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Natural colors and flavors: When artificial won't do

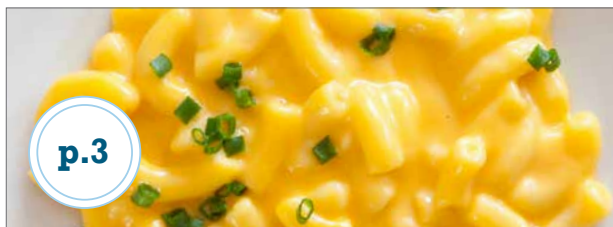
Reviewing the latest in natural colors,
functional flavors and sensory appeal
in trending product categories

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Viewpoint: Colors and flavors pack a powerful punch



Riding the continuing tide of natural color and flavor reformulation

The growing list of food and beverage brands making the artificial-to-natural switch proves that today's clean colors and flavors are approaching performance parity, explains **Kimberly Decker**, contributing editor.



Meeting clean label expectations with natural colors and flavors

Holly McHugh, Imbibe, breaks down how natural colors can impart beautiful hues and health benefits, but heat, light and pH can reduce vibrancy.



Coloring outside the lines: Innovators disrupt the beverage aisle

Growing consumer demand for novelty products and a shift in market dominance of the traditional soft drink giants leaves opportunities in the beverage aisle, says **Tom Vierhile**, Innova Market Insights.



Clean label driving growth in natural colors and flavors

Alex Smolokoff examines how the clean label movement goes hand-in-hand with consumer desires for natural colors and flavors in their food and drink.



Natural: an enticing cosmetic label

FDA has stated all color additives are synthetic, so "natural colors" in cosmetic products must be an inherent color of an ingredient that is not added for coloring, notes **Catherine Bailey** and **John Bailey**, EAS Consulting.



Flavorful compliance considerations

While "natural flavor" is legally defined, brands must also consider the ramifications of a characterizing flavor, advises **Jim Lassiter**, REJIMUS.



Takeaways for your business

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Colors and flavors pack a powerful punch

Artificial just won't do any longer in foods, beverages and

supplements, so formulators must look to natural sources to color and flavor products that are attractive to consumers. Both colors and flavors play an enormous role in the success a finished product; if a product doesn't look or taste good, it won't sell.



But in this new norm of clean label, consumers are demanding products free from artificial flavors and synthetic colors, and brands across the globe are responding by reformulating to meet demand. Case in point: Kraft's Macaroni & Cheese. The brand was able to eliminate its artificial colors and flavors without consumers really noticing a difference. In fact, Kraft announced in April 2015 that it planned to remove all artificial flavors, preservatives and dyes from its Blue Box, and did so by December 2015. By March 2016—just three months later—the brand reported selling more than 50 million boxes of its revamped mac and cheese, which used natural coloring from paprika, annatto and turmeric in place of yellow dyes No. 5 and No. 6. And while the change was listed on the ingredient panel for months, consumers didn't bat an eyelash. In response, Kraft launched a new marketing slogan ("It's changed. But it hasn't.") and a hashtag to match: #didntnotice.

However, simply swapping out yellow dye 5 with annatto or trading in artificial lime flavor for real fruit concentrate isn't easy. In 2016, General Mills announced it was nixing artificial color and flavors from the iconic Trix cereal brand. Consumers hated the reformulated product that paled in comparison to the original. General Mills listened to its fan base, and the original Trix was back on store shelves by 2017.

Brands are making the switch to natural by working with ingredient suppliers that are using the latest technologies to create brilliant hues and incredible flavors that carry a clean label halo. This digital magazine takes a deep dive into the colors and flavors markets to examine market drivers and opportunities, as well as considerations for ingredient selection, formulation and supply chain.

Interested in learning more? I invite you to attend the [Colors & Flavors: Superheroes of Product Success](#) workshop taking place Oct. 17 from 9 to 11 a.m. at [SupplySide West](#) in Las Vegas. The session is underwritten by Cargill, Exberry and Lycored.



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VIRGINIA DARE

Riding the continuing tide of natural color and flavor reformulation

by Kimberly J. Decker

- Making the switch from synthetic to natural ingredients still proves to be a challenge.
- Consumer demand for natural ingredients isn't fading away any time soon.
- However, some consumers have exhibited hesitation toward changing trusted products.

General Mills Inc. did it. Kraft Food Groups Inc. did it. Papa John's Pizza, Campbell Soup Co., Taco Bell, Nestlé, Subway, Panera Bread Co., The Hershey Co., Pizza Hut, Kellogg's Co. and more—they all did it. And maybe it's time you did it, too.

The “it” these companies did was replace the artificial ingredients in their formulations—including artificial colors and flavors—with naturally sourced alternatives.

In so doing, they paid respect not only to the clean label trend still dominating food and beverage development, but to the will of consumers, whose patience with synthesized flavors and FD&C (food, drugs and cosmetics) dyes continues to wane.

But as any of these brands could attest, making the artificial-to-natural switch was no walk in the park. Even at this late date, swapping synthetic colors and flavors for natural options requires attention, communication and a tolerance for repetition—because you'll be making many trips back to the drawing board.

But the growing list of companies completing the conversion—to say nothing of emerging brands that go all-natural from the start—proves that today's clean colors and flavors are approaching performance parity with the “unclean” counterparts they aim to supplant.

