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Bright bites:

Transforming food
with natural color,
bold tastes



STARTING POINTS



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While chefs wield time and intuition to craft bold, complex flavors, manufacturers must replicate that artistry on a massive scale using machinery and precision.

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The MAHA regulatory shift is creating a **golden age** for clean-label innovators

It's our time to shine!

The regulatory landscape is undergoing a transformative shift, creating unprecedented opportunities for the better-for-you food and beverage sector. As Secretary of Health and Human Services (HHS) Robert F. Kennedy Jr. advances the Make America Healthy Again (MAHA) initiative, we're witnessing a pivotal moment where clean-label formulation expertise has become the industry's most valuable currency.

This regulatory evolution signals more than just compliance challenges. It represents a strategic inflection point where companies with established natural formulation capabilities can capture significant market share. The impending restrictions on artificial additives aren't merely regulatory hurdles; they're catalysts accelerating the industry toward innovation pathways many of us have championed for years.

This is indeed our sector's defining moment to demonstrate leadership in creating products that align with both consumer preferences and emerging regulatory frameworks. At the recent IFT First Chicago conference, regulatory issues were top of mind, particularly natural colors and flavors.

During my one-on-one conversations with companies like Oterra – one of the industry's largest global providers of naturally sourced colors – I found experts to be candid and enthusiastic about sharing their findings.

"Consumers consistently associate positive attributes with natural colors," Vibeke Haislund, head of global marketing at Oterra, said. "When we explain that natural colors are derived from sources like beets, consumers make that positive connection, while artificial colors trigger negative associations, which isn't surprising."

"For many color applications, achieving comparable results with natural alternatives isn't problematic, but some applications present challenges," Haislund explained. "In these cases, brands need to effectively communicate that using ingredients with natural origins doesn't compromise product quality – it enhances it."

We'll continue exploring the topics of natural colors and flavors – and some of the adjacent nuances – in this digital magazine and at SupplySide Global in October.

Be well. Eat well.



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Synthetic dye bans reshape recipes and supply chains

by Grant Gerke

Food manufacturers are responding to state and federal bans on Red No. 3 and other synthetic dyes. The industry now faces a new phase of challenges in specifying, formulating, processing and building out supply chains for natural and possibly fermentation-derived colorants.

Red No. 3 total sales fell by 5% in 2024 to \$4.2 billion, according to [NielsenIQ](#). A synthetic pigment, Red 3 has been a staple for food formulators, even showing growth among private label products in 2024, up 0.85%.

In January 2025, however, the U.S. Food and Drug Administration (FDA) banned red dye for food formulations, a mandate that goes into effect Jan. 15, 2027. Color replacement is a voluntary action until then. On the state level, though, a new California law now bans synthetic dye materials – Blue 1, Blue 2, Green 3, Red 40, Yellow 5 and Yellow 6 – and New York has proposed a bill that would ban those color additives as well as titanium dioxide.

Sherry Frey, VP of total wellness at Nielsen IQ, said, “As consumers pay more attention than ever to ingredients, the reality of specific ingredients being challenged by activist consumers as well as science is likely to occur more often.”

The daunting challenge facing food manufacturers is finding natural pigment



substitutes made from plants, fruits, insects – female cochineal bugs – and possibly precision fermentation. While synthetic colorants have been market-tested and often are able to avoid discoloration or fading during processing, some suppliers of newer natural colorants are evaluating how their substitutes perform in food production. Plus, a shift to natural colorants adds a new level of demand for this supply chain.

Currently, popular natural color replacements include betacyanin, a red/violet pigment found in red beets, and anthocyanins, which are also used as natural pigments in various industries, due to the color palette they can produce, from red to blue to purple.

The challenges are numerous with natural colorants during processing compared to synthetic dyes.

Finding a one-to-one replacement for synthetic dyes is a challenge, due to factors such as pH, light and heat during food processing.

Alice Lee, technical marketing manager at plant-based food coloring provider GNT USA, explained, “With plant-based colors, success comes down to how the pigment behaves in your specific matrix, which can include everything from pH and water activity to the presence of fats, emulsifiers, vitamins and how the product is processed – temperature, mixing and order of addition can all matter depending on the application.”

