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November 2025

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WHAT CONSUMERS REALLY WANT IN THEIR HOME CARE AND CLEANING PRODUCTS

Consumer insight platform Yogi's vice president breaks down what matters most in home care purchases.

The Rise of Prestige Fragrance in Laundry Care: Q&A with Laundry Sauce COO

Back to the Bun: Authenticity is Key in Savory, Blended Proteins

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Fortune Favors the Fold



We want to create our own unique scent experience, and that begins with our clothing.

Laundry is one of the only household tasks I actually enjoy. There's something therapeutic about separating the loads, taking the warm clothes out of the dryer, smelling the clean scent while folding. It feels like a mental reset; a refresh on my wardrobe and my home.

The home care segment is upping its game in terms of fragrance, delivering more sophisticated, long lasting scents with unexpected twists. While there will always be a market for the fresh, clean linen scents in laundry, more brands are coming out with bold laundry fragrances.

Some examples: Snif launched its Old Money everything wash detergent last spring with notes of cardamom, tonka bean, coumarin, vanilla and sandalwood. Laundry Sauce added Mojave Peach to its premium fragrance lineup this summer. Bath & Body Works' Disney villains collection includes laundry detergent available in its Maleficent and Evil Queen scents (finally, my clothes can smell like my favorite villain!).

I've been thinking about where this movement for bold, sophisticated fabric care comes from, and I believe it goes back to personalization. We want to create our own unique scent experience, and that begins with our clothing. Robert Cardiff, co-founder and chief operating officer of Laundry Sauce, told us in his Q&A interview that scent boosters are trending for this exact reason. Users can add as much or as little as they want, allowing for that personalized touch. Blend that with the fragrance layering trend and increased interest in "soft living" (using fragrance as a connector to mental wellbeing), and you've got a unique scent story right in your home.

The home care segment is becoming an interesting one to watch. Performance will always be crucial for these products, but the sensory aspects are becoming just as important. They have the power to turn ordinary household chores into experiences. Maybe I'd be more inclined to wash my dishes with a dish soap infused with a premium fragrance.

We all know the phrase: cleanliness is close to godliness. Maybe the phrase needs to be updated to include good scents, too.





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FEMA 2400 Natural Gamma Dodecalactone, Chiral
FEMA 2361 Natural Delta Decalactone, Chiral
FEMA 2401 Natural Delta Dodecalactone, Chiral
FEMA 3590 Natural Delta Tetradecalactone, Chiral

Natural Specialties

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FEMA 2720 Natural Methyl 3-Methylthiopropionate
FEMA 3310 Natural Methyl Thiobutyrate
FEMA 3343 Natural Ethyl 3-Methylthiopropionate

FEMA 3155 Natural 2-Ethyl-3-Methyl Pyrazine
FEMA 3919 Natural 2-Ethyl-6-Methyl Pyrazine
FEMA 3149 Natural 2-Ethyl-3(5 or 6)-Dimethyl Pyrazine
FEMA 4434 Natural 2-Ethyl-5,6-Dimethyl Pyrazine
FEMA 3208 Natural 2-Methyl-3-Methylthio Pyrazine
FEMA 3132 Natural 2-Methoxy-3-Isobutyl Pyrazine
FEMA 3358 Natural 2-Methoxy-3-Isopropyl Pyrazine
FEMA 3433 Natural 2-Methoxy-3-Secbutyl Pyrazine
FEMA 3964 Natural 2-Acetyl-3-Methyl Pyrazine
FEMA 3134 Natural 2-Isobutyl Thiazole
FEMA 3555 Natural 2-Isopropyl-4-Methyl Thiazole
FEMA 3680 Natural 2-Ethyl-4-Methyl Thiazole

Ingredients



Magnolan

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https://www.symrise.com/scent-and-care/aroma-molecules/perfumery-ingredients/#Magnolan

The legendary and original Magnolan® by Symrise (CAS #27606-09-3) stands out with its rich floral elements of magnolia, peony, lily of the valley and grapefruit facets. With its complex and transparent characteristics, the creative key ingredient inspires floral creations. Magnolan® delivers white blossom inspiration serving as a fragrance all-rounder.

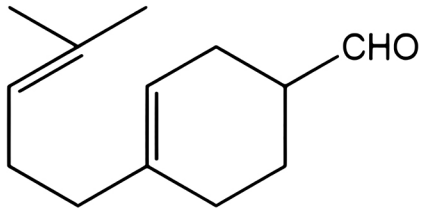


Methyl-T2-Hexenoate, Natural

Penta Fine Ingredients

http://www.pentafineingredients.com/

Methyl-T2-hexenoate (FEMA #2709, FLAVIS #09.181, JEFCA #1809) contains a flavor profile of intense, powerful pineapple with odor properties described as fatty, sharp green-fruity pineapple. Our material is Kosher and Halal Compliant.



Myrac Aldehyde

Hangzhou Grascent Co, Ltd

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Myrac aldehyde, or 4-(4-methyl-3-penten-1-yl)-3-cyclohexene-1-carboxaldehyde and 4-(4-methyl-3-pentenyl) cyclohex-3-ene-1-carbaldehyde, has floral, green, muguet, fresh and fruit notes. Possible applications include fine fragrance, beauty care, soaps, laundry care and household cleaning products.



EvolutionSoy

Avant Organics

avantorganics.com

EvolutionSoy (1076TM and 1077TM) is a cutting-edge flavor innovation crafted to transform the way soybean-based products are experienced. Specially designed to elevate both taste and texture, EvolutionSoy enhances the natural flavor of soy while refining its mouthfeel, creating a smoother, more enjoyable bite. By reducing unwanted notes and boosting overall palatability, it allows formulators to unlock the full potential of soybean applications, whether in beverages, snacks, or plant-based proteins. With EvolutionSoy, developers can deliver soy-forward products that are not only nutritious but also indulgent, ensuring consumers savor every sip and bite with satisfaction. Avant Organics provides this material as EU Natural, Kosher and non-GMO and has the option of ethanol or propylene glycol as a carrier. For your free sample please email info@avantorganics.com.

Images courtesy of the manufacturers



Eriodictyol, EU Natural

Xiamen Bestally Biotechnology Co, Ltd

http://www.bestally.com/EN/Index.html

In sensory studies of flavanones homoeriodictyol, its sodiumsalt (1-Na), sterubin (2), and eriodictyol (4) could significantly decrease the bitter taste of caffeine without exhibiting intrinsic strong flavors or taste characteristics.



Bacon Dithiazine, Natural

Axxence USA

www.axxence.com

Bacon Dithiazine (FEMA #4017, CAS #74595-94-1) is valued for its ability to deliver fried, roasted and meaty notes. It provides the authentic taste of crispy bacon, chicken skin, seared beef or roasted potato skins, adding depth and realism to savory formulations. With its distinctive fatty, umami-rich profile, bacon dithiazine is widely used in snack seasonings, meat flavors and roasted vegetable applications to achieve a balanced, cooked fat note.



BEYOND CLEANING: TRENDS DRIVING INNOVATION IN LABELLING, SUSTAINABILITY, AND REGULATORY COMPLIANCE

SPONSORED BY SOLVAY



By incorporating Augeo® Clean Multi into cleaning formulations, it is possible to develop high-performing, safe, and sustainable products that address both consumer expectations and regulatory requirements.

In cleaning product development, formulators are always seeking ingredients that **improve performance, sustainability, and user experience**. Augeo® Clean Multi, a high-performance solvent, has emerged as a key solution, particularly for enhancing fragrance delivery and overall cleaning efficacy. Derived from a renewable source, Augeo® offers a unique combination of technical benefits, sustainability, and safety characteristics.

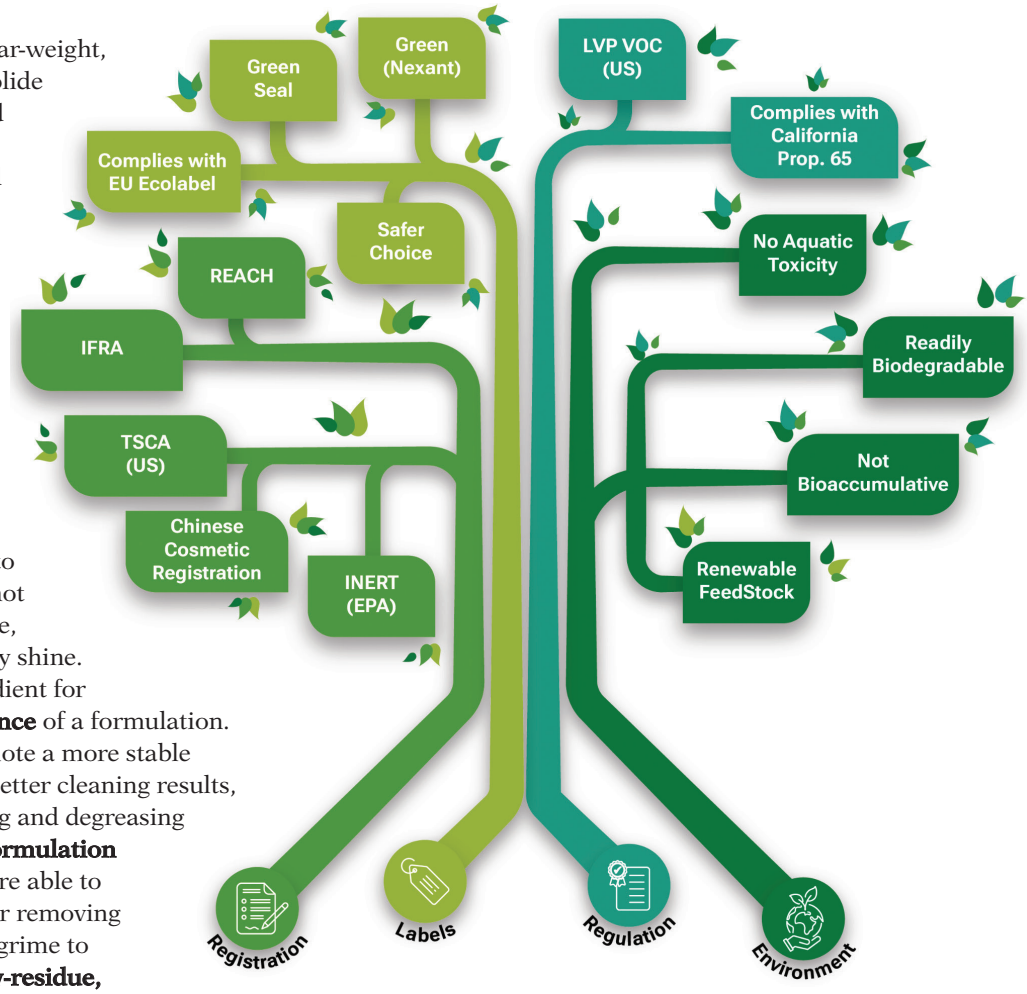
Traditional solvents often struggle to dissolve the diverse range of compounds used in modern fragrances, leading to stability issues and a compromised scent experience. One of the most significant advantages of Augeo® is the ability to **enhance fragrance performance in cleaning formulations**. Augeo® stands out due to its exceptional solvency power, **allowing the solubilization of a wide variety of fragrance components**, from highly crystalline, polar powders such as vanillin and