Or, as Jason Mittelheuser, technical business development, FONA International Inc., put it, “Virtually anything is possible, but everything has a cost.”

Consumers care

It's hardly news that brands are mounting clean reformulations. A quick peek at [Mintel's Global New Product Database](#) (GNPD) showed 43% of all 2018's food and beverage introductions bore an all-natural claim.

And for good reason: Consumers care. A lot. An [FMCG Gurus survey](#) of 25,000 consumers in 25 countries conducted in the first quarter of 2019 found 73% of respondents hold “100% natural” to be an important quality in food and drink. Sixty-one percent considered such products “healthy,” and 41% viewed them as better for the environment. On the flipside, 59% expressed concern about ingredients they perceive as “chemical.”

73% of respondents hold “100% natural” to be an important quality in food and drink.

61% considered such products “healthy.”

41% viewed them as better for the environment.

59% expressed concern about ingredients they perceive as “chemical.”

Source: FMCG Gurus survey

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These sentiments reflect a broader lean toward health, wellness and mindful eating that encompasses everything from “natural” and “clean” ingredients to organic and non-GMO agriculture, “free-from” diets, sustainability and transparency.

Consider: [SPINS reported in its 2019 State of the Natural Industry Report](#) that organic products accounted for 3% of food and beverage sales—outpacing total market growth—and vegan products are growing at a rate of 10%. Meanwhile, a 2018 report from Label Insight and the [Food Marketing Institute](#) (FMI) found consumers are craving more transparency in food and beverage ingredients, and 75% said they would switch to a brand that provides more in-depth product information beyond what’s provided on the ingredient deck.

As with everything else, we can blame Millennials for putting these issues on the agenda. But even more than Millennials, Generation Z comprises “clean eaters with strong interest in transparency, product sourcing and social responsibility,” said Anu Fisher, marketing analyst, FlavorChem. “They seek foods and beverages that are gluten-free, non-GMO, free of artificial flavors and colors, and contain fewer preservatives.” So, get ready: “Natural” isn’t going away.

Universal truth

In fact, “natural” is gaining broader traction. “Demand for natural ingredients is closer to universal now than in the past,” observed Philip Caputo, marketing and consumer insights manager, Virginia Dare. “Now that the clean label movement has become established, formulators are going natural in categories like snacks and frozen entrées that, 10 years ago, would’ve likely had limited all-natural or clean label options.”

Kid-friendly products still receive scrutiny. “Parents watch their children’s diets very closely,” noted Roger Lane, marketing manager, Sensient Flavors. “So, there’s a specific push to reformulate kid-centric categories such as breakfast cereals, sweet and salty snacks and prepared meals like macaroni and cheese.”

Even supplements are hopping on the wagon, said Paulette Lanzoff, technical director, Synergy Flavors. They may be somewhat late to the game, but “in the past 10 years, there’s been an increasing emphasis on natural for this category, as well.”

Taking a contrarian perspective, Connie Sandusky, global marketing director, DDW, The Color House, wagers that demand will have to strengthen before supplement brands fully embrace natural formulation. “Margins are tight, and competition is fierce in this segment,” she reasoned, “so products can’t support the formulation cost of natural colors.”

Either way, Daniel Castillo, global accounts director at DDW, is bullish on the international prospects for natural ingredients, which “are no longer a

Western luxury,” he said. “Large companies are offering their premium brands all over the world, and globalization opens big opportunities for natural color across a wide variety of segments—not just food and beverage, but also snacks, pet foods and nutraceuticals.”

What’s in a name?

Of course, what qualifies as “natural” isn’t a global matter but depends on how local authorities regulate the term. In the U.S., FDA has left considerable room for interpretation.

“‘Natural’ is inherently controversial,” said Deirdre Burgess, communications manager at FONA. But flavors offer an oasis of clarity as “one of the only areas where FDA regulates the term.”

That regulation resides in 21 Code of Federal Regulations (CFR) 501.22 and defines a natural flavor as—deep breath—“the essential oil, oleoresin, essence or extractive, protein hydrolysate, distillate, or any product of roasting, heating or enzymolysis, which contains the flavoring constituents derived from a spice, fruit or fruit juice, vegetable or vegetable juice, edible yeast, herb, bark, bud, root, leaf or similar plant material, meat, seafood, poultry, eggs, dairy products or fermentation products thereof, whose significant function in food is flavoring rather than nutritional.”



Flavors comprise both a taste component from, say, carbohydrates and acids, and aromas “created by micro quantities of volatile molecules that form in food during ripening, post-harvest changes and processing,” Lanzoff explained. So, in an apple, sugars and acids contribute sweet and sour tastes, while trace amounts of native volatiles add a characteristic “apple” overlay.

“A natural flavor that tastes like apple,” she continued, “will have some components from the apple—juice, essence, pulp—plus other components present in apples but derived from other sources.” Ethyl acetate is one, formed when the fermentation products ethyl alcohol and acetic acid combine. Cis-3-hexenol, also known as leaf alcohol, is another. “It imparts a characteristic green note to apple,” Lanzoff said, yet can be isolated from mint oil. So even a “natural” apple flavor may not be entirely derived from apples.