In addition, food manufacturers are testing natural colorants at multiple processing plants, looking for any differences between production environments. A new formulation with natural colorants can react much differently at a plant in central California, with less humidity, than at a plant in South Carolina.

“We’ve developed stabilization systems that allow spirulina (*Arthrospira platensis*) – a type of cyanobacteria – to survive commercial processing conditions for shelf-stable acidic beverages, including thermal treatment and low pH, while maintaining color stability throughout a typical 12-month shelf life,” Lee added.

The challenges are numerous with natural colorants during processing compared to synthetic dyes. Emina Goodman, senior commercial director of color development at multinational food processor ADM, described, “Poorly dispersed pigments can lead to separation, sedimentation, staining and other issues that can cause an uneven shade appearance in foods and beverages.”

Effective immediately, no new synthetic dyes

In June, global food and beverage corporation The Kraft Heinz Co. announced it would not launch any new products in the U.S. with synthetic colors, effective immediately, and would remove dye-based colors from its U.S. product portfolio before the end of 2027. Food giant General Mills has made similar comments.

Sensient Technologies Corp., a global manufacturer of colors, flavors and oils, recognized the need for supply chain growth. The supplier has started to diversify crop location with farmers to take advantage of different growing seasons to meet new demand.



Market developments



The daunting challenge facing food manufacturers is finding natural pigment substitutes made from **plants, fruits, insects – female cochineal bugs – and possibly precision fermentation.**

Paul Manning, Sensient's CEO, shared more details with the Wall Street Journal in July, "For example, red radish is usually planted in late summer to be grown in the fall; and by growing it in the United States and Peru, which have different fall months, we can harvest red radish twice a year instead of once."

That progress aside, he added, "It takes time to diversify, do it and grow it safely following the law and sustainable agricultural practices."

With no defined FDA standards for natural colors, Sensient developed its own benchmarks for these additives. The company cited in the Journal interview that approximately 1 out of every 4 raw materials it tests fails to meet the company's safety standards.

With new supply chain options needed, food manufacturers are investing in biomanufacturing and precision fermentation

technologies as a potential alternative to synthetic and natural colorants. Döhler Ventures, part of global ingredient provider Döhler Group, partnered with Danish-based Chromologics, a precision fermentation company, in 2023.

The partnership focuses on scaling "Natu.Red," a bio-based colorant alternative. In 2023, Chromologics received more than \$13.7 million in investments, and in 2024, it partnered with Olon Group, a food biomanufacturing company, to scale up manufacturing.

Karsten Dinesen, COO of Chromologics, said, "It has been essential for Chromologics to find a contract development and manufacturing organization (CDMO) capable of ensuring the quality of our final product and rapidly scaling our production capacity to meet the global demand for natural colors." ■



[Grant Gerke](#) is a seasoned industry 4.0 (digital transformation) editor reporting on manufacturing developments in the food and beverage industry. His career includes stops at Automation World magazine as a digital managing editor and freelance writer for Food Engineering and ProFood World magazines.



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The Game Changers

Here's a spotlight on 10 top brands leading the industry with successful concepts, mindful execution.



Goodles

Force of Nature



Happy Candy



Pitaya Foods



Teton Waters Ranch



Brooklyn Delhi



Lexington Bakes

Dave's Killer Bread



Little Bellies



Rivalz



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10 brands
redefining
**technical
boundaries** in
natural colors
and flavors



These molecular architects are crafting nutrient-packed, visually stunning products that defy the limits of processing and shelf life.

by Heather Carter

Consumers eat with their eyes first and demand clean labels second. As such, food scientists face a formidable challenge: Create visually stunning, flavorfully complex products using natural ingredients that withstand industrial processing and extended shelf life.

“Brands are using color as a storytelling tool,” Dana Osborn, marketing manager at California Natural Color, explained. “There’s a growing interest in sensory experiences, functional beverages and natural hues that are linked to wellness, like calming blues and purples and earthy greens. Cross category, brands are increasingly using color to stand out and communicate naturalness, authenticity or mood.”