Courtesy of Solvay

maltol, to non-polar, high-molecular-weight, viscous compounds such as galaxolide and β-caryophyllene. The balanced solubility ensures that the entire fragrance profile is fully integrated into the cleaning formulation, resulting in a more stable and uniform product with a richer, more authentic scent.

Augeo® solvency power also contributes to a **longer-lasting fragrance experience**. It improves the perception of scent over time by fully dissolving the fragrance molecules, enhancing the perceived quality and freshness after cleaning. Due to its low-odor profile, Augeo® does not mask or interact with the fragrance, allowing the intended scent to truly shine.

Augeo® is also a valuable ingredient for **improving the cleaning performance** of a formulation. It acts as a coupling agent to promote a more stable and cohesive formula, leading to better cleaning results, and possesses excellent solubilizing and degreasing properties that **optimize overall formulation performance**. Thus, formulators are able to develop more effective products for removing a wide range of soils, from greasy grime to particulate matter, resulting in **low-residue, fast-drying formulas** that leave surfaces clean, shiny, and streak-free, which is particularly important for glass and wood cleaning applications



In cleaning product development, formulators are always seeking ingredients that improve performance, sustainability, and user experience.

In addition to delivering superior cleaning performance, formulations must also align with evolving safety and sustainability concerns. In this regard, Augeo® Clean Multi offers compelling benefits that exceed industry standards:

- **Biodegradability:** It is **readily biodegradable**, breaking down quickly and safely in the environment.
- **Low Toxicity**: Non-toxic, with a **skin-friendly profile**, free from known allergenic compounds. It also presents **no aquatic toxicity** or any environmental hazard classification, making it a safer choice for both formulators and end users.
- **Renewable Sourcing**: Derived from renewable sources, supporting the development of more sustainable products. It **reduces the carbon footprint** and reliance on fossil-based ingredients, while enhancing the carbon renewability of the final product.

From a regulatory standpoint, Augeo® Clean Multi is well-positioned for global markets. It is approved for use in products seeking **Ecolabel** and **Nordic Swan** certifications in Europe. In the United States, it is listed on **CleanGredients** as a **Safer Choice**-approved chemical, confirming its compliance with strict safety and environmental standards.

Additionally, Augeo® is classified as an **LVP-VOC (Low Vapor Pressure-Volatile Organic Compound)** under **EPA/CARB** regulations. This classification implies no usage limitations, making it an ideal choice for a wide range of products that must comply with **stringent VOC restrictions**, such as general-purpose cleaners, degreasers, and glass cleaners.

By incorporating Augeo® Clean Multi into cleaning formulations, it is possible to develop high-performing, safe, and sustainable products that address both consumer expectations and regulatory requirements.

In addition to enhancing the functional and sensory attributes of cleaning products, Augeo® offers a unique combination of **low toxicity, biodegradability, renewable sourcing, and regulatory compliance**, making it an innovative solution for today's formulation challenges.

IFF Announces Bioprospecting Partnership with Reservas Votorantim in Brazil



Images of Legado das Águas – Atlantic Forest Reserve in Brazil.

Flavor and fragrance company IFF announced a new partnership with Reservas Votorantim, the green economy division of Brazilian investment firm Votorantim SA, for research and bioprospecting in Legado das Águas, Brazil's largest private Atlantic forest preserve.

The agreement provides IFF and LMR Naturals exclusive access to the native flora of the area with the goal of developing new extracts for perfumery and cosmetics. According to the company's press release, IFF will build a new research lab within Reservas Votorantim's existing site to allow experts to study and analyze the flora.

"Our partnership with Reservas Votorantim enables IFF to sustainably source fresh and inspiring ingredients from one of the planet's most ecologically unique biomes, helping to further appreciation for Brazil's Atlantic forest," said Charbel Bouez, senior vice president of R&D for IFF Scent. "The combination of Reservas Votorantim's strong community roots and LMR's deep expertise in natural ingredients is uniquely positioned to deliver exciting innovations in fragrance and cosmetic ingredients."

Officials from both companies hope that this partnership will help expand knowledge of Legando das Águas' natural flora and serve as a model for biodiversity-driven innovation.

"Since Legado das Águas was established 13 years ago, we've made consistent investments in scientific research, driven by the belief that deeper knowledge of the forest would unlock new opportunities," said Reservas Votorantim chief executive officer David Canassa. "Bioprospecting offers a range of solutions for society, which is why we began developing it years ago – culminating in what we believe is the largest genetic bank of Atlantic Forest species. It's a powerful ally in advancing conservation."

IFF will also participate in community outreach programs in the area designed to provide best practices in conservation methods and promote native plant cultivation. p&f+

Courtesy of Reservas Votorantim

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T. Hasegawa Introduces HASECITRUS Technology to Stabilize Citrus Flavor in Beverages

California-based flavor company T. Hasegawa USA announced the launch of HASECITRUS, a natural flavor-stablizing product designed for beverage applications. This ingredient protects citrus flavors from the "dulling" effects of oxidation that affect color, aroma and taste.

Citrus flavor oxidation is caused by reactions between the flavor and oxygen, pH and temperature. This can affect the shelf stability and flavor consistency of beverage products.

"Citrus beverages are becoming increasingly complex in categories like sports nutrition and energy that feature added functional ingredients like protein and electrolytes – but consumers also want clean-label, preservative-free products," said Mark Webster, vice president of sales and marketing. "This is driving demand for new technologies like HASECITRUS that enable manufacturers to overcome the effects of oxidation and offer natural flavor beverages that remind consumers what fresh citrus tastes like."

HASECITRUS launches in eight flavor variants: lemon, lime, orange, blood orange, navel orange, lemon lime, white grapefruit and pink grapefruit. The ingredients are currently only available in liquid form, with a dry powder option available upon request. The company claims that the technology helps maintain citrus flavor for longer periods without refrigeration or special packaging.



Citrus flavor oxidation is caused by reactions between the flavor and oxygen, pH and temperature.

This new flavor technology was developed as part of T. Hasegawa's "Bridge to Tokyo" program, which combines the expertise and innovations of the company's global headquarters in Japan and its U.S. subsidiary.

"We aim to identify production challenges facing the food and beverage industry and address these issues with innovative science-based flavor solutions," said senior food chemist Masashi Miyamoto. "HASECITRUS is the result of a long process of adapting T. Hasegawa's existing technologies to serve manufacturing needs in North America."

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Courtesy of T. Hasegawa

Revlon, Christina Aguilera Renew Fragrance License Agreement



The collaboration between Revlon and Aguilera has spanned more than ten years, with the successful launches of lines such as Signature, Definition and By Night.

Revlon announced the renewal of its beloved fragrance license agreement with Grammy-winning recording artist Christina Aguilera. Revlon and Aguilera will launch a new fragrance in 2026 aimed at younger consumers.

The collaboration between Revlon and Aguilera has spanned more than ten years, with the successful launches of lines such as Signature, Definition and By Night. Through this renewed deal, both parties hope to focus on expanding the brand's global fragrance portfolio with a focus on younger audiences.

"Fragrance can define a moment, enhance a moment and even create a memory," Aguilera said. "I have loved developing scents and building my fragrance brand with Revlon over the past decade, and I am thrilled to continue this creative journey as I bring more special fragrances to people all over the world."

Michelle Peluso, chief executive officer of Revlon, added, "We are excited to extend our long-standing collaboration with Christina Aguilera, a valued creative partner whose vision and influence have helped shape one of the most successful celebrity fragrance portfolios in the industry. As we continue to grow our presence in the celebrity fragrance space, we look forward to building on this significant relationship for many years to come. Christina's design sensibility and deep connection with consumers make her an ideal partner at this pivotal time for Revlon."

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dsm-firmenich Announces Launch of Fragrance Innovation, emotion social connection



According to the company's New Next Now Barometer consumer study, 75% of consumers surveyed said they believe happy social relationships are essential.

Image by Eugenio Marongiu at Adobe Stock

dsm-firmenich announced the launch of its latest patent-pending fragrance innovation, emotiOn social connection. This technology is rooted in neuroscientific research and claims to foster human connection and entice consumers towards real-life interactions.

According to the company's New Next Now Barometer consumer study, 75% of consumers surveyed said they believe happy social relationships are essential. However, 52% of Gen Z respondents said they feel isolated, and many described social interactions as stressful and intimidating.

"This is where emotiOn social connection comes in – the first fragrance innovation designed to boost presence and human connections," said Matteo Magnani, executive vice president, growth office. "It blends emotional expertise, data intelligence and behavioral science to create fragrances that help bring us closer to each other, that help us connect with others. The power of scent unlocked, making us more present to enjoy real life interactions."

