustainable solutions by Evera. Topics such as Circular Economy, Energy Transition, Climate Emergency, Social and Environmental Certifications, among others that are immersed in Evera's core business of oils, essences and nutritional products will be covered in the presentation.

Contact Information

Orlando Nastri Neto, ESG Head, Citrosuco, Brazil, Phone: 5511936189574, Email: Orlando.neto@citrosuco.com

Recruiting Talent from Within the Company

David Barber

Florida's Natural Growers, Inc.

If you are having trouble sourcing talent, especially for leadership roles, join the club. It is difficult and risky to base hiring decisions on a resume and a few panel interviews. For some organizations this leads to a drawn-out hiring process, delayed decision making, and “buyer’s remorse”. What if the best job interview was a job? If you have used “temp-to-perm” or “contract-to-FTE” programs you might have learned that the best way to know if someone is a fit for the organization and for a role is to see them perform. The same benefits apply when recruiting from within. But it takes more than just posting jobs and hoping internal candidates apply. It requires in-depth knowledge of the talent in your organization, understanding of the critical competencies for success in a role, and deliberate development of candidates to prepare them for future roles. In this discussion we will discuss the use of Talent Review, Succession & Mobility, and Development Plans as tools for recruiting from within.

Contact Information

David Barber, Director of Talent and Organizational Development, Florida's Natural Growers, Inc.
Phone: 863-676-1411, Email: David.barber@floridasnatural.com

Utilizing High-Throughput Phenotyping to Screen Germplasm for Promising Citrus Accessions in HLB-Endemic Florida

John M. Chater

University of Florida Institute of Food and Agricultural Sciences

Huanglongbing (HLB) has been decimating citrus production in Florida for almost 20 years. Despite scientists' best efforts, there is still no end in sight to the calamity of HLB. The UF/IFAS breeding program possesses advanced breeding selections that appear tolerant to the disease. Drones were used to screen germplasm over two years to identify the healthiest citrus accessions for conservation, breeding, scientific research, and selection for Stage II trials. A total of 4,971 different combinations comprised of 6,963 unique scions and 1,211 unique rootstocks were evaluated with multispectral and red, green, and blue (RGB) imaging. Cutoffs were set for normalized difference vegetation index (NDVI) and tree size to focus on mature, fruit bearing plant material. Two sites underwent oxytetracycline treatments between year 1 and year 2 and drone metrics indicated some interesting results. Some fruit quality data from the oxytetracycline treatments will be discussed. The purpose of this project was 1) to determine if there are selections in current evaluation trials or plantings that stand out as selections that could be sufficiently HLB tolerant to allow the citrus industry to achieve profitability; 2) to identify gaps and redundancies in breeding selections and populations to assist plant breeders in deciding future crosses; and 3) to create data that can be used by researchers to help determine future crosses of breeding parents. Several accessions were selected as top performers for evaluation, conservation and trialing, including 'OLL' sweet orange bud lines, 'N13-32 Hamlin', several orange-like hybrids, and many others. More research is needed to determine profitability and juice quality of these advanced selections.

Contact Information

John M. Chater, Assistant Professor, Citrus Genetic Improvement Horticulturalist, Citrus Research and Education Center, University of Florida/IFAS Department of Horticultural Sciences, 700 Experiment Station Road, Lake Alfred, FL 33850, USA, Phone: 863-956-8662, Email: jchater@ufl.edu

High Pressure Processing of Juice

Austin Lowder

JBT Corporation

High pressure processing (HPP) is a non-thermal, non-chemical, processing technology that has been utilized by the juice industry to extend the shelf life and improve the safety of juice products with minimal impact on sensory and nutritional quality. HPP uses water pressure up to 87,000 psi (6,000 bar) to reduce or eliminate many unwanted microbiological contaminants in juice products, such as bacteria, yeasts, molds, viruses, and protozoa. In this session we will discuss the use of HPP in the juice industry and its effectiveness against a variety of microorganisms, with special focus on parasitic protozoa.

Contact Information

Austin Lowder, Food Science Manager, JBT Corporation, Avure Technologies, Phone: 513-435-8105, Email: austin.lowder@jbtc.com

Wide Gap Heat Exchanger Technology

Kevin Kennedy

Alfa Laval

Alfa Laval's latest product offering features OpenChannel™ technology that allows the product to flow freely without obstacles, avoiding particles and fibres plugging inside the channels. This allows for longer operating time and extended cleaning intervals while maintaining the efficiencies of plate heat exchangers. From products such as fruit purees and juices to sauces and plant-based beverages, the new HL8-WG can efficiently heat, cool and even utilize product to product regeneration with less hold up volume and a smaller floor footprint than other product offerings. Let's discuss this new offering and dive in to see what it could do for your operations.