The numbers confirm this shift. FMCG Gurus’ 2025 Clean Label and Naturalness

[survey](#) showed more than half (54%) of global consumers find natural color claims influential in purchasing decisions, with 22% willing to pay premium prices for these ingredients. More telling, 52% would now compromise on visual vibrancy to ensure natural coloring, a dramatic departure from when synthetic brilliance dominated.

This consumer evolution creates a technical paradox that has sparked unprecedented innovation. These 10 brands aren’t just riding the natural trend; they’re solving fundamental technical challenges that historically may have limited the performance of natural colors and flavors. Their breakthroughs provide a technical roadmap for R&D professionals navigating the complex intersection of consumer expectations and formulation reality.



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californianaturalcolor.com





Goodles – Nutrient-rich mac and cheese

Founders: Jen Zeszut and Paul Earle

The story: Goodles was founded with a mission to reinvent the mac and cheese category with a version that is equally as nutritious as it is delicious. The healthier alternative wasn't just created for kids, but for people of all ages to enjoy.

Why it's a game changer: Formulated with a custom, plant-based nutrient blend, Goodles' products contain 15 g of protein and 6 g of fiber in each 1-cup serving. It's also the first boxed mac and cheese brand to receive Clean Label certification.

Molly Michet, chief product officer at Goodles, described the challenges of working with nutritional ingredients, noting, "Protein is dense, strongly flavored, darkly colored and sticky; fiber can be gritty and dark; and vitamins and minerals can have a strong flavor." She highlighted that her company overcomes these obstacles through its specialized team of food scientists who combine industrial ingredients with culinary expertise to create nutritious products that don't sacrifice taste.



Pitaya Foods – Swirl smoothie bowls

Founders: Chuck Casano and Ben Hiddlestone

The story: After working for a nonprofit in Nicaragua, Casano realized many of the tropical fruits he enjoyed abroad weren't readily available in the U.S., so he set out to change that. "The journey to bring superfruits to the masses began," he said, and today, the company offers a range of frozen products with USDA Organic and regenerative fruits harvested using sustainable farming practices and fair working conditions.

Why it's a game changer: Swirl smoothie bowls represent a nutritionally dense formulation, incorporating a comprehensive vitamin profile and authentic fruit components while maintaining a clean label free from artificial colorants and flavor enhancers. The product architecture features strategic layering of contrasting textural elements – such as coconut particulates and chocolate fudge emulsion – creating multisensory appeal.

"They offer visual excitement, flavor depth and a smoothie shop-like experience right at home ... designed for today's health-conscious but convenience-driven consumer," Casano said.



Häppy Candy – Better-for-you gummy candy

Founder: Maxi Heidenblut

The story: When Heidenblut moved to the U.S. from Germany in 2019, she was put off by “healthier” candy options that included artificial sugars and excessive fiber. As such, she developed a clean-label, low-sugar gummy candy with natural flavors and colors, and no additives or alternative sugars.

Why it’s a game changer: Häppy Candy’s heart-shaped, vegan gummies contain 70% less sugar than traditional options. They’re also free of sugar alcohols, alt-sweeteners, and artificial colors or flavors.

“Our colors are naturally derived from fruits and vegetables, requiring precise control of processing variables like heat, pH and exposure time to maintain stability,” Heidenblut said. “To protect color integrity over shelf life, we use fully light-blocking packaging without a window, minimizing light degradation.”



Rivalz – Vegan stuffed snacks

Founder: Peter Barrick

The story: With a mission to elevate better-for-you snacks – which often miss the taste mark and are packed full of empty calories – Barrick strived to create products reminiscent of childhood favorites. Rivalz is “flipping the script on snacking” with its one-of-a-kind, dual-textured, multiflavored stuffed snacks that pack “purposeful nutrition.”

Why it’s a game changer: Rivalz’ flavor-forward options offer all of the taste plus nutrition without the artificial additives, preservatives and added sugars. The Non-GMO Project Verified nibbles are vegan and gluten-free, with 8 g of plant protein, 4 g of fiber, and seven essential vitamins and minerals per 1-ounce serving.