As for “natural” colors, the CFR classifies color additives into one of two groups: those subject to batch certification—so-called certified colors, which bear FD&C numbers—and colors exempt from certification.

It’s the latter category that are typically sourced from plants, animals or minerals and, thus, typically deemed “natural” by consumers and industry. “However, because FDA considers all color additives used to impart color to food to be artificial colorants, even these exempt colors cannot be labeled as natural,” noted Sue Ann McAvoy, global regulatory specialist, Sensient Food Colors.

In other words, if a brand adds a colorant—even a naturally derived one—to a formulation where it wouldn’t have occurred naturally, it can’t declare it natural on the label.

Balancing acts

As if the regulatory gymnastics weren’t enough, the task of reformulating products to contain natural colors and flavors—however defined—remains a test of patience and fortitude, too.

“In most cases, the taste, texture and aroma of artificial ingredients will be drastically different from those of their natural counterparts,” Caputo said.

The catch: Product developers “want no discernable difference in the flavor or color of the reformulated product,” Lane said. In fact, “many times, they’re looking to swap out both the artificial flavor and color at the same time. This can be a very delicate balancing act and is very application-specific.”



“Natural pigments weren’t ‘designed’ for food and beverage use by the native plants.”

— Lori Napier, director of product development and applications, natural colors division, Chr. Hansen Inc

Yet, as Christopher Warsow, director of culinary applications and corporate executive chef, Bell Flavors & Fragrances, pointed out, “The pallet of ingredients dwindles as label requirements go up. It’s a savvy formulator who can work with that limited pallet and still hit cost and flavor targets.”

Synthetic strengths

All of that helps explain why synthetic flavors and colors became so popular in the first place.

“Synthetic colors are chemically produced, and were designed for shade and stability,” noted Lori Napier, director of product development and applications, natural colors division, Chr. Hansen Inc. “Natural pigments weren’t ‘designed’ for food and beverage use by the native plants. The molecules are naturally susceptible to various conditions [such as heat, pH and light] found in food and beverage formulas and processing.”

Anthocyanins, for example, change hue—what’s known as a bathochromatic shift—when the surrounding pH changes. And while turmeric can produce attractive, bright-yellow shades across applications, it fades upon light exposure.

Because formulation constraints typically limit the inclusion of artificial preservatives, natural flavors’ shelf lives are “less robust, likely on the order of six months, or half that of synthetics,” said Joan Harvey, a researcher at Bell.

Venture into organics, and the constraints multiply further. “Restrictions on solvents and stabilizing components like antioxidants all affect stability,” said Terry Miesle, a senior flavorist at FONA. “Organic sometimes means you just can’t use all the carriers you might otherwise.”

Sticker shock

Not only do natural colors and flavors have a finicky reputation, they’ve also historically cost more despite it. Chalk it up to sourcing and extraction costs, which can be a barrier to naturals’ use in low-cost items. As Miesle put it, “When you have a lower price point on the shelf and want to reformulate to natural, it can cause sticker shock.”

By contrast, synthetics are cheaper to produce, and deliver more color and flavor—effectively doubling their affordability. “Think about ethyl vanillin versus vanillin,” Mittelheuser explained. “It’s not just that ethyl vanillin is an artificial form; it’s more potent, too, so you can use less of it in your flavor, which means a lower use level. That means lower cost in use.”

Know the base

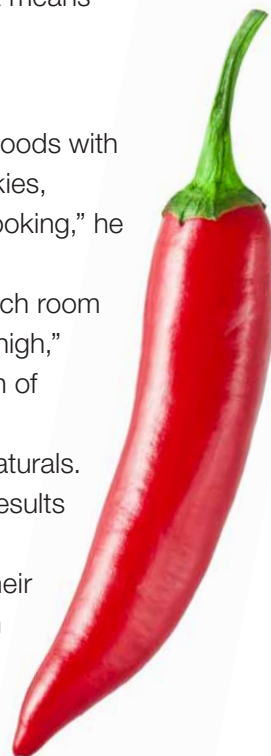
Formulators also need be aware of processing and matrix considerations. “Foods with long or harsh cooking processes are the most difficult,” Warsow said. Meat jerkies, retorted products and fried foods are all cases “where flavors get lost during cooking,” he added. Light aromas like cilantro and fresh chile peppers also suffer.

Even baking can do a number on natural colors and flavors. “There’s not much room to deviate from the formulation’s specs, and the standards for consistency are high,” Caputo said. “A slight change in pH or water content can throw off an entire run of breads or snack cakes.”

And experts advise formulators to know their base before formulating with naturals. “Sometimes, a flavor designed for one product will fail to deliver the expected results in another,” Miesle cautioned.

For example, starch’s structure tends to bind delicate flavors, hampering their volatilization during consumption. “Fat can also bind flavors and prevent them from being sensed,” Warsow added. For that reason, baked crackers present a trifecta of threats: “They’re baked at high temperatures for an extended time and contain a great deal of starch.”

Dried seasonings and snack coatings challenge natural colors because their greater surface area increases the likelihood of oxidation. “Stability improvements are necessary to achieve a desired shelf life,” said Ashley Huff, associate scientist, Kalsec. “There are also hues such as red that’re difficult to achieve in dry form or in coatings for applications like snacks because of factors like heat processing, application method and fat content.”