Contact Information

Kevin Kennedy, Application Engineer III, Food Heat Transfer, Food and Water Division, Alfa Laval,
Phone: 804-545-8382, Email: Kevin.Kennedy1@AlfaLaval.com

De-sugared™ Fruit Juice - Making Zero Sugar Nutritious & Beneficial

Stephen Horgan and Dino Cardelli

InterContinental Beverage Capital

Sugar Reduction- As the global food and beverage market is projected to surge to \$11.4 trillion by 2028, the widespread presence of sugar—both natural and added—continues to dominate over half of the supply chain. Since the mid-20th century, the detrimental effects of sugar consumption have been increasingly scrutinized, with a growing body of scientific evidence linking it to rising obesity rates, diabetes, and overall declines in health and life expectancy. As consumers become more educated and health-conscious, there is a mounting demand for reduced-sugar options. This has pushed brands to innovate and reformulate their products.

InterContinental Beverage Capital (IBC) has been a key player in the sugar reduction movement, championing efforts to minimize sugar in food and beverages. The most evident example of this commitment is its partnership with New Tree Fruit Company, an innovation leader in sugar reduction technology. Based in Michigan, New Tree has developed a groundbreaking, globally patented de-sugaring™ process. This technology effectively removes all sugar from fruit while retaining its full nutritional value, transforming it into juices, concentrates, purees, and powders that can be used as ingredients across a wide array of food and beverage products. Through its collaboration with New Tree, IBC is working on various products that leverage the unique nutritional benefits of these de-sugared fruit concentrates. These innovative ingredients allow brands to create food and beverages with all the positive attributes of fruit—such as antioxidants, phytonutrients, flavor, and fiber—without the sugar, carbs, or calories. By removing sugar, companies can concentrate on amplifying the other beneficial properties of juice, enabling food and beverage designers to meet the evolving demands of health-conscious consumers. No longer do consumers have to settle on diluted less nutritious options in their diets.

These de-sugared™ juice concentrates open up new possibilities for product development, whether it's crafting 100% juice beverages, drinks with specific fruit portions, or functional beverages packed with targeted nutrients. Additionally, they can be used as a base for fiber-rich formulations that help sequester oil, fat, or even cannabis and ketones. The result is a new frontier in juice innovation and nutrition that's even better than the original, unlocking new opportunities for healthier, more functional foods and beverages.

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The Challenges, Perceptions and, Benefits of Cannabis in Beverages

Louis Heinsz

Bevnology LLC

The cannabis beverage market—encompassing THC, CBD, and their various derivatives—has made significant strides over the past eight years. In the early stages, a primary challenge was preventing cannabis compounds from being absorbed by packaging materials, such as can liners, glass bottles, or the hydrocarbon structure of plastic bottles. These issues not only affected the perceived value of the product for consumers but also created regulatory complications, as sample reviews often revealed lower-than-claimed cannabis content, leading to compliance issues with state regulations.

As technology has advanced, these packaging concerns have been largely addressed, allowing for more consistent and reliable cannabis dosages. With these hurdles overcome, consumer expectations have naturally evolved. Today's buyers are seeking better-tasting, less processed cannabis beverages that prioritize natural ingredients and clean-label solutions. Developers are now focusing on reducing bitterness, minimizing the taste impact of surfactants and emulsifiers, and finding more natural ways to enhance absorption, even at low THC or CBD doses.

Much like the early natural foods movement, the cannabis beverage industry is experiencing a shift. Early adopters were more willing to accept trade-offs in taste and texture, but as cannabis drinks inch closer to the mainstream, new consumers are demanding higher-quality products with refined flavors and better overall experiences. As the regulatory landscape continues to become more streamlined and clear, the cannabis beverage market is poised for substantial growth. Soon, cannabis beverages could become a thriving industry, standing proudly alongside alcohol, functional drinks, and medical foods, carving out its niche in the marketplace.

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Consumer Insights on Sweetener Types and Energy Drinks

Lisa House

University of Florida Institute of Food and Agricultural Sciences

Consumer preferences play a significant role in shaping the dynamics of the food and beverage industry. Sweeteners, due to their diverse sources and types, are a critical aspect of consumer decision-making. This presentation will share results from a study that examined consumer preferences and knowledge about different types of sweeteners (including unsweetened, sugar, artificial and natural sweeteners). In addition to including sweeteners currently in the market (Sucralose, Stevia, and Monk Fruit), respondents were asked for their opinions about a potential sweetener derived from mangoes, to understand the potential market for new natural sweeteners.