Teton Waters Ranch – Grass-fed, grass-finished beef products

Founder: Jeff Russell

The story: Teton Waters Ranch is on a mission to nourish families and the planet with 100% grass-fed, grass-finished beef. Sourced from ranchers who uphold regenerative agriculture practices and Certified Humane standards, each product reflects a deep commitment to animal welfare, environmental health and high-quality food.

Why it's a game changer: All products (except the frozen burgers) incorporate plant-based powders, which serve as natural colorants and preservatives.

Kevin Pallaoro, CEO of Teton Waters Ranch, said, “We never use artificial nitrites or nitrates. We use ingredients such as cherry powder and celery powder as natural antimicrobials to help prevent oxidation, maintain color and protect against pathogens for the safety of our consumers.”

Check out the rest of the list of game-changing brands, on page 22.



watch

Sustainable packaging: Better ways to ensure shelf stability – webinar

Bridge the gap between planet-friendly and making sure your product can stay on the shelf for as long as possible.



Garden-variety
delicious:
Umami brings
meatiness
to meat-free
applications
by Kimberly J. Decker



Umami is one of those words that means what it says. A portmanteau of *umai*, Japanese for “delicious,” and *mi*, meaning “taste,” it really *is* all that – and a whole lot more.

That’s because umami encompasses not just its namesake “deliciousness,” but also a deeply savory character that’s turned it into a not-so-secret weapon for rounding out profiles and plugging whatever flavor gaps a formulation may have failed to fill.

For brands breaking ground in the alt-protein space, umami can be strategically deployed to convey a certain meatiness to products that don’t contain meat – a true boon in leveling the meat-free playing field.

Chemical roots

The association between umami and meatiness is no accident. In fact, it’s chemistry.

Namely, when the amino acid glutamate and 5'-ribonucleotides like inosine-5'-monophosphate (IMP) and guanosine-5'-monophosphate (GMP) bind to receptors in a person’s taste buds, they signal to the brain that umami’s on the way.

Because these umami-inducing compounds abound in animal meat, the human mind, over time, conflated the two: *Umami equals meatiness.*



Several signature umami icons – **soy sauce, miso, olives, kombu, even green tea** – are all plant-based.



Umami icons

Andrew Hunter, a chef who advises restaurateurs, retailers and other chefs on strategic product development, noted, “While umami compounds may be less abundant in plants, plants still contain plenty of them.”

As an example, several signature umami icons – soy sauce, miso, olives, kombu, even green tea – are all plant-based.

What’s elevated them to top-tier umami status, Hunter contended, isn’t just their complement of umami precursor compounds, but what formulators have done to liberate them.

Free the umami

Hunter explained, “If you really want to extract umami from a plant base, you first need to understand its amino acid composition.” Specifically, he reiterated, the more glutamate, the better. “Then,” he continued, “you have to consider how to pull them out and incorporate their attributes into your products.”

Mushrooms, he proposed, offer an apt illustration.



Their [surprisingly high](#) stores of glutamates and nucleotides undergird a meaty taste that comes naturally. Beyond that, Hunter said, “When we expose mushrooms to heat, we liberate these compounds while also triggering the Maillard reaction that caramelizes foods and makes them craveable.”

Heat is hardly a food scientist’s only tool. Hunter pointed to brewing mushrooms – as in a tea – or curing, drying or fermenting them. “All these processes factor into the umami flavor equation,” he stated.

Magical mold

Hunter also called out koji, another fungi, which he described as “the bubbly mash of soy sauce.”

More specifically, koji is the mold *Aspergillus oryzae*, whose network of threadlike hyphae grows on substrates such as soybeans, releasing protease enzymes that digest their proteins into the amino-acid building blocks that make umami happen.

“So if you stop making soy sauce with koji and use it as an ingredient,” Hunter reasoned,

Flavors

“it enhances umami, and I think it’s really interesting.”

Koji in the deli

The team behind CPG company Prime Roots agrees, considering the brand uses koji as the foundation for its plant-based deli meats, bacon and pepperoni.

According to Joshua Nixon, Prime Roots’ co-founder and CEO, “Our clean fungi proteins are doing most of the work in that they’re naturally meaty, with powerful umami.”