According to the company's press release, emotiOn social connection was developed using an expensive consumer study focused on decoding the olfactive cues linked to the emotions felt when people interact with each other. Using its proprietary AI model and collaborating with a world-renowned research institute, dsm-firmenich created a behavioral testing methodology to measure human reactions in the context of social interactions. This allowed the company to create fragrance design guidelines that follow the methodology to craft fragrances that foster emotional closeness.

"At dsm-firmenich, we're harnessing the power of scent to foster emotional wellbeing and human connection," said chief science and research officer Sarah Reisinger. "The emotiOn social connection innovation is grounded in decades of neuroscience and behavioral research, and it's a testament to how science can elevate everyday experiences. By decoding the emotional language of fragrance, we're creating scent solutions that help people feel more socially confident and connected."

The emotiOn social connection technology can be applied across various products, including fine fragrance and personal care essentials.

Jungbunzlauer to Acquire Illinois Multipurpose Production Site from IFF



"This acquisition is an important step in delivering on our strategic capacity in North America," said CEO Bruno Tremblay.

On September 2, 2025, ingredient manufacturer Jungbunzlauer announced the signing of an agreement to acquire a multipurpose production site in Thomson, Ill., from International Flavors & Fragrances (IFF). The transaction is expected to close in the fourth quarter of 2025.

"This acquisition is an important step in delivering on our strategic capacity in North America," said Bruno Tremblay, chief executive officer of Jungbunzlauer. "Establishing a U.S. manufacturing footprint allows us to work closer to many of our U.S. customers, better understand their challenges and deliver solutions that truly make a difference."

Jungbunzlauer is a leading producer of high-quality, sustainable ingredients from natural sources and serves several industries, including food and beverage, nutrition, home care and personal care. The company is headquartered in Basel, Switzerland and serves more than 130 countries worldwide.

The full terms of the deal with IFF were not disclosed. Jungbunzlauer's press release states that the asset deal does not include any of IFF's commercial business, production lines or employees.

"Upon closing the transaction, our immediate focus will be on preparing the site for our specific production needs," Tremblay added.

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Image by Maksym at Adobe Stock

Givaudan Announces Succession Plans for CEO, Chairman

On August 27, 2025, Givaudan announced that chief executive officer Gilles Andrier will retire from his position on March 1, 2026, after 20 years of leading the company. Christian Stammkoetter, current president of Asia, Middle East and Africa at Danone and member of Givaudan's executive committee, will succeed Andrier as CEO.

Under Andrier's leadership, Givaudan has seen significant growth and portfolio expansion. From 2004 to 2024, the company grew from 5,900 employees to 16,900 employees and sales nearly tripled. Additionally, Andrier has overseen over 20 strategic acquisitions during his time as chief executive officer.

"It has been an immense privilege and source of joy to lead Givaudan for the last 20 years and be part of its journey for over 30 years," Andrier said. "I love this company, and its purpose. Over the years, I have been incredibly fortunate to work with, and see develop many talented individuals and teams. I've been equally inspired by our clients and am proud to contribute to the success of their brands. As we set out our strategic roadmap for the next five years, it is the right moment to announce the handover to Christian in early 2026, and I wish him every success for the future."

The company's board of directors selected Stammkoetter to succeed Andrier next March. He brings over 25 years of global experience in consumer goods, including personal care, food, beverage and nutrition.

"I am honored and excited to join Givaudan in early 2026 and to lead this iconic company together with the executive committee and the board of directors," Stammkoetter said. "Givaudan's creativity, customer-centricity, unique culture and 250-year heritage in crafting extraordinary scents and tastes inspire me deeply. I am fully aligned to its purpose and look forward to building on Gilles Andrier's outstanding legacy, driving growth and innovation with our talented teams, customers and partners worldwide."



Gilles Andrier has worked at Givaudan for 30 years, 20 of which were as chief executive officer.

In addition to the changes in CEO, Givaudan also announced that chairman of the board Calvin Grieder will step down from his role at the next annual general meeting in March 2026. The board of directors is expected to propose Andrier for election to the role of chairman.

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Courtesy of Givaudan



Natara Global Announces Cash Offer to Acquire Treatt PLC



Company officials hope that this acquisition will help both companies broaden their geographic reaches and give customers a larger portfolio of high-quality ingredients.

On September 8, 2025, ingredient manufacturer Natara Global announced plans for an all-cash acquisition of Treatt plc, a leading manufacturer and supplier of natural extracts and ingredients.

Natara was acquired by European private equity firm Exponent in 2023, which has accelerated Natara's growth through investment in manufacturing and service capabilities and a high-performing leadership team. Company officials hope that this acquisition will help both companies broaden their geographic reaches and give customers a larger portfolio of high-quality ingredients.

"With the support of Exponent, Natara has been investing for growth since 2023," said Natara Global's chief executive officer Yoram Knoop. "By combining with Treatt, we will be strongly positioned to continue our growth journey. The combination of Natara and Treatt will bring together two complementary businesses, expanding our portfolio, accelerating our capability in innovation and delivering an enhanced customer proposition globally. The combination will also create more opportunities for each company's teams, with greater capacity for collaboration and investment in talent."

Full terms of the acquisition were not disclosed in the press release.

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2-Methyl 3-furanthiol performs very well in meat and seafood flavors and also finds a role in other savory and nut profiles.



BY JOHN WRIGHT
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Flavor Bites: 2-Methyl 3-furanthiol

Learn about the diverse range of flavor applications for 2-methyl 3-furanthiol.

In the challenging area of meat flavors, two closely related chemicals, 2-methyl 3-furanthiol and 2-methyl 3-tetrahydrofuranthiol, compete for our attention. 2-methyl 3-tetrahydrofuranthiol is an old favorite of mine, with a profile that fits easily into any heated flavor profile.

Nevertheless 2-methyl 3-furanthiol (FEMA GRAS#3188, CAS#28588-74-, COE#11678, DG SANTE#13.055) is clearly the logical winner. It is easily the best "bang for your buck," being stronger and also less expensive. Both chemicals are predominantly in the "boiled" aroma category, but 2-methyl 3-furanthiol has a more obvious hint of meat. It performs very well in meat and seafood flavors and also finds a role in other savory and nut profiles.

Note that the dose rates given throughout this article are the levels suggested for use in flavors intended to be dosed at 0.05% in ready-to-drink beverages or in a simple bouillon.

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Meat Flavors

Bacon: Levels of 2-methyl 3-furanthiol in bacon flavors depend on the target profile. Twenty five ppm is a good starting point, but higher levels are also effective.

Beef, Roast: The profile of roast beef flavors encourages an unsubtle addition of this powerful ingredient. One hundred ppm is perfect.

Chicken: Most chicken flavors shine with a slightly more cautious addition of 2-methyl 3-furanthiol, around 50 ppm.

Ham: Fifty ppm is also a good level in most ham flavors, but higher levels can be used if needed.

Lamb: The same level of this raw material, 50 ppm, introduces a good cooked meat note to lamb flavors.

Liver: Liver flavors, as a general category, are not exactly subtle, but they do not need a powerful cooked note. Ten ppm of 2-methyl 3-furanthiol is adequate.

Pork: Pork flavors are a very different matter. This raw material fits perfectly into the profile of most pork related flavors, and 100 ppm is just a starting point.

Venison: In many respects venison flavors can be compared with beef flavors, minus the fatty notes. One hundred ppm is ideal.

Seafood Flavors

Crab: 2-Methyl 3-furanthiol is a perfect cooked note for all fish and seafood flavors, just with a somewhat dialed back level compared with meat flavors. Ten ppm is an excellent level for crab flavors.

Lobster: Somewhat higher levels, up to 30 ppm, are effective in lobster flavors, giving a boiled effect without becoming overly meaty.



2-Methyl 3-furanthiol is a perfect cooked note for all fish and seafood flavors.

Seaweed: Even at levels as low as one ppm, 2-methyl 3-furanthiol has a noticeable impact on seaweed flavors.

Shrimp: Twenty ppm is a good level in shrimp flavors, adding an attractive cooked character.

Tuna: This raw material is a great fit in tuna flavors. It evokes the profile of seared tuna steaks perfectly at 10 ppm.

Savory Flavors

Butter, Cooked: Levels of addition of 2-methyl 3-furanthiol in heated butter flavors vary considerably with the effect desired. Ten ppm is probably an upper limit.

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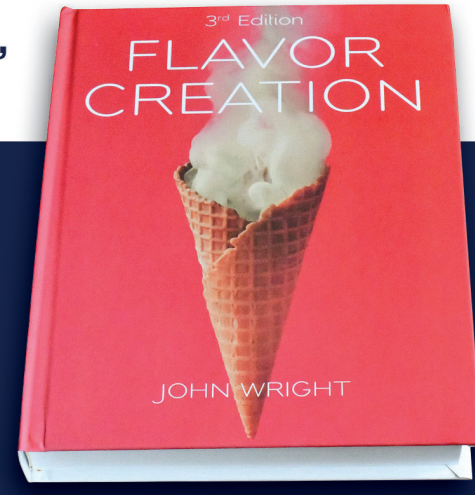


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Pistachio flavors benefit from one ppm of 2-methyl 3-furanthiol.

Cheese, Toasted: Exactly the same comments apply to heated cheese flavors, but the range is broader. One hundred ppm is the upper limit.

Garlic, Fried: Much lower levels work better in fried garlic flavors. There is still a range of possibilities, starting at three ppm.

Mushroom, Cooked: Three ppm is also effective in simply cooked mushroom flavors, moving higher in dairy-based sauces.

Onion, Fried: Fried onion flavors are similar to fried garlic flavors. Levels of addition of 2-methyl 3-furanthiol range from two ppm and up.

Rice, Cooked: Cooked rice flavors are usually subtle. Two ppm of 2-methyl 3-furanthiol works very well.