The presentation will also cover results from a choice experiment conducted where energy drink consumers were faced with different choices among energy drinks containing different sweeteners, different caffeine levels, and different prices. The results of the choice experiment provide further information about how perceptions of sweeteners impact choices, as well as providing some insights into the growing energy drink sector.

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History of the Florida Citrus Flavor Industry

Robert Kryger

Florida Polytechnic University

I recently completed a historical study of the development of the very successful citrus flavor industry in Florida, leveraging my technical expertise, family history, and access to industry leaders, in addition to a broad range of public and private records. The result is an upcoming article in the Florida Historical Quarterly and a full-length book. In this presentation, I will share some anecdotes describing how the industry developed, the important relationship with the discovery of FCOJ, and identify some of the key people and circumstances responsible for its success.

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Industrial Solutions for Citrus Debittering

Nick Shea

Bucher-Alimentech Ltd.

Bucher Unipektin AG.

Juice producers face constant new challenges, including environmental events and the need to maximize resource value. Among these challenges are juice bitterness and off-flavours caused by issues such as citrus greening, varietal availability, and adverse weather conditions.

For over three decades, Bucher-Alimentech has been providing turnkey process solutions to address these problems. Their innovations have proven to be game changers for many juice companies worldwide. With over 70 machines now deployed across six continents, Alimentech's adsorption technology has been continually refined and optimized. However, the company remains committed to seeking further improvements, new adaptations, and applications.

Thanks to these advancements, customers can now juice fruit that would otherwise be too bitter or acidic. Industrial juice producers can also process by-products and extracts, enhancing yield, quality, and profitability.

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The Search for HLB Tolerant Sweet Orange and Mandarin Hybrids

Weston Johnson

The Coca-Cola Company

The first citrus breeding crosses in Florida occurred in 1893. Since that time, citrus breeders from The U.S. Department of Agriculture (USDA) and The University of Florida (UF) have produced tens of thousands of new citrus accessions. Only a small portion of these have been thoroughly evaluated. In this study, we evaluated 250 (63 Sweet Orange & 187 mandarin & mandarin hybrid) citrus accessions from USDA & UF collections for tree health, fruit quality, and not from concentrate (NFC) juice potential. All fruit samples were collected from Florida trees exposed to Huanglongbing (HLB)—indeed nearly all trees and fruit exhibited at least some HLB symptoms. Fifty of the highest performers will be planted in early 2025 as part of a Citrus Research & Development Foundation (CRDF) sponsored stage 2 trial. Three of the top performers are scheduled to be released and available to growers sometime in 2025.

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Grove-First - A New Framework to Find Solutions to HLB that are Safe, Affordable, and Available

Michelle Heck and Randy Niedz

USDA, Agricultural Research Service

Leveraging the precise delivery benefit of trunk injection, USDA ARS scientists developed the 'Grove-First' framework to rapidly identify effective HLB treatments in the field. Grove-First uses design of experiments principles to efficiently evaluate numerous treatments and swiftly move them to commercial usage. To accelerate industry adoption, a drug repurposing approach is used that selects molecules that are commercially available and have documented regulatory-friendly chemistries. Grove-First bypasses costly lab tests by applying treatments directly to trees in citrus groves, and measures only the effects necessary to solve HLB - tree health, fruit yield and juice quality. In its inaugural year, Grove-First identified ~20 treatment chemistries with effects comparable to or better than oxytetracycline on visual tree-heal and yield indices in HLB-positive 9-year-old Valencia trees. Our presentation will summarize the defining features of the new framework and provide information on the top molecules from the first screening trial. Partnership among researchers, growers, state and federal entities, grower organizations and regulatory consultants will help ensure that citrus growers have access to a subset of these molecules this year.

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Orange Peel Extracts and Heart Health

Yu Wang

University of Florida Institute of Food and Agricultural Sciences

In Florida, most sweet oranges are used for juice production, leaving the peel as a byproduct, often discarded or used as cattle feed. Our research aims to turn this waste into a valuable resource by using orange peel to prevent heart disease, benefiting both human health and the citrus industry. In our study, we explored how different parts of the orange peel can impact heart health. We found that the polar fraction of the peel (OPP) is particularly effective in reducing harmful compounds linked to heart disease, such as TMA and TMAO, which are produced during digestion. Interestingly, these effects occur without changing the composition of gut bacteria. Instead, the peel works by affecting specific enzymes involved in these harmful processes. One compound, feruloylputrescine, found in higher amounts in OPP, shows the strongest ability to reduce these risks. This discovery suggests that orange peel, especially the OPP, could be a natural way to support heart health and add value to the citrus industry.

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Morning Breakfast

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Thank You to Our 2024 Sponsors