Unlike alt-meats that lean on soy, gluten or pea as their base, Prime Roots’ koji meats don’t need a lot of after-the-fact flavor futzing to get their profiles just right. “These other bases don’t naturally have a lot of umami,” Nixon claimed, “whereas we achieve a state of natural meatiness using our whole-food fungi and without a long ingredient list.”

That said, Nixon noted, “We pay attention to all parts of the palate, from the front to the back,” which is why the brand leverages umami *and* flavor toward creating a panoramic meat-eating experience. “For example,” Nixon said, “we use juniper berries in our Black Forest ham to give it the authentic taste of traditional Austrian-German Black Forest ham.”

Umami neutrality

Prime Roots’ ethos is a “mix of art and science” that Nixon believes is “pushing the forefront of plant-based development.” But it’s also very specific to the company’s alt-deli meats.

Aaron Rasmussen, head of global applications at yeast-focused ingredient supplier Ohly, pointed out, some plant-based formulations benefit from a more neutral means to umami.

The flavor-forward chef and scientist said, “Using mushroom powder in a plant-based chicken broth will generate umami, but it’ll be brown and taste earthy.” Yeast extracts, by contrast, “offer a clean-label, vegan alternative that’s low in color with high concentrations of naturally occurring nucleotides and glutamic acid.”

Yeast extracts also moonlight as flavor modulators, tamping down off flavors, enhancing perceptions of saltiness and heightening the roasted meatiness that alt-meat formulations chase – all at low cost in use.

“Yeast extracts are ideal in these applications, as you can easily adjust the amount to bring up desirable flavors and help mask off-notes without adding other tastes,” Rasmussen advised.

If a brand isn’t quite sure how to work with the ingredients, many companies have applications experts on staff who can help. “We have a trained panel who evaluates the end application to identify initial, mid- and aftertaste profiles, as well as any off-notes,” Rasmussen explained. “Next, we use our masking toolbox, and the panel will rerate the different attributes of the flavor profile in terms of timing and intensity to show the effectiveness of masking and flavor modulation.”

It all comes down to a little bit of art, a little bit of science – and a whole lot of umami. ■



Kimberly J. Decker is a Bay Area food writer who has worked in product development for the frozen sector and written about food, nutrition and the culinary arts. Reach her at kim@decker.net.



The science of culinary translation: From chef's kitchen to commercial scale

by Cindy Hazen

When a restaurant delivers a meal that is magical, whether the ingredients are simple or complex, it's typically a chef's expertise that causes them to shine. A diner's senses can be aroused by colors, textures, flavors and aromas. A dish's concept starts with ingredient pairings, but the techniques the chef uses allow the flavors to evolve. Some flavors become bolder, some become more subtle and some develop into something different.

The same flavor development can occur in a manufacturing setting, but translating a chef's hands-on perfection to a commercial scale is challenging. One-by-one plating is replaced by hundreds, if not thousands, of meals assembled in rapid-fire succession. Instead of a saucepan or skillet, machinery now does the heavy lifting. The intuition that a chef uses must be replaced by the seasoned knowledge of R&D and engineering professionals who can anticipate the way that products will transition through scale-up, storage, distribution and then finally, consumer use.

The importance of time

From a culinary perspective, time is essential to flavor development. In manufacturing, time is money. Food developers must rely on other



methods to mimic the results that chefs can achieve in a less hurried environment.

Take focaccia bread, for example. Janet Bourbon, culinary advisor for ingredient giant Cargill, noted, "A long dough fermentation period builds a flavor depth and complexity that's difficult to reproduce on a fast-moving production line." She suggested manufacturers turn to flavor concentrates to approximate those profiles, but she cautioned some flavor characteristics can only truly be achieved with time.

Slow braising, fermentation and resting are tools that by definition rely on a lengthened process to develop flavor. Ryan Kukuruzovic, executive chef and culinary manager at Wixon, discussed how his company manages flavor development in industrial food production. According to Kukuruzovic, "In production,

Production strategies



In commercial production, variables like timing, temperature and ingredient addition become less flexible.

we replicate these effects using techniques like vacuum tumbling, steam injection or accelerated thermal processes.” He elaborated that time is a critical factor affecting enzymatic reactions and Maillard browning, which his team addresses by identifying crucial flavor development stages and creating specialized processes that maintain quality while reducing production time.