Exceeding expectations

It's a lot for developers to heap onto their plates, but the caveats wouldn't be so concerning if consumers cut natural products some slack. But no such luck.

To wit, fully 48% of respondents to FMCG Gurus' survey expressed concern when a food or drink looks less vibrant because of its natural colors. And just over half—51%—don't take kindly to paying more for natural. "Irrespective of any health concerns consumers may have, sensory appeal and affordability remain key issues when buying food and drink," said Mike Hughes, head of research and insight at FMCG Gurus.

Fortunately, it's by no means inevitable that naturally colored and flavored products will be inferior to those made with synthetics. In fact, Meghan Fox, marketing specialist at Sensient Food Colors, likened such comparisons to "defamation."

"Natural colors give developers the ability to maximize performance and shade selection," she said. "If your crayon box is more robust and full, you have greater shade options and more effective ways of optimizing natural color performance."

Huff agreed. Earlier generations of colors may have been lacking, but the latest innovations have yielded "naturally based colors standardized to higher pigment content and have increased stability without adding flavor," she said.



"Irrespective of any health concerns consumers may have, sensory appeal and affordability remain key issues when buying food and drink."

— Mike Hughes, head of research and insight at FMCG Gurus

Joshua Jackson, application technologist at Sensient Flavors, said the inferiority of natural flavors is also a common misconception. "They're typically made with the same combination of aroma compounds," he noted, and "both natural and artificial aroma compounds provide the same flavor impacts and profiles when used in formulation."

From source to solution

Those impacts and profiles are improving by the season as suppliers invest in new flavor and color technologies and sourcing strategies.

"Past challenges in developing natural flavors have diminished thanks to the ever-increasing availability of natural materials for use in flavor creation," noted Michael Crane, senior flavor chemist, Comax Flavors. "The continually increasing availability of novel flavor ingredients will allow flavor chemists to develop more complex, 'true-to-nature' profiles."

By leveraging fermentation, better extraction techniques, reaction flavor development and new methods of harvesting flavor components from plant sources, "flavor suppliers

are bringing new ingredients to market every year,” added Michael Levine, director, strategy and product management, flavors, Glanbia Nutritionals. “As techniques improve, costs generally come down, too.”

Looking at colors, Andy Dratt, chief commercial officer, Imbibe, reflected on how the move away from synthetics has changed the nature of the industry itself. “Because synthetics were products of a chemical process, the trick was building facilities to make them,” he said. “When you go natural, you’re bringing in an agricultural element that you didn’t have before. You don’t just have to know how to process these colors; certain pigments may mean breeding certain crops in different ways. And that’s a very different business.”

Dave Gebhardt, technical director at Sensient Food Colors, pointed to the success of his company’s seed-to-shelf agronomy program in naturally breeding botanical seeds for proprietary colors with higher pigment concentrations. “This enables better cost in use for developers and makes natural colors more approachable,” he said.

Carolina Innovative Food Ingredients (CIFI) has long tapped sweet potatoes for their coloring capacity. The company’s nutrient-dense cloudy sweet potato juice provides a natural orange/amber color and mild sweetness to everything from fried snacks to baked goods. “You could use it in a sweet-potato hamburger bun, naturally adding color, flavor and sweetness to make it stand out on the shelf,” said Paul Verderber, senior vice president of sales, CIFI. Being from locally grown, upcycled sweet potatoes, the colorant even has a “compelling waste and sustainability story,” he added.

Gebhardt noted that heat- and pH-stable natural reds have been difficult to achieve naturally. Beet looked like a viable source, but browns at high temperatures. Thus, Sensient introduced its SupraRed technology to create a highly concentrated, heat-stable beet-based colorant that “achieves bright, vivid red shades that stand up to baking and extrusion,” he said, even at neutral pH.

Maria Jose Alarcon, product experience marketing manager for colors, ADM, said ADM offers a complete range of acid- and heat-stable colors including a patented blue derived from fruit juices that’s stable at every pH. “That means we can apply it to almost every type of food,” she noted. “Plus, our color team can combine this unique blue with other colors to make purple, green and brown color blends, allowing a complete range of colors.”

Sensient Food Colors fills a gap in “denim blues” with its catalogue of spirulinas, pH-modified anthocyanins and blue vegetable juices that open the door to rich purples while also helping manufacturers address the need in pet foods for heat-stable botanically based greens.

“With recent regulatory and Association of American Feed Control Officials recommendations steering away from some green and blue sources like chlorophyll and huito, new and current pet products may need new green colors made from alternative blue sources,” Fox explained. Blends of their natural blue vegetable juices and yellow options like beta carotene and turmeric “reach beautiful green shades that withstand the heat of extrusion.”



Special delivery

Beyond colors and flavors, suppliers are creating delivery forms that also improve performance.

"We've been doing quite a bit of work on making our delivery systems much more efficient for flavors," Warsaw said. "This involves protecting them from loss during processing and storage. We make the flavor 'come to life' when called upon during cooking or consumption, lessening the amount of flavor needed in the product and giving consumers the experience they're looking for."

Antioxidants and emulsion advances have let color developers make great strides in delivering high-performance yellow, orange and red hues. "I'm looking forward to new products with functionalities that provide difficult hues for certain applications," Huff said. "By creating new delivery systems that force pigments to interact with light in different ways, we can achieve hues that so far haven't been attainable with certain pigments."