Sesame: Five ppm of 2-methyl 3-furanthiol enhances the impact and complexity of sesame flavors.

Nut Flavors

Almond: 2-Methyl 3-furanthiol is a very useful modifier of all nut flavors. It works at a subtle, rather than obvious, level and additions reflect this. One ppm is a good place to start in almond flavors.

Hazelnut: Hazelnut flavors are a little less restrained and eight ppm is a better starting level.

Peanut: This also applies to peanut flavors, perhaps at a slightly lower level of addition, around five ppm.

Pistachio: Pistachio flavors have a lot of points in common with almond flavors, including the suggested one ppm level of 2-methyl 3-furanthiol.

Walnut: Two ppm is more effective in walnut flavors, still very much in the subtle modifier category.

Other Flavors

Bread: Bread flavors vary considerably in character, and it is hard to set a good starting level of addition for 2-methyl 3-furanthiol. Five ppm is a reasonable estimate.

Butterscotch: 2-Methyl 3-furanthiol can be helpful in butterscotch and other similar flavors at levels of addition ranging from 10 to 30 ppm.

Chocolate: A similar 10 to 30 ppm range works well in chocolate flavors, with milk chocolate profiles shifting towards the higher end of the range.

Coconut, Toasted: Five ppm of 2-methyl 3-furanthiol adds an attractive cooked element to toasted coconut flavors.

Coffee: Two ppm is a good initial level in simple coffee flavors, but higher levels can be better than those, such as cappuccino, involving a dairy element.

Milk, Condensed: This is one flavor category where I would stick firmly to my preference for 2-methyl 3-tetrahydrofuranthiol, but 2-methyl 3-furanthiol works well enough at 20 ppm.

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TOP 10 CULINARY TRENDS SHAPING THE GLOBAL FOOD INDUSTRY

IFF's global culinary team breaks down how these trends can help product developers with innovative and delicious formulations.



Food and beverage product developers are taking inspiration from around the world for their new formulations.

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The savory foods industry is evolving fast, driven by changing lifestyles, shifting health priorities, a quest for familiarity and a hunger for bold flavor experiences. From sauces and cooking aids to mini meals and soups, consumers around the world are looking for products that fit their lives and excite their palates.

We believe that great products should "taste like joy," rooted in local culture, yet inspired by global trends. Here are ten key movements shaping the future of savory foods, and how they can be tailored to deliver delight in every region.

1. Fusion Cuisine: Blurring Borders, Building Flavor Bridges

Fusion is no longer niche; it's a strategic playground for innovation, with 47% of food industry professionals selecting global fusion flavors as the top flavor direction for 2025. Consumers, especially younger generations, are eager to explore new flavors and adventurous taste experiences.

Fusion cuisine offers a sense of adventure and novelty, allowing people to experiment with creative pairings. Travel, social media, and migration have broadened palates and made consumers open to non-authentic "cuisine clashes".

From high-end restaurants to street food cantinas and social media, we observe a range of inventive combinations from *Itameshi* (Italian Japanese fusion) to Korean Tacos to Asian-Cajun (lemongrass, ginger, paprika blends) and more, as well as emerging cuisines, such as West African, Filipino or Caribbean being explored. This trend is relevant for brands and quick service restaurants to launch limited-edition fusion menus.

Moving forward, the challenge to develop successful new products and menus inspired by fusion cuisine is how to spark curiosity while keeping a broad appeal. Flavor storytelling becomes key to building emotional connections with adventurous consumers.



Darrel Fletcher, vice president, global culinary, Taste IFF



Christina Papadam, senior manager, innovation marketing, Culinary, Taste IFF

2. Bold & Spicy: Turning Up the Heat Globally

According to Mintel, 55% of Gen Z consumers in the US are interested in spicy dips, sauces and dressings, while an equal percentage of Indian consumers prefer extra-spicy flavors in traditional snacks. The appetite for hot and spicy flavors is clearly on the rise, with consumers around the world seeking bolder, more adventurous taste experiences.

Younger consumers may be leading the charge, but all age groups are engaged. Spicy foods are seen as both exciting and comforting, offering a physical kick and an emotional lift, while elevating the overall flavor of the dish.

Consumers enjoy experimenting with spice levels, with restaurants and brands offering customizable heat (e.g., spice scales, "hot challenges"). Regional cuisines known for their heat (Sichuan peppers, Korean gochujang, Mexican chipotle and more) are inspiring new product launches globally. Brands highlight specific chili types to communicate intensity and authenticity. Reflecting this growing demand, the global hot sauce market is projected to grow at a CAGR of 10% over the next decade.

Courtesy of IFF

Swicy (fusion of sweet and spicy) seen in products like hot honey, mango habañero and sweet chili sauces have moved from niche to mainstream. This "swicy" trend helps temper heat for wider appeal and enables innovation in snacks, condiments, and mini meals.

Localization matters: successful products balance fire with flavor, create scalable heat levels and adapt spice levels and formats to regional preferences.

3. Smoked & Grilled Flavors: Fire-Crafted Authenticity

Smoky, roasted and flame-grilled flavors are no longer confined to street corners or back yards, they're blazing in supermarket aisles through snacks, sauces, meats and ready meals. According to Mintel, smoke, roasted and grilled flavor profiles are among top 10 flavor descriptors in new launches. In fact, 46% of consumers in the US alone are interested in smoky flavors (e.g., hickory, Applewood) for bacon, hot dog, and sausage product innovations, making it the most popular flavor innovation in this segment. Inspired by global street food rituals from around the world (think yakitori stalls in Tokyo or South American asado pits), these fire-crafted notes deliver layered depth and primal satisfaction.

Consumers crave the emotional warmth of open-fire cooking: it's nostalgic, social and deliciously familiar. Innovation continues through signature smoky characters (chicory, applewood), multi-layered taste of smoky, sweet and salty notes, unexpected combinations (roasted pineapple chili) and global barbecue inspirations, However, regulatory shifts in Europe may drive further evolution in how these flavors are delivered.

4. Multisensorial Exploration: Eating with All Senses

Texture, aroma, and visual drama are becoming central to product design. Multisensorial exploration is thriving thanks to social media, which amplifies visually and experientially engaging foods, with 40% of consumers in Thailand agreeing that multisensory food and drink can boost their mood (Mintel). This trend is driving innovation, emotional connection, and inclusivity in food, as brands and consumers alike seek out and share memorable, multi-sensory eating experiences online.

Think crunchy toppings on creamy soups or pot noodles, sizzling sauces, foam, and color-changing cooking aids. Developers are innovating with layered textures, interactive packaging, and aroma enhancing formats to elevate everyday meals and thrive in social media.

5. Comfort Food Reinvented: Nostalgia with a Twist

Comfort food remains a powerful and enduring trend globally, especially in times of uncertainty and crisis. Consumers increasingly look to food and drink for emotional reassurance, nostalgia, and moments of joy.

Despite the rise of global influences and new culinary experiences, consumers consistently gravitate toward familiar flavors that remind them of their childhood or cultural heritage. Globally, there's a revival of childhood favorites (mac & cheese, meatballs, noodle soups) reimagined with premium ingredients, ethnic spices or plant-based swaps.

For instance, 65% of UK consumers enjoy products that remind them of their past, 51% of Brazilians favor childhood flavors and 70% of Spanish consumers prefer eating the same chocolate products they enjoyed as children. This trend offers



There is a growing demand among consumers for familiar childhood flavors, such as mac and cheese, with an elevated twist.

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Price sensitivity is at an all-time high, and consumers across markets are prioritizing value for money.

emotional resonance while allowing for innovation in format and flavor. For example: how would you reinvent the classic chicken soup?

6. Convenience & Versatility: Smart Solutions for Busy Lives

Modern consumers are juggling work, family and social commitments, leaving less time for meal preparation. As a result, they seek products that save time and effort, such as ready meals, cooking aids and foods compatible with kitchen appliances like microwaves and air fryers.

Consumers want to maintain the quality of home-cooked meals while reducing the time spent in the kitchen. This drives the opportunity for premiumization, as consumers are willing to pay for products that offer elevated convenience without sacrificing taste or nutrition.

Consumers value products that are adaptable and versatile, able to serve multiple meal occasions, dietary needs or cooking methods. Versatile sauces that can also act as cooking aids allow for creativity and customization, helping home-cooks master their kitchen routines.

7. Mindful Eating: New Health & Wellbeing

With the rise of GLP-1 medications, brands are adapting to evolving consumer needs — embracing smaller portions, higher protein content and shifting taste preferences, including reduced tolerance for fatty or spicy notes.

IFF continues to conduct culinary research across North America to better understand how GLP-1 usage is influencing flavor perception and dietary behavior.

- **Added:** Fortified with extra nutrients (e.g., vitamins, minerals, fiber, protein).
- **Optimized:** Enhanced for better nutritional profiles (e.g., lower sugar, fat, or salt).
- **Multi-benefit:** Delivering several health benefits in one product (e.g., supporting immunity, digestive health, and energy simultaneously).

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Consumers increasingly expect food and beverages to do more than just satisfy hunger, to contribute to their holistic wellbeing without any compromise on taste.

8. Trust & Transparency

Consumers are increasingly focused on health and nutrition, seeking food and drinks perceived as safer and better for their wellbeing. They associate "natural" and "clean label" products (products with simple, recognizable ingredients and minimal processing) with positive health outcomes.

According to Mintel, over a third of US consumers say claims like "free from artificial flavorings" influence their purchasing decisions. Shoppers want transparency and trust; at least 58% of global consumers value honesty and transparency in food products. Clear labelling and communication then becomes increasingly important as the ultra-processed food regulation is being discussed.

9. Affordability & Private Labels: Value-Driven Innovation

Economic pressures are reshaping purchasing behavior, with frugality emerging as a key driver. Price sensitivity is at an all-time high, and consumers across markets are prioritizing value for money.