Chemical and molecular transformations are central to the flavor development of many foods. Besides the Maillard reaction, Kukuruzovic mentioned caramelization, emulsification and starch gelatinization. “Technically, these involve protein denaturation, retrogradation and lipid oxidation,” he stated. “Heat mapping and pH control may be employed to ensure these transformations/reactions occur under controlled, repeatable conditions.”

Processes like Maillard browning and caramelization contribute to flavor and appearance. Similarly, Christine Nowakowski, category innovation advisor for indulgence at Cargill, noted, “Reactions like emulsification or crystallization can have a major impact on a product’s texture and stability.” She said the challenge is identifying which of these processes are central to the product’s identity. Those are the intricacies that must be preserved through scale-up to maintain sensory cues.

Scaling up

Scaling a recipe from a chef’s kitchen to an industrial facility isn’t just a matter of multiplying ingredients. “In commercial production, variables like timing, temperature and ingredient addition become less flexible,” Nowakowski pointed out. “Unlike a chef who can adjust heat on the fly or add ingredients by taste, large-scale systems operate with preset parameters and longer transition times.”

As part of the scale-up process, adjustments must be made. “In formulation, changing the order of ingredient addition or modifying cook times are often necessary,” Nowakowski said. “Take candy manufacturing. Small batches might be made with sugar manually stirred in copper kettles. At industrial scale, manufacturers might need to include corn syrup to prevent crystallization.”



Production strategies



Savory products also require adaptations. Adjusting the order of addition is one of the easiest, according to Nowakowski. Using the example of a chef's kitchen, she said that sautéing mushrooms in butter before adding them to a soup develops rich flavors. Sautéing is less practical on the production line, but she said the effect can be simulated by starting with the fat and then adding sliced mushrooms, before introducing other components of the soup.

Sometimes equipment changes are required to simulate the effects that can be achieved in a kitchen. Kukuruzovic mentioned, "We mimic culinary processes using steam-jacketed kettles for reductions, vacuum tumblers for marination and high-shear mixers for emulsions. On the technical side, infrared searing, staged

cooking and continuous inline processing are deployed to replicate culinary timing, texture and flavor development."

Some techniques – such as flame-searing, hand-laminating doughs or reducing sauces – require human intuition. "At scale, engineers face challenges with open-system variance and precise control," Kukuruzovic continued. "We can simulate these outcomes using flame tunnels, robotic shaping or flavor layering to approximate artisan techniques while meeting production needs."

Keeping quality in check

Maintaining the desired flavor in fast-paced, equipment-driven manufacturing environments is key. "Most typical flavor loss occurs from overcooking, aggressive mixing or long hot-hold periods," Kukuruzovic shared. "Preserving flavor requires careful process design – adjusting heat transfer, mixing speeds and formulation stability to retain key sensory elements." Monitoring thermal load, shear force, oxidation, and pH or water activity can help ensure the product retains quality parameters.

Brad Wright, R&D director for bakery and snacks at Cargill, emphasized the dual-methodology approach required for comprehensive sensory evaluation in commercial food production. "When it comes to ensuring consistent sensory quality at scale, manufacturers rely on a combination of analytical instrumentation and human evaluation," he noted.



read

Formulating with lavender requires careful attention to flavor, color

Lavender is showing up in more products, and more types of products, than ever. But it requires a careful touch and a well-informed approach.



As the supply chain gets more complicated, concerns around **stability** and **temperature control** increase as products move through the distribution chain.

The quality assurance protocol integrates sophisticated chromatographic analysis with trained human assessment panels. Specifically, techniques such as solid phase microextraction coupled with gas chromatography enable precise identification and quantification of volatile aromatic compounds that define product flavor profiles. Nevertheless, Wright acknowledges that instrumental analysis alone provides an incomplete sensory characterization, necessitating supplementation with trained descriptive panels who systematically evaluate organoleptic changes.

These specialized sensory professionals conduct methodical assessments of critical parameters – including flavor compound stability, chromatic attributes and aromatic volatile profiles – throughout the product’s designated shelf-life continuum.