And by creating plating-grade natural colors that produce bright, stable hues in dry blends and fat- and oil-based systems alike, Sensient Food Colors' Microfine technology has widened the range of botanical colorants that can function in fat-based systems. "Microfines perform similarly to synthetic lakes and will homogeneously color the dry or fat-based system without any speckling," Gebhardt said.

Gaps remain

Despite these quantum leaps, natural colors and flavors still face hurdles, not least of which is the fact that some artificial flavors contain aroma compounds that are unavailable in natural form.

Making sense of flavor categories

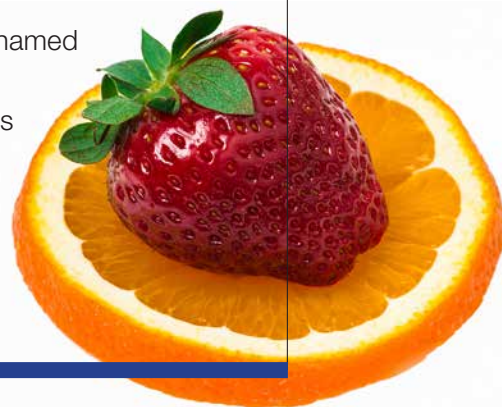
In the flavor-chemistry world, there are distinct categories of flavors. Using orange as a case in point, here's how to wrap your brain around them, courtesy of Keera Perumbala, marketing manager, Sensient Flavors.

Natural Extract/FTNF (from the named fruit): This means direct from the source. (e.g., natural orange extract: 100% natural orange)

Natural Flavor WONF (with other natural flavors): Natural flavoring from the named fruit as well as another natural flavors to complement it. (e.g., natural orange WONF: natural orange + natural strawberry)

Natural Flavor Type: The ingredients are all-natural, but the named fruit is not present nor is allowed as an image on the product packaging. (e.g., natural orange type: natural flavor compounds derived from botanicals, excluding orange)

Natural and Artificial Flavor (N&A): The named fruit is present as a natural ingredient, but other ingredients may be natural or artificial. (e.g., N&A orange: natural orange and flavor chemicals that are synthetically derived).





“These chemicals may not be found in nature, may have unstable natural forms or may be too expensive to isolate from a natural source,” Jackson explained. Sweet browns, as well as nut pyrazines and indulgent furanones, are common examples.

“Combinations of natural aroma compounds can often recreate the flavor profile of materials that are only artificial,” Jackson noted, “but a substitution may result in flavor changes.” Consider the conversion of artificial vanilla to natural: “Ethyl vanillin isn’t found in nature, so we typically use a higher amount of vanillin, but it has a solubility limit in a flavor, thus altering the profile slightly and making it less than a direct match.”

Facing up to functional

Another stumbling block for natural colors and flavors is functional formulation. “According to [Innova Market Insights](#), the functional food and beverage category is expected to reach \$279 billion by 2021,” with fiber, protein, probiotics and vitamin fortification all popular, noted Fisher.

But such ingredients—proteins especially—not only often taste unappealing but can interact with natural colors and flavors in ways that defeat their stated purpose.

As Mittelheuser pointed out, proteins “may wrap or engulf certain components of a flavor and mute them or make them less intense.” And don’t forget the chalky textures and astringent off-notes they themselves contribute.



The introduction of CBD to some formulations has developers scrambling for color and flavor solutions that play well with this complicated ingredient.

The main challenge with coloring protein products often boils down to achieving the same look and taste of animal protein, but in a plant base. This puts the focus on plant-based sources of meaty reds, whites for imitation seafood and browns resembling faux poultry and deli cuts, Fox said. Sensient’s seen demand for its red-beet portfolio, as well as its natural brown Sienna fruit juice and natural titanium dioxide alternatives rise as a result.

“We developed several natural red blends that turn brown when cooked, imitating raw beef,” noted Stephen J. Lauro, general manager, colorMaker Inc. However, “each plant-based protein company has a slightly different visual target for its imitation hamburger patty, taco meat, hotdog, etc. And each plant-based protein company has different criteria for its finished product, from non-GMO to kosher, halal and organic,” he said.

Other challenges to coloring and flavoring naturally good-for-you products involve contending with salt and sugar reduction, the off tastes common to high-intensity sweeteners and more. The introduction of CBD to some formulations has developers scrambling for color and flavor solutions that play well with this complicated ingredient.

“CBD oil can be challenging to color because only a handful of natural emulsifiers effectively disperse natural colors throughout the oil without streaking,” Lauro explained.

Experts share their tips on formulating with natural flavors and colors

“I tell our customers that communication is everything. We advise product developers to be as forthcoming as possible about what the end product goals are. Work closely with your flavor partner on the ingredients and incipients that’ll be present. Understand what the sweeteners, gums, acid and processing will be; we need to know what could possibly happen in production. So, work hand-in-hand when it comes to formulating. Lean on your supplier.”

Jason Mittelheuser, technical business development, FONA International Inc.

“There may be limitations to the performance, profiles and costs related to natural flavors, but it’s always good to have these discussions with your flavor supplier upfront, in the beginning stages of both product and flavor development. Understanding all the potential challenges will help increase your odds of developing a successful product.”