Private labels are gaining ground by offering quality at accessible prices, often paired with bold innovation. In Germany, 87% of grocery shoppers compare prices between own-label and branded products, and 60% would choose private label if it's cheaper.

Globally, we are seeing "premiumization within budget", e.g., gourmet-style ready meals or globally inspired sauces under store brands. Developers must balance cost-efficiency with great taste and nutritional expectations, while facing similar pressures, as ingredient costs climb. In many cases, reformulation is often the smartest path forward.

10. Sustainability & Adaptability: From Constraint to Opportunity

Sustainability is no longer a nice-to-have; it's a strategic imperative driven by customer commitments, regulatory shifts and public targets. At the same time, supply chain volatility (climate disruptions, geopolitical tensions) is reshaping how the industry sources and formulates.

Together, these pressures spark innovation. Brands proactively redesign recipes to lower costs, CO_2 footprints and increase traceability and security of supply to minimize disruptions. Flavors that are designed mindfully and backed by strong sustainability commitments will be successful in capturing the value presented by this trend.

References

1. Industry Insights: 2025 Flavors and Formulations - Food Industry Executive, *https://foodindustryexecutive.com/2024/12/industry-insights-2025-flavors-and-formulations/*
2. Mintel, Flavor Innovation on the Menu, US, 2025& Table Sauces, India, 2024, *https://www.mintel.com/press-centre/future-of-flavour-innovation-2025/*
3. Mintel, Bringing Back the Good Old Days: How Nostalgia Marketing Can Help Your Brand Succeed, 2025, *https://www.mintel.com/insights/food-and-drink/bringing-back-the-good-old-days-how-nostalgia-marketing-can-help-your-brand-succeed*
4. Mintel, Germany Attitudes towards Private Label Food and Drink Consumer Report, 2025, *https://store.mintel.com/report/germany-attitudes-towards-private-label-food-drink-market-report*
5. Food Ingredients First, Global clean label market trends, 2025, *https://www.foodingredientsfirst.com/news/global-clean-label-trends-consumer-preferences-2025.html*

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Back to the Bun: **Authenticity is Key in Savory, Blended Proteins**

As consumers continue their flexitarian diets, product formulators have a significant opportunity to deliver hybrid proteins in the market.

BY KEN KRAUT, vice president, global savory flavor creation and chief flavorist, ADM



Ken Kraut, vice president, global savory flavor creation and chief flavorist, ADM



Delivering an extraordinary flavor experience requires a multifaceted approach and a keen understanding of food science.

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A decade after the plant-based burger boom of the mid-2010s, flavorists and food scientists are returning to the bun as a source of inspiration. They're expanding their focus from straightforward alt-meat mimicry to now include more protein content and protein diversity than ever before. This subtle shift may help address the needs of nearly 70% of global consumers seeking different protein sources to ensure nutritional variety and balance[1]. The latest development is plant-plus-meat blends (or "hybrids") combining plant-based ingredients with traditional animal proteins in familiar applications like patties, tenders and sausages.

These blended proteins can help consumers explore protein diversity without dramatically changing their dietary habits – and many are already open to the idea. Globally, 68% of consumers are interested in trying blended or hybrid foods and beverages[1]. The top-ranked blended meat categories consumers gravitate toward are chicken, beef, pork and seafood[2]. However, for blended protein products to really take off with consumers, meat flavor profiles need to be equivalent – or better – than expected. This is where savory flavors and solutions come into play.



Blends celebrate the inclusion of plant-based ingredients, proudly proclaiming their nutrition and protein diversity.

Creating Multi-Sensorial Experiences

As consumers continue to enjoy flexitarian lifestyles, whether they're actively trying to eat more plant-based foods or are taking a more carefree and curious approach, there is significant opportunity to bring blended protein products to market. Authenticity is key to success – consumers desire the same taste and sensory experience they would get from conventional proteins. Moreover, consumer expectations of blended formats are even higher when the meat alternative product is more readily available, like nuggets, hot dogs and burgers, whereas they might be less critical when comparing emerging formats like seafood alternatives.

With every blended protein patty, fillet and cutlet, brands are challenged to recreate the flavors, aromas, bite and chew that will elevate a finished product to rival its traditional counterpart, the "gold standard." Delivering an extraordinary flavor experience requires a multidimensional culinary approach and a keen understanding of food science. Flavorists employ reaction chemistry along with a strong command of key materials to replicate the taste and aroma of "true to kitchen" flavor profiles.

For example, the hallmarks of a hamburger are the fattiness, the juiciness, the salty, umami and meaty notes. In a blended protein burger, the foundation lies in replicating savory umami flavor and lubricity in mouthfeel. Culinary techniques and ingredients add complexity, including the grilled meat notes and aromatic top notes of onion and garlic.

Another critical step is to evaluate the base proteins to determine if there are any off-notes, dryness or texture differences in the formulation that need to be adjusted to match the gold standard. Working with blended proteins (including plant- and animal-derived proteins) has the advantage of animal fat and/or protein already in the mix, providing formulators with a clearer target for how the added plant-based proteins should perform. Flavor modulation and masking technology help eliminate off-notes, improve mouthfeel and amplify umami flavor. Ultimately, formulation is a balancing act: enhancing the best aspects of each protein while minimizing any undesirable elements. Notably, consumers prefer a higher meat-to-plant ratio in blends, with the optimal balance around 60/40[2].

Clean Ingredient Considerations

Blends celebrate the inclusion of plant-based ingredients, proudly proclaiming their nutrition and protein diversity. This is a win for the 66% of global consumers who say they're looking to increase their protein intake[1].

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Another twist on the traditional is plant-forward crab Rangoon, crafted to deliver authentic taste and texture and paired with vibrant sweet chili sauce.

However, when shoppers are scanning nutrition and ingredient labels, they're also checking for better-for-you and "clean label" cues like low sodium, recognizable ingredients, high fiber, "closer to nature" ingredients, less fat and fewer calories.

Developing a successful blended protein product takes a two-pronged approach. First and foremost, keep the formulation simple, focusing on the ingredients that will support the desired texture. Secondly, it's important for product developers to understand the key attributes of a specific category or format. A formulation differs depending on the base format, the intended claims and the regulatory framework surrounding the finished product.

Consider a ready-to-eat breakfast patty. Starting with clean tasting, highly functional pea protein, product developers will also benefit from pea's neutral color and no mandatory allergen labeling requirements. Salt modulation technology, which potentially could be labeled as a natural flavor, helps rebalance the taste profile of a lower sodium patty while also masking any off-notes from the high protein content. Pork-type flavor and a bespoke breakfast sausage seasoning round out this feel-good option, which can be customized to meet K-12 child nutrition crediting guidelines or support adult wellness needs.

Soy is also an excellent option for plant-based formulation – either as a standalone protein source or for blended protein products. It's one of the few non-animal proteins that contain all nine essential amino acids necessary for human nutrition, with a Protein Digestibility-Corrected Amino Acid Score (PDCAAS) of 1. Plus, soy's wide-ranging functionality across applications keeps it in formulators' top spot for plant proteins within global alternative protein product launches. Breaded chicken nuggets with the addition of high-quality soy protein, navy bean grits and white quinoa – two good sources of dietary fiber – create a tasty, balanced and satisfying meal for children and their parents.

Emerging Formats and Global Influences

While authenticity is essential to the tastes and textures of blended proteins, consumers are open to new formats and sensory experiences. In the U.S., consumers who are most engaged with plant-based meat alternatives are seeking products that deliver "dynamic sensory experiences" while incorporating bold, global flavors, and meat and flavor cues such as juicy, succulent and spicy[3].

Delis, meat markets and foodservice continue to innovate with culinary-forward, premium recipes that

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advance blended proteins toward mainstream appeal. Imagine boneless soy-plus-chicken wings seasoned with an aromatic, East African-berbere spice blend and baked until crispy, bringing a perfect balance of spicy, smoky, slightly sweet and complex heat to a classic favorite. Another twist on the traditional is plant-forward crab Rangoon, crafted to deliver authentic taste and texture and paired with vibrant sweet chili sauce.

Interestingly, certain meat formats from various geographies and cultural traditions already lend well to the inclusion of plant proteins and ingredients, like sausage, gyros, doner kebab, shawarma, as well as the rise of Levantine and other Middle Eastern cuisines. These types of products are often and even traditionally made with plant-based inclusions, such as beans, pulses, grains, seeds and vegetables. For instance, gyro meat can contain up to 12% soy protein and maintain a standard of identity regulated by the USDA. Meatballs also have up to 12% permissible level of inclusion for plant protein. Such products could provide a transitional opportunity to help consumers successfully bridge the gap to more exploratory tastes.

The Best of Both Worlds

Today's consumers are seeking optimized nutrition and outstanding sensorial experiences – without the expectation of significantly changing their lifestyles. Advances in ingredient diversity and quality, formulation expertise and next-generation technologies have enabled the merging of plant-plus-animal protein sources that leverage the best of both.

This new era of protein blends meets every rising consumer demand – protein and ingredient diversity, higher protein content and nutrient-density, elevated taste and texture – and they can do so better than current 100% meat or 100% plant-based selections in the marketplace.

Although this might seem like an opportunity for premium positioning, promoting holistic value is important to today's consumers. Given their novelty in the market, products made with protein blends should be priced to encourage trial (just like the approach for any new product launch in the food and beverage space). Positive experiences will inspire repeat purchases.

Finding a partner with the expertise and experience in both alternative proteins and savory flavor solutions, guided by consumer and market insights, can help brands create blended proteins that deliver authentic culinary flavor experiences.

References

1. ADM Outside Voice™, Global Lifestyle Survey, 2025
2. ADM Outside Voice™, The Future of Blends, Global Consumer Insights Report, 2024
3. ADM Outside Voice™, Savory Flavors: Insights and Solutions for Authentic-Tasting Alternative Proteins, 2024

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Targeted TSCA Changes Would Improve Innovation, Inspire New Chemistries

ACI's director of government affairs outlines how improvements in the Toxic Substances Control Act would promote innovation in the cleaning industry and keep the US market competitive.