Kukuruzovic echoed the importance of human panels to ensure flavor fidelity. He said Wixon also uses analytic equipment, such as gas chromatography, mass spectrometry and texture analyzers to validate consistency. Using both trained tasters and instrument-based methods can provide a more complete view of product quality from test kitchen to production floor.

Mind the p’s and q’s

As products are scaled from the culinary space to large-scale manufacturing, regulations change. Food safety is a consideration in any environment where food is prepared, but as product is scaled, so is the risk. The government requires a food safety plan, a food defense plan, a food fraud plan and a plethora of policies and procedures. Sanitation needs become more complex as equipment becomes larger and contains more welds, tubs, tubes, belts, nooks and crannies. Nowakowski advised, “Additionally, as the supply chain gets more complicated, concerns around stability and temperature control increase as products move through the distribution chain.”

Labeling is another important concern at the commercial level. Ingredient statements must accurately reflect the product’s contents, with Nutrition Facts labels becoming mandatory. This, Nowakowski said, requires nutritional analysis and standardized formulas. Then one has to keep in mind the always-changing regulatory environment. Front-of-packaging labeling, for example, will require labels to incorporate certain nutrition highlights on the front panel; although as of this writing, the final format hadn’t been decided. From time to time,

Production strategies

new allergens are required to be labeled. Who knows what is on the government's horizon?

What's next in food development

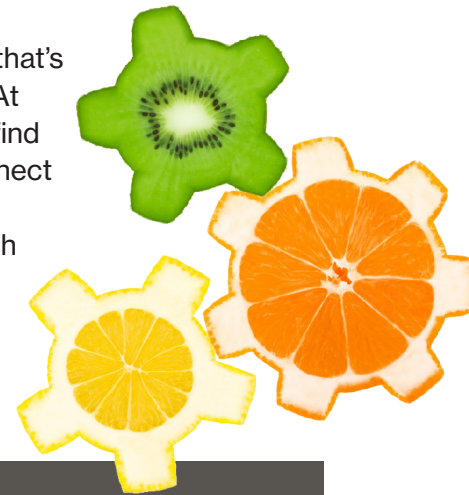
Encapsulated flavors, precision fermentation and high-pressure pasteurization for fresh flavor retention are all resources that can help support culinary authenticity. Kukuruzovic observed, "Beyond that, we're seeing AI (artificial intelligence)-assisted process controls, flavor recovery systems and predictive modeling used to ensure that artisan quality is not lost during scale-up." He added, "Newer systems like multizone kettles, modular searing tunnels, robotic sheeters and smart forming belts are helping culinary and technical teams work together to preserve handmade textures, layered flavors and authentic appearance at scale."

Nowakowski offered 3D printing as one example of new technology, as it allows the creation of intricate designs that previously could only be done by hand. "But it's not just equipment that helps bridge the gap," she said. "Some manufacturers are crafting semi-finished components like ready-to-fill truffle shells or premade chocolate decorations –

shortcuts that still allow end users to add their own artisanal touches."

"Then there's late-stage customization like ready-to-assemble meal kits," she continued. "It's a hybrid approach that lets the consumer or foodservice operator handle the final preparation step, preserving a bit of culinary craftsmanship in the final product."

Even as the industry evolves, some things are basic. Alex Blissenbach, food scientist at Cargill, offered a fitting analogy: "Ultimately, I think of the scale-up process like Picasso's famous drawings of a bull, where he gradually refined the image down to its essential form. That's what we're tasked with, when we move from the culinary space to industrial scale: preserving what's central to the product's identity. But that's only half the process. At the same, we need to find sensory cues that connect with consumers at an emotional level. Do both and we have a recipe for success, even at industrial scale." ■



read

TikTok, nostalgia, sustainability shape consumer preferences for F&B products

Younger consumers prioritize sustainability and transparency in ingredient sourcing. That was a major takeaway from a SupplySide session in Las Vegas.



[Cindy Hazen](#) is a food industry professional with decades of experience in food formulation and food safety. She is PCQI, HACCP and ISO 22000 trained.