Michael Crane, senior flavor chemist, Comax Flavors

“Always give feedback. Feedback—positive and negative—can help improve the overall product. The best results come from experienced formulators, not ingredients.”

Michael Levine, director strategy and product management, flavors, Glanbia Nutritionals

“Look for a supplier whose main focus is on coloring foods. You should make sure that your supplier understands the product from farm to benchtop. It’s important that it has an ample variety of fruits and vegetables to ensure that all color hues can be matched. During the early phase of product development, you want to make sure that you do stability testing. A good supplier should offer these capabilities.”

Jeannette O’Brien, vice president, GNT USA Inc.

“My advice is to educate and spread the good word. We tend to silo ourselves from one another and from consumers. Now more than ever, we need to work together for solutions. We all have a powerful piece of the puzzle, and if we collaborate more and communicate for a positive solution, we’ll be more successful. We have so many answers; we just need to share them strategically for all involved.”

Anna Cheely, senior scientist/manager, applications, Kalsec

Supply strains

Lauro also shined a light on what he thinks will be a major theme for natural colors and flavors going forward: capacity. “Can the natural industry meet the growing demand for natural colors and flavors?” he asked.

It’s no idle inquiry. “Sourcing, sustainability and cost concerns will continue to challenge flavor and product developers,” Crane said. “Economic, political, environmental and other global issues may add to the challenges of maintaining cost-effective natural flavor profiles for use in food and beverage products.”

It hardly helps that sourcing natural colors and flavors isn’t always as green as consumers or industry would like. “It may seem counterintuitive, but sustainability is one area where synthetic components often have an advantage,” Miesle noted. “They’re often more sustainable than natural options.”

Moreover, Mother Nature is fickle. “We can count on her to interrupt supply occasionally,” he continued. “Whether a hurricane knocks down citrus groves, a typhoon swamps onion production or drought interrupts agriculture, there will be surprises along the way.”

Consider the current crisis in vanilla. “As many large-scale producers try to remove artificial ingredients from their product labels, demand for real vanilla outstrips supply,” Caputo noted. And though global volatility in the commodity appears to be stabilizing—producing a slight price decline—the market remains fragile.

Fisher pointed to FlavorChem’s natural vanilla extract enhancers as temporary stopgaps that feature real vanilla and can simulate, replace or enhance the performance of pure vanilla extract. “They offer an authentic taste, supply stability and consistent quality,” she said.

Difficult conversations

Next on product developers’ to-do list: coloring and flavoring products without ... colors or flavors.

“The newest hurdle is how to use flavor ingredients and not list the word ‘flavor’ on the label,” Harvey said. Why? For a small subset of consumers, even natural flavors are suspect. “This will provide more challenges for developers,” she noted.

Dratt encouraged product developers to get frank with flavor and color suppliers from the start. “We often have difficult conversations with our customers early in the relationship,” he said. “Because sometimes, there’s space between what you want and what you can get with natural ingredients. So, let’s talk about what we can do to hit that trend you’ve identified, even if you can’t go as far as you thought you could.” Even then, “maybe that’s okay,” he said.



Kimberly J. Decker is a Bay Area food writer. While her love of eating led her to study food science at the University of California, Davis, her love of the written word prompted her to minor in English. Since then, she’s worked in product development for the frozen sector and written about food, nutrition, and the culinary arts, getting her hands into everything from cookbook projects for local chefs to corporate communications and regular appearances on the pages of industry journals.

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Meeting clean label expectations with natural colors and flavors

by Holly McHugh

INSIDER's take

- Consumers are increasingly looking for cleaner, natural products free from artificial colors and flavors.
- Natural colors can impart beautiful hues and health benefits, but heat, light and pH can reduce vibrancy.
- Brands opt for natural flavors made from raw materials, essences and extracts to ensure clean labels.

Consumer concerns about the perceived health risks of synthetic ingredients

have propelled the clean label movement from a trend to an expectation. Products identified as natural, organic and environmentally friendly are believed to be healthier, safer and contribute to one's overall wellbeing, according to Packaged Facts' 2018 report "[Organic and Clean Label Food Consumer in the U.S.](#)" Brands are responding by formulating, or reformulating, with natural sources and using "free from" claims to position products as better-for-you.

The benefits of using natural colors and flavors sometimes go beyond their primary function. Many of these natural enhancers have inherent health benefits like powerful antioxidants, relaxation support and anti-inflammatory properties. However, realities like cost and shelf life need to be considered while also meeting consumer expectations for what a product should look or taste like when using these ingredients.

Color

Consumers are trained from an early age to believe color represents flavor profile, freshness and overall quality of a product. For that reason, it's important to consider appearance and source of colorants to achieve the ideal experience for your target consumer.

Natural colors, or colors that are exempt from certification, come from natural sources like vegetables, minerals or even animals. Thirty-eight colorants are exempt from certification for food and beverage, such as grape color extract for purple, beet juice for red, and turmeric for yellow.

In addition to imparting color, many of these ingredients have functional benefits. Spirulina, one of the most common natural color sources for blue or green, has essential amino acids and is rich with calcium, niacin, potassium, magnesium, B vitamins and iron.¹ Beta-carotene, an antioxidant found in many vegetables,² is used to create a red-orange color in products like Izze clementine flavored sparkling juice and Kellogg's Strawberry Krispies cereal.