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The Toxic Substances Control Act defines how new and existing chemicals are regulated by the United States.

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BY BLAKE NANNEY, director, government affairs, American Cleaning Institute

There is growing interest among the 119 th Congress in proposing changes to the Toxic Substances Control Act (TSCA). We at the American Cleaning Institute are happy to see this topic on the docket, knowing that targeted changes to TSCA could have huge implications and drastically improve the production and approval of new chemistries for not only our members, but fragrance formulators and ingredient manufacturers across the industry.

With proposed changes in the works, it's important to understand the full context of how we got to where we are today.

TSCA defines how new and existing chemicals are regulated by the United States. The Environmental Protection Agency (EPA) has jurisdiction over implementing the TSCA law by overseeing the chemical management process for both new and existing chemicals. For example, if fragrance and ingredient manufacturers seek to introduce new chemistries to the U.S. marketplace, they must submit a Pre-Manufacture Notice (PMN) to the EPA. The EPA must then conduct a review to determine if the manufacturer can use the new chemistry in products for U.S. consumers.

According to the TSCA statute, which was amended by the Frank L. Lautenberg Chemical Safety Act for the 21 st Century Act and signed into law by President Barack Obama in 2017, EPA must review and decide on a PMN submission within 90 to 180 days. And while the bill was successfully signed into law with bipartisan support, the implementation has encountered challenges. Manufacturers, including those in the fragrance and ingredient manufacturing space, have experienced significant delays in EPA's ability to process PMN reviews within the statutory timeline, leading to a backlog of pending new chemical reviews.

The result is a bottleneck in innovation for new chemistries. This hinders advancements in public safety and environmental protection for new chemistry innovations that could replace existing chemicals by using improved manufacturing and processing techniques that reduce risk, exposure and energy use. In some past cases, the EPA has imposed overly conservative assumptions and data requirements that actively hamper the speed at which industry can release new safe and innovative products.



Blake Nanney, director, government affairs, American Cleaning Institute

Courtesy of American Cleaning Institute

Additionally, many new chemical PMN determinations have been regulated via Significant New Use Rules (SNURs), which often prohibit usage by downstream manufacturers with complex supply chains. This particularly hurts cleaning product manufacturers, as they are often prohibited from utilizing new chemistries in their products that could otherwise replace older, legacy chemicals.

On the upside, earlier this year, EPA leadership announced that it would prioritize resources to address the backlog of new chemical reviews – a positive development that ACI supports. We commend the EPA for prioritizing new chemicals. However, more is needed on the legislative side to result in positive changes that will last into the future.

That brings us back to the recent push in both the House Energy& Commerce Committee and the Senate Environment and Public Works Committee, which have voiced interest in the problems identified with the TSCA statute and the law's implementation. We were happy to see the House Energy and Commerce Committee begin this legislative session with the Committee's first hearing of the year focused on the issue, which followed an oversight hearing in January 2024 by the Senate Environment and Public Works Committee.

As Congress considers ways to improve TSCA, ACI is advocating for a targeted legislative amendment that improves the EPA's ability to process PMN reviews consistently and predictably. This would improve ingredient suppliers and fragrance formulators' ability to innovate and introduce new chemistries and products



ACI supports a risk-based regulatory approach to TSCA modernization that is practical, timely and firmly grounded in sound science.

to American consumers. It will help keep the American market competitive, especially because many other countries have had chemistries reviewed and approved for market entry for specific new chemicals, while they haven't within the U.S., resulting in fewer choices and benefits for our domestic consumers.

We also view this challenge as a detriment to investments in U.S.-based research and development. As we all know, businesses like predictability. And when other chemical management programs around the world are more efficient and consistent in their reviews – where a manufacturer can predictably expect a determination in a reasonable timeframe – that weighs on corporate decision makers when they think about where to invest research and development funding for new chemical advancements. Since we haven't had a working new chemicals program in the U.S. for some years now, businesses have taken notice.

That's why ACI supports a risk-based regulatory approach to TSCA modernization that is practical, timely and firmly grounded in sound science. This approach ensures that member companies and those across the industry spectrum can innovate and formulate.

ACI will continue to advocate for the changes necessary to improve the chemical management process managed by the EPA. We are not calling for a wholesale rewrite of the TSCA statute; we support targeted, meaningful changes that can truly deliver more innovation on the scale Americans expect and deserve. We've made this case directly to Congress in recent years; through countless individual meetings on Capitol Hill, as well as multiple Capitol Hill fly-ins, facilitating direct engagement so our member companies can speak directly with legislators about issues impacting their organizations. We recently partnered with the members and staff from the Congressional Chemistry Caucus to host a reception focused on *Innovative Chemistries for a Cleaner America*, highlighting the importance of chemicals across the economy.

We're committed to this. And as negotiations continue among the members of both the House and Senate, we will continue to press Congress to make the necessary changes to instill more predictability and efficiency in the TSCA chemical management process. ACI continues to be a leader on this issue, as we know innovation is critical for industry growth, economic competitiveness, and better choices for American consumers and families.

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The Rise of Prestige Fragrance in Laundry Care:
Q&A with Laundry Sauce COO



Robert Cardiff

Consumers are shifting their preferences towards laundry products with high-quality, sophisticated fragrances.

Robert Cardiff explains how fragrance can make a mundane task like laundry more elevated.

Laundry care is no longer a one-note category. Prestige and affordable brands alike are enhancing their fabric care offerings by including high-quality fragrances. In fact, there has been a 29% growth in laundry launches with fantasy fragrances over the past five years, according to Innova Market Insights[1]. Further, Innova's research shows that there has been a 16% increase in laundry launches with microcapsules, which can help maintain fragrance claims[2].

Laundry Sauce, launched in 2022, combines its high-performance fabric care formulas with high-end fragrances from top perfumers. With scents such as Australian Sandalwood, French Saffron and Mojave peach, the brand aims to elevate the laundry care experience and give consumers a high-performing, good-smelling load of laundry. Further, the brand uses green chemistry principles to minimize hazardous substances in its products and reduce environmental impact.

Robert Cardiff, co-founder and chief operating officer of Laundry Sauce, spoke with Perfumer& Flavorist+ about the role fragrance plays in fabric care and the ways he predicts this category will continue to evolve.

What role does fragrance play in laundry care?

Fragrance is a deeply personal experience, from your perfume to the hand soap you choose for your home. Everyone has to do laundry, so we wanted to make a collection of scents that transform a mundane moment into a ritual, with premium scents that stay with you all day. We took inspiration from Steve Jobs, who believed that the blend of technology and art is crucial for innovation and creating products that truly resonated with people. By infusing our collection with sophisticated scents, it creates the opportunity to express yourself through something as simple as the laundry detergent you use,



Laundry Sauce launched its Mojave Peach scent in summer 2025.

Courtesy of Laundry Sauce

and enhances everyday moments into something personal and memorable.

What are the current trends in fragrance within the laundry product market?

In the same way that niche fragrance is trending in perfume, consumers are looking for more unique, intentional fragrances for their laundry. Fine fragrance has worked its way into almost all home categories, so people don't just want higher-end options, they expect them, and will seek them out. That's why we partner with the world's top perfumers to create a collection of signature scents that are unlike anything on the market.

How have consumer preferences for scent profiles in laundry products changed recently? Are people leaning towards stronger or more subtle fragrances?

Consumers want bold, *sophisticated* scents that last. If people are investing in a detergent with high-end fragrance, it's not enough for it to smell good in the pod or in the bottle. They want a scent that's bold but not overpowering, that's perfectly balanced and lasts long after laundry day.

Because of this, we're seeing the rise of scent boosters to give laundry an extra burst of fragrance to every wash, so customers really feel (and smell) like they're getting their money's worth. Scent Boosters also provide the element of customization that people are hungry for. One person in the household might want a touch of scent while the other might want a bolder projection. With a scent booster, you can control just how much fragrance you get.

Are you noticing any specific seasonal or cultural influences in fragrance preferences?

We do tend to see purchasing patterns follow seasonality seen in fragrance: warm, woody, spicy scents in the winter and bright, juicy scents in the summer. But, since fragrance is so personal, we have many customers who stick to their signature scent year round.

What's the connection between emotional well-being and the fragrances used in laundry products?

Fragrance in any product can enhance your day and make every moment more enjoyable. When you infuse your clothing with fine fragrance from a detergent, it is a continuous, unexpected burst of joy that won't wear down and fade away. Perfume or body care can fade throughout the day, but a fabric-designed fragrance infused into your clothing will last until your next laundry day.

How important are clean, sustainable, and natural ingredients when it comes to fragrances in laundry products?

All of these factors are important when crafting products, which is why all of our fragrances are masterfully blended with essential oils and responsibly sourced ingredients, and our products are eco-conscious and thoughtfully made. When it comes to fragrance and sustainability, there are some notes that are too rare and endangered to be naturally sourced, which is why we use a blend of naturals and safe synthetics to bring you the most high-quality fragrance blend that is as good for the earth as it is for your nose.

Are there any advancements in fragrance technology that contribute to making laundry products more eco-friendly?

The most notable recent innovation in laundry fragrance technology is micro-capsules with biodegradable walls. Previously, capsules were made with plastic, which is not very sustainable. Now, the industry has innovated biodegradable capsules that don't shed microplastics into the water. They perform a bit differently than traditional capsules, but consumers seem to like them just as much.

We at Laundry Sauce have not started using any sort of encapsulation in our formula yet, though we are always innovating to provide the best experience we can.

Are there any niche or surprising scent profiles that have gained traction in recent years?