Lexington Bakes – Luxury cookies, brownies and oat bars

Founder: Lex Evan

The story: Lexington Bakes offers eco-conscious, luxury baked goods using organic, fair-trade ingredients with ultimate transparency (trademarked as “No Naughty Ingredients” and “Radical Ingredient Transparency”). Evan’s passion for baking with these types of ingredients led him to create the company to help consumers “feel good about dessert.”

Why it’s a game changer: The company’s focus on hypertransparency is what truly sets it apart, along with the organic and fair-trade ingredients used to make its square-shaped treats. Natural flavors manifest in offerings derived from pure chocolate, tahini and maple syrup.



Little Bellies – Organic snacks and foods for babies and toddlers

Founders: Clive Sher and Steven Sher

The story: After one of the Sher brothers’ children was diagnosed with a severe food sensitivity, it prompted them to create foods for babies and toddlers that removed the worry for many parents. Their mission is to make natural, simple, yet high-quality food for tots, which are age appropriate, not sweetened or salted, and free from artificial additives and GMOs (genetically modified organisms).

Why it’s a game changer: While many packaged baby foods inadvertently include high levels of heavy metals, Little Bellies is committed to offering products with Certified Organic ingredients from suppliers that have been specially screened and tested to better ensure they are safe. The brand derives flavors from dried organic fruit and vegetable powders, whole grains and other natural ingredients, tailored to specific developmental stages and changing taste palettes.



Force of Nature Meats – Grass-fed and regeneratively raised beef, bison and wild game

Founders: Robby Sansom, Katie Forrest and Taylor Collins

The story: Force of Nature Meats is dedicated to revolutionizing the meat industry with a focus on sustainability and ethical sourcing. Rooted in the principles of regenerative agriculture, the company's mission is to provide consumers with a variety of meats that are responsibly harvested from free-roaming animals.

Why it's a game changer: The company's animals are raised in nutrient-rich ecosystems without standardized, grain-based diets, which contributes to more flavorful offerings. Processing practices are also minimal, using organic, clean-label, non-GMO and nonirradiated spices, as well as vacuum packaging, which reduces the need for preservatives.

Sansom explained, "This [packaging] method not only extends shelf life but also maintains color, moisture and freshness without compromising our clean-label promise."



Brooklyn Delhi – Premium Indian sauces and ready-to-eat (RTE) meals

Founder: Chitra Agrawal

The story: Agrawal wanted to bring more awareness to traditional Indian cuisine in the U.S., which prompted her to found the company that offers a range of Indian condiments, sauces and RTE meals.

Why it's a game changer: Brooklyn Delhi's products are free of artificial ingredients, naturally non-GMO, and rely on natural ingredients to create vibrant colors and standout flavors.

"We use only the ingredients that I cook with at home in our products, so the colors come from the red in paprika, the yellow in turmeric, etc.," Agrawal said. "I play around with different acids in my kitchen, like lemon juice and tamarind, that help with preservation to ensure that our products are shelf-stable but don't contain ... preservatives like citric acid. Our jarred products are shelf-stable for three years, naturally, using the recipes I developed."



Dave's Killer Bread – Organic snack bites

Founders: Dave Dahl, Jim Dahl, Glenn Dahl and Shobi Dahl

The story: Dave's Killer Bread is founded with the dual purpose of offering high-quality, USDA Organic bread and providing second chances to individuals with criminal backgrounds (inspired by co-founder Dave Dahl's experience with incarceration).

Why it's a game changer: Dave's has introduced a novel organic snack bite portfolio, featuring both savory and sweet profiles, formulated with nutrient-dense substrate components, including various wholesome seed and nut varieties, while maintaining a clean-label positioning devoid of synthetic additives.

The company's technical documentation indicates these textured products address multiple consumption occasions through their sensory versatility, while "the expanded flavor profiles also increase the snack bites' versatility, serving as a great addition to salads or bowls ... yogurt, ice cream and more." The differentiated flavor development strategy includes specialized variants such as Cinna Roll, PB & Chocolate, and Honey Nut, each leveraging minimally processed, naturally derived ingredient systems. ■



Heather Carter is a seasoned business-to-business editor with more than 15 years of experience spanning local news and trade publishing. She regularly covers trending topics like better-for-you CPGs, plant-based innovation, international ingredients and scientific advances spanning fermentation to functional beverages.

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