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Of course, the benefits of these ingredients are dependent on the amount incorporated into the product, which is why some brands use them at higher levels to impart color, flavor and function. Ingredients like blue algae, beet, matcha and turmeric make beautiful beverages full of health benefits. One of the rising stars in beverage is turmeric because of its bold color and anti-inflammatory properties.³ Several brands such as Rebbi and Pop & Bottle have launched ready to drink (RTD) golden milk products, and a handful of third-wave coffee shops are serving lattes with turmeric for its inherent health benefits and the Instagram appeal of the bright yellow beverage.

While natural colors offer many advantages, these types of ingredients can be challenging when formulating RTD beverages. Before clean label became common, most beverages were colored artificially using synthetic colors to maintain color intensity, so bright, bold colors are something consumers have come to expect. Natural colors are more sensitive to pH as well as fading due to heat during processing and light; therefore, product developers must choose natural colors that will maintain intensity throughout processing and on the shelf. Despite these challenges, certain methods can protect the integrity of the product when formulating with these colors, such as masking agents and packaging with a UV barrier.



Increasing the levels of a color can also create bolder colors, though too much color can impact the flavor profile of a product.



Knowing the target pH of a product can help inform what natural color will maintain the desired appearance through processing and shelf life. For example, reds at a certain pH will turn purple and get dark or muddy, so it's important to choose a natural color that works within the beverage matrix. Increasing the levels of a color can also create bolder colors, though too much color can impact the flavor profile of a product. Cold-pressed juices are an exception because they use high-pressure processing (HPP) instead of a thermal heating process, which results in a much brighter, fresher product. However, the shelf life of cold-pressed juices is much less than traditionally pasteurized juices.



Flavor

Marketing claims are driving choices for flavor sources because brands want to position products as clean label and differentiate them from the competition. Demand for clean label has led many brands to formulate with natural flavors only, even steering clear of WONFs (with other natural flavors) that come from natural sources and help flavorists highlight finer nuances to complete a flavor profile that an essential oil or fruit juice lacks. Instead, more brands are opting for natural flavors made from raw materials, essences and extracts.

Botanical flavors, which have experienced significant growth during the last few years, are ideal for natural flavors because many flowers, herbs and spices are available as raw materials. Flavorists can create a solid flavor profile that captures the subtle notes of botanical ingredients and since the raw materials descend from nature, they can sometimes be less expensive than an artificial version. These flavors can also have functional benefits to the consumer, such as the calming effects of lavender⁴ or digestion support from ginger.⁵

Nuts and berries are also popular flavors available as raw materials, but many brands want these natural flavors to be allergen-friendly, which is counterintuitive if it's coming from the authentic source. However, these flavors can be crafted using different flavor components to meet the desired taste profile. Fantasy flavors that are man-made creations like s'mores, cotton candy or birthday cake also require more flavor expertise and ingredients to simulate them with natural ingredients, which makes them more expensive than an artificial flavor created with a synthetic raw material.

Another trend in the flavor industry is organic flavors, especially since the guidelines for flavors in certified organic products will [change at the end of the year](#). These changes will require brands using certified organic claims to use only organic flavors, unless an organic version of that flavor is not achievable because the organic extracts and/or oils needed are not commercially available.

Incorporating organic flavors can make a product appear more healthful since the raw materials are produced with no synthetic pesticides. However, the taste profiles of an organic flavor are distinctly different because the raw materials are produced using a cleaner process that makes crops more vulnerable to environmental factors. This can create a challenge for brands with products on the market that are transitioning from organic compliant to certified organic because the flavor profile will likely change. Additionally, environmental factors can affect supply chain, which impacts cost of raw materials.





Consumers are taking the saying “you are what you eat” to heart and becoming mindful about how food and beverage ingredients affect health and wellbeing. The importance of health and wellness among consumers will continue to proliferate, especially with younger generations who are raised with these ideals and have grown up with access to information online. Though synthetic colors and flavors are still common in food and beverages, an increasing number of brands are listening to consumer demands for simple, natural ingredients and making changes to products. The operational realities of using natural colors and flavors include cost and shelf life, but pressure from consumers combined with the inherent benefits of natural ingredients will drive growth for years to come.



Holly McHugh is the marketing associate at [Imbibe](#), a Chicago-based beverage development company. She focuses on the company's external communications and brand awareness. She also monitors and analyzes beverage trends to guide clients in making strategic decisions about product development. McHugh's market insights have been published in *BevNet*, *Beverage Industry*, *Natural Products Insider*, *Prepared Foods* and *Food Ingredients First*. She has a bachelor's degree from Columbia College Chicago and a master's degree from the University of Denver.

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A close-up, shallow depth-of-field photograph of a person's hands typing on a white laptop keyboard. The fingers are positioned over the keys, and the background is softly blurred, showing hints of a desk and other objects. The overall tone is professional and tech-oriented.

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Coloring outside the lines: Innovators disrupt the beverage aisle

by Tom Vierhile

INSIDER's take

- Beverage categories are seeing an increase in U.S. product launches.
- Innova Market Insights sees carbonates suffering long-term pain.
- Established categories are seeing an influx of disruptive innovation.