It's all about personal taste. While our classic profiles like Australian Sandalwood and Italian Bergamot are fan favorites, we see some consumers who are always eager to try our newest fragrance, like our latest scent Mojave Peach, or our other limited-edition scents, Oregon Mint and Spanish Leather. Even French Saffron remains popular, in line with the saffron trend in fragrance. You can't predict what people will respond to, but these have shown us that the risk is always worth the reward when it comes to unique scents.

How do you ensure balance between long-lasting fragrance and skin-friendliness in your products?

Everyone's skin responds to fragrance differently. Fragrance in itself is an irritant, it's just a matter of sensitivity and how reactive one's skin is. That said, our fragrance blends are extremely gentle. We have customers with extremely sensitive skin that tell us that Laundry Sauce is the only scented product that doesn't irritate them. As the experts in laundry and the leaders in fine fragrance, we are working on a new innovation, specifically formulated to bring our signature fragrance to those with sensitive skin. Keep your eyes out this fall…

Looking ahead, what do you see as the biggest opportunities and challenges for fragrance innovation in laundry products?

We look at every challenge as an opportunity to innovate and create the most premium, high-performance products on the market. We are always exploring new products and formulas that elevate your laundry day, not only with incredible scents, but effective performance and care that keeps our community coming back. We have many different products in the works that are unlike anything available today, both in the laundry room and outside of it, so you can look, feel, and smell your best.

Do you have a favorite fragrance in your product range? If so, what makes it special to you?

Choosing a favorite is almost impossible. My personal favorite, at the moment, is Mojave Peach. It's the perfect blend of sweet, juicy, and spicy that I (and many others) can't get enough of. We called it the scent of the summer, but its balance of warmth and sweetness makes it an unexpected go-to for the colder months as well.

Oregon Mint is also a favorite because it has an upscale laundry freshness that I really love. The fragrance smells clean without anything technical or harsh, and the scent has strong staying power with a beautiful, fresh, clean finish.

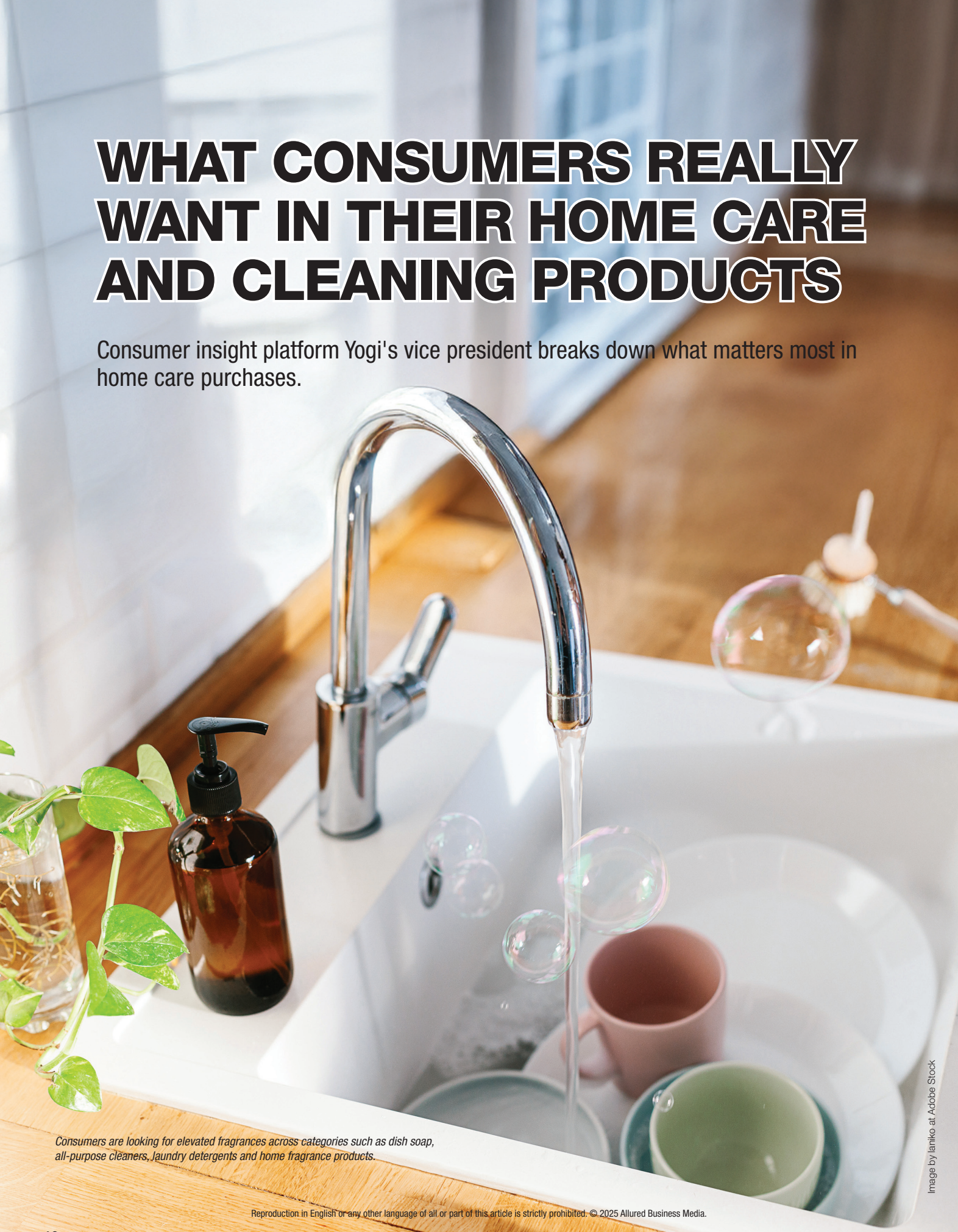
References

1. Top Household Trends 2025, Innova Market Insights, *https://www.innovamarketinsights.com/trends/top-household-trends-2025/*
2. Global Home Care Fragrance Trends, Innova Market Insights, *https://www.personalcareinsights.com/news/global-home-care-fragrance-trends.html*

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WHAT CONSUMERS REALLY WANT IN THEIR HOME CARE AND CLEANING PRODUCTS

Consumer insight platform Yogi's vice president breaks down what matters most in home care purchases.



Consumers are looking for elevated fragrances across categories such as dish soap, all-purpose cleaners, laundry detergents and home fragrance products.

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BY SOGYEL LHUNGAY, vice president, Insights, Yogi

Consumer expectations for home care and cleaning products have shifted dramatically in recent years. Once purchased primarily for functional performance, these products are now evaluated through a multisensory lens where fragrance, emotional resonance and even perceived natural authenticity play a central role in shaping consumer behavior.

Analysis of hundreds of thousands of consumer reviews across categories such as dish soap, all-purpose cleaners, laundry detergents and home fragrance products reveals four dominant cross-cutting trends: biophilic authenticity, sensorial escapism, dynamic fragrance experiences and personalization. Collectively, these preferences highlight a fundamental transformation: consumers increasingly want their home care products to feel authentic, emotionally rewarding, technologically advanced and personally adaptable.

Biophilic Authenticity: A Mainstream Expectation

Consumers are no longer satisfied with generic "fresh" or "clean" scents. Instead, they look for fragrances that feel connected to nature. In dish soap and all-purpose cleaners, advanced plant-based fragrance technologies have gained significant traction. Innovations that mimic compounds emitted by trees and plants create what reviewers describe as a sense of "bringing the outdoors in."

Data shows strong positive sentiment toward products marketed with biophilic authenticity, such as those formulated with plant-derived scent molecules. Citrus-herbal blends like *Yuzu Basil* or *Clementine Zest& Lemongrass* scored far higher with consumers than synthetic florals, which often attracted sharp criticism. One reviewer even described a reformulated floral scent in a mainstream product as "cloying" and "overpowering," underlining the risks when brands move away from authentic-feeling profiles. The lesson for formulators is clear: nature-identical fragrance molecules that balance authenticity with performance are now table stakes.



Sogyel Lhungay, vice president, Insights, Yogi

What was once a niche demand is firmly in the mainstream, and skepticism grows quickly when "natural" claims feel overstated or inauthentic.

Sensorial Escapism: Turning Chores Into Experiences

Another emerging driver is the desire for fragrances that transform mundane cleaning tasks into moments of escapism. Reviews of all-purpose cleaners show particularly strong enthusiasm for novel fragrance profiles such as *Rain Water* or *Tomato Vine,* which consumers describe as "elevating" and even "transportive." Similarly, premium dish soap scents like *Wild Jasmine* and *Yuzu Basil* are praised for their layered complexity that makes dishwashing feel more enjoyable.

In home fragrance categories, the trend is even more pronounced. Neuroscience-informed formulations, such as calming blends of lavender, sage, or chamomile, are explicitly marketed for emotional benefits like stress relief or focus. Consumers confirm this connection, often describing these scents as creating an atmosphere of relaxation or escape.

This points to a growing expectation: fragrance in household products should do more than mask odors or signal cleanliness; it should deliver psychological benefits. For perfumers, this means that the ability of a scent to evoke calm, joy, or inspiration is as important as its capacity to align with a functional cleaning task.

Courtesy of Yogi



In the home fragrance category, consumers tend towards scents that offer an escape from their everyday routine.

Dynamic Experiences: Beyond the First Impression

Static scents are losing ground to fragrance experiences that evolve over time. In home fragrance, this is seen in the popularity of multi-phase products, such as layered candles that release sequential scents as they burn. Consumers describe these as offering "two moods in one jar," highlighting the appeal of transformation and surprise.

Laundry detergents exemplify this trend through encapsulation technologies and scent-boosting beads that prolong fragrance from wash to wear. Consumer reviews consistently praise long-lasting freshness, with some describing scent beads as "a game-changer" for maintaining fragrance days after laundering.

Even in categories like dish soap and all-purpose cleaners, where technological advances are less visible, layered and complex fragrance compositions mimic the multi-phase appeal found elsewhere. The takeaway is that longevity and evolution matter as much as the initial impression. Controlled-release technologies and layered compositions are key tools for delivering this dynamic consumer experience.

Personalization: Giving Consumers Control

As in many other industries, personalization has become a defining consumer expectation in home care. Shoppers increasingly want control over the intensity, duration, and format of fragrance delivery.

Digitally controlled home fragrance diffusers and plug-ins are clear examples of this shift, allowing users to fine-tune scent levels to match mood or occasion. Laundry products show the same trend in a more analog form: dedicated scent boosters empower consumers to adjust fragrance independently of the detergent base. Meanwhile, seasonal and limited-edition cleaners tap into personalization by offering choice and collectability.

Consumers reward these approaches because they provide a sense of co-creation. Instead of passively accepting a single fragrance profile, shoppers can tailor

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their sensory environment, making household tasks more enjoyable and personally meaningful.

Cross-Category Insights and Implications

Though each category expresses these trends differently, the underlying consumer demand is remarkably consistent. Dish soaps and cleaners highlight authenticity and escapism, with plant-based innovations and novel scent profiles transforming cleaning rituals. Laundry detergents emphasize longevity and customization, with encapsulation and boosters reshaping expectations of freshness. Home fragrance products lead the way in technological sophistication, with neuroscience-driven scents, multi-phase formulations, and digital controls redefining personalization.

Across categories, one theme dominates: fragrance has moved from a commoditized function to a central driver of innovation and purchase decisions. For perfumers, flavorists, and formulators, this shift means that fragrance development must now be as strategic as performance formulation or packaging design.

From Function to Experience

Consumers increasingly view household and cleaning products not just as functional necessities, but as opportunities to enhance their emotional and sensory environments. The demand for biophilic authenticity, sensorial escapism, dynamic experiences, and personalization reflects a broader cultural shift: people want their homes to be spaces of well-being, identity, and joy.

For the fragrance industry, this presents both challenges and opportunities. The challenge lies in creating aroma molecules that feel genuinely natural, evolve dynamically, and can be tailored to individual preferences. The opportunity lies in redefining the role of fragrance in everyday life, from something that signals "clean" to something that provides comfort, delight, and a deeper connection to the world around us.

In the end, what consumers really want is not just a product that works, but one that feels right, smells authentic, and makes the everyday extraordinary.



FRAGRANCE INGREDIENTS VERIFIED VIA CARBON-14 ANALYSIS



Jordan Turner



Vivek Mehrotra

Carbon-14 testing allows product developers to authenticate the source of a natural ingredient and meet consumer demand for transparency

BY JORDAN TURNER, Marketing Coordinator, SGS Beta; VIVEK MEHROTRA, CEO, Khattri Aromas LLP

Customers want to know where their fragrance ingredients come from and whether they were ethically sourced and sustainably harvested.

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Fragrance ingredients such as essential oils, extracts, aroma compounds and solvents are included in a variety of products such as fine fragrance, personal care products, cosmetics and household care products. The market value of natural fragrance ingredients is expected to grow to $23.39 billion by 2033, a strong increase from 2024's value of $9.76 billion.[1]

Along with higher consumer demand for natural-sourced ingredients as a result of sustainability concerns comes an increase in customer scrutiny when it comes to ingredient transparency and authenticity. This presents an important challenge for companies who need a solution for supporting label claims and ensuring their ingredients are genuinely natural-sourced and unadulterated.

Natural ingredient testing via carbon-14 analysis stands out in the industry as an accurate third-party tool for verifying bio-based or natural-sourced fragrance ingredients.

Key Concepts in Natural Ingredient Testing

Natural ingredient testing measures the isotope carbon-14, or radiocarbon, via an Accelerator Mass Spectrometer (AMS) instrument. This well-established methodology allows for the authentication of bio-based fragrance ingredients according to international standards ASTM D6866 and ISO 16620-2. Results reveal the percentage of bio-based (natural) carbon versus synthetic (fossil) carbon ingredients in a sample.

A result of 100% bio-based indicates an ingredient is completely natural-sourced while any percentage between 1% and 99% indicates the presence of synthetic petrochemical-derived components. An ingredient that is 0% bio-based is therefore completely synthetic.

This method is highly effective as natural components possess known levels of carbon-14 while synthetics do not contain any.[2] Thus, this method clearly identifies whether an ingredient claiming to be 100% natural has been adulterated.



This method is highly effective as natural components possess known levels of carbon-14 while synthetics do not contain any.

Image by dadakko at Adobe Stock



Natural ingredient testing via carbon-14 analysis is one protocol that can be implemented in response to the developments and challenges the fragrance industry faces.

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Maintaining Ingredient Authentication & Integrity

Determining the bio-based percentage of an ingredient has several benefits when it comes to ensuring ingredient authenticity and supply chain integrity. These benefits include validation of natural content, providing data for quality control of raw materials and identifying adulterated ingredients. Economically-motivated adulteration is the intentional omission, addition or substitution of an ingredient.[3] Motivations for adulteration of botanical raw materials are due to high cost, high demand and limited supply.[4]

Analytical methods such as gas chromatography-mass spectrometry (GC-MS) and isotope ratio mass spectrometry (IRMS) are unable to differentiate between natural and synthetic ingredients due to chemical similarities between the two. However, natural ingredient testing is based on the presence or absence of carbon-14, making it an accurate tool to detect synthetic adulterants.[5]

The Value of Natural Ingredient Testing: Industry Insights

Natural ingredient testing is a valuable third-party tool for validating ingredient integrity, serving several purposes for natural product distributors and manufacturers. The aforementioned consumer shift toward the preference for sustainable products and ingredient transparency prompts industry leaders to develop clean-label fragrances. Additionally, the demand for ingredients that are ethically and sustainably sourced lead ingredient suppliers to seek innovation when it comes to formulation strategies and sourcing practices.

According to Vivek Mehrotra, chief executive officer of Khattri Aromas LLP, carbon-14 testing is beneficial

for ensuring the natural source of fragrance ingredients as fragrance industry trends evolve over time. Essential oils such as patchouli, lavender, rose, menthol, vetiver and citrus oils each pose their own unique challenges including overharvesting, oxidization, vulnerability to adulteration and other issues. Making sure ingredients are of consistent quality while preserving natural integrity is fundamental to the manufacturing and distribution process.

There are several strategies industry professionals can use to keep up with customer preferences and industry trends. These include investing in research, technology and market analysis as well as keeping up with client feedback to ensure efforts to meet consumer needs remain agile and responsive to industry changes.

Customers want to know where their fragrance ingredients come from and whether they were ethically sourced and sustainably harvested. These strategies, paired with reliable third-party analysis like natural ingredient testing, are key to staying ahead of the challenges posed by changing trends within the industry.

Targeting Industry Challenges

As the fragrance industry experiences future developments and innovations, sourcing natural and sustainable fragrance ingredients will not be without its challenges. Climate change affects crop yields and geopolitical instability may make it difficult to source from certain regions. Regulatory developments put pressure on the industry when it comes to sustainability claims and allergen concerns. Increased demand also impacts natural ingredient supply chains, leading to variability in quality and the potential for certain botanicals to become scarce.

These factors contribute to the practice of economically-motivated adulteration of naturally sourced fragrance ingredients. Adulteration is a persistent challenge and concern for industry professionals. As the prices of natural raw materials increase, some ingredient suppliers may engage in unscrupulous practices such as dilution or extension of essential oils with cheaper ingredients or synthetic substitutes. For this reason, the detection and verification of natural sourced ingredients is critical.

Natural ingredient testing via carbon-14 analysis is one protocol that can be implemented in response to the developments and challenges the fragrance industry faces. Mr. Mehrotra says that investing in supplier education, implementing strict vetting procedures, and fostering long-term partnerships based on transparency are also key. Industry-wide collaboration on traceability standards and ethical sourcing certifications can further reinforce supply chain integrity.

Carbon-14 natural ingredient testing is one of the methods that can be used to distinguish between bio-based and synthetic fragrance components. In particular, analyzing essential oils that are labeled as 100% natural has successfully detected synthetic adulteration.[6] Essential oils such as sandalwood, rose, and lavender oils, are particularly susceptible to adulteration in various forms from simple dilution to complex mimicry of natural ingredients with synthetic alternatives. Despite the prevalence of adulteration, natural ingredient testing allows for the identification of inconsistencies early on in their formulation process. With this assurance, companies can confidently present their ingredients as naturally sourced to their customers and reinforce the integrity of their supply chain.

Conclusion

Carbon-14 analysis is a valuable tool that identifies the percentage of natural-sourced versus synthetic content of fragrance ingredients. Established industry professionals count natural ingredient testing among their top strategies to ensure transparency, sustainability, and authenticity of ingredients. In particular, carbon-14 testing is instrumental when it comes to responding to challenges such as sourcing difficulties and defending brand integrity in the face of economically-motivated adulteration.

References

1. Sawal J. Natural Fragrance Market Size, Share, Trend Analysis By 2033 . [Internet]. *Emergen Research*. 2025 Jan. [cited 2025 Jul 21].

2, 6. Gershon H. Authentication of Natural Peppermint Oil . [Internet]. Perfumer & Flavorist. Vol. 44:22-25. 2019 Mar. [cited 2025 Jul 21].

3. U.S. Food and Drug Association. Economically Motivated Adulteration (Food Fraud) . [Internet]. U.S. FDA. 2024 Apr. [cited 2025 Jul 21].

4. Gafner S, Blumenthal M, Foster S, Cardellina JH 2nd, Khan IA, Upton R. Botanical Ingredient Forensics: Detection of Attempts to Deceive Commonly Used Analytical Methods for Authenticating Herbal Dietary and Food Ingredients and Supplements . Journal of Natural Products. Vol.86(2):460-472. 2023 Feb. [cited 2025 Jul 21].

5. SGS Beta. Verifying Natural Products: Is Carbon-14 Analysis Necessary? . [Internet]. SGS Beta. 2018 Apr. [cited 2025 Jul 21].

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