The beverage sector has long been one of the most vibrant parts of the

fast-moving consumer goods marketplace. With low barriers to entry, a growing consumer tendency to seek out novelty across the food and beverage spectrum, and an ebbing of the market dominance of the traditional soft drink giants, the beverage market is wide open for disruption.

This “red carpet” approach welcoming new product innovation is reflected in recent new product launch trends. According to Innova Market Insights’ Innova Database, 12 of the 21 beverage categories tracked by the market research firm saw increases in U.S. product launches of 10% or greater for the 12 months ending June 30, 2019, versus the comparable year ago period. Five beverage categories racked up new product gains of 25% or higher: flavored milk, energy drinks, ready-to-drink sports drinks, dairy alternative drinks and carbonates.

Disruptors ignore slow-to-no growth projections

To see such robust new product growth in categories such as flavored milk and carbonated soft drinks is a surprise given the muted long-term growth prospects for both areas. Innova Market Insights sees carbonates suffering long-term pain, with negative “growth” in the U.S. for the foreseeable future. But that has not deterred innovators, especially smaller companies targeting market niches.

That describes Chicago-based Petal, creator of Petal Sparkling Botanicals—a “unique organic beverage experience that sparkles with wild, rebellious, flower-powered goodness.” New flavors such as Lemongrass Dandelion and Peach Marigold with a hint of basil showcase antioxidant-rich botanical ingredients in a low-sugar-content sparkling drink with just 10 calories per 12-fluid-ounce serving. Consumers do see something special with floral flavors. According to the 2019 Innova Flavor Survey, half of all consumers in the U.S. and the UK associate floral-flavored drinks with freshness and herbal-flavored drinks with healthiness.



Five beverage categories racked up new product gains of

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flavored milk, energy drinks, ready-to-drink sports drinks, dairy alternative drinks and carbonates.

According to Innova Market Insights' Innova Database

Disruptors focus on non-sweet flavor innovation

Non-sweet flavors offer considerable white space for carbonated beverage innovators. Cocktail mixers that can be served with or without alcohol have been filling this white space. New offerings like Hella Cocktail Company's Bitters & Soda in flavors such as Dry Aromatic provide taste without high calorie regret as each 8.4-fluid-ounce can has just 5 calories and zero sugar. The brand notes "bitters are an effective and long-trusted aid to stimulate and facilitate healthy digestion." Though Regatta Royal Oak Ginger Ale makes no functional claims, the addition of oak flavor to ginger ale is noteworthy for a beverage long associated with functionality.

Trends in health claims can help flesh out white space, and no health claim grew faster than the "sugar free" claim for the 12-month period ending June 30, 2019. According to Innova Market Insights' Innova Database, 10.2% of U.S. beverage launches made during that year period claimed to be sugar free, up from 6.9% of launches for the prior year period. Other claims showing considerable momentum include GMO free (now on more than 23% of all new U.S. beverages) and high/source of protein, now on over 9% of all U.S. beverage launches.



Non-sweet flavors offer considerable white space for carbonated beverage innovators. Cocktail mixers that can be served with or without alcohol have been filling this white space.

The latter claim is providing latitude to flavored milk makers. Confectionery giant Mars recently debuted Snickers and Twix Chocolate Lowfat Milks, a pair of specialty chocolate milks with 14 g of protein per 14-fluid-ounce bottle. At the other end of the spectrum, Burroughs Family Farms' new Organic Lavender Milk is described as a "refreshing and creative flavor" and "not something you will find on every shelf." That sense of discovery could interest the two-thirds of U.S. consumers that say they love to discover new flavors, per the 2018 Innova Trends Survey. Lavender's obvious connection with relaxation and sleep could also generate interest.

Disruptors are not deterred by dominant brands

Even categories long dominated by one or two brands are seeing an influx of potentially disruptive innovation. Energy drink brands such as Adrenaline Shoc may not make Red Bull break out on a cold sweat, but the former's approach illuminates white

space that could change the game. With its proprietary high-performance natural energy blend of green coffee beans, yerba mate, coffee fruit extract and guarana along with naturally sourced electrolytes and nine essential amino acids, Adrenaline Shoc targets both the traditional energy drink space and the newer performance energy drinks market. “As the ‘healthier performance’ energy category grows, we believe retailers will embrace products like Adrenaline Shoc that target a younger consumer with modern demands” said Lance Collins, “serial beverage entrepreneur” and creator of Adrenaline Shoc.

Innovators from outside of traditional beverage categories may also shake things up. Berkeley, California-based Daytrip Beverages, a “cannabis lifestyle brand,” endeavors to disrupt the bottled water market with Daytrip CBD-Infused Sparkling Water in flavors such as Lemon Lime and Tangerine. And in markets that permit the sale of recreational marijuana products, the company plans to introduce a THC-infused sparkling water. Controversial ingredients like CBD could disrupt established markets and brands crossing over from the dispensary side of the business may bring a new generation of consumers with them.



Tom Vierhile is vice president of Strategic Insights North America for Netherlands-based [Innova Market Insights](#) and has more than 20 years' experience in packaged goods reporting and analysis. Based in Fairport, New York, he is a new product marketing expert and has been quoted by Bloomberg, Ad Age, The Wall Street Journal and NPR. Vierhile has given presentations on new product trends at conferences in the United States, Europe, Asia and South America. He has a bachelor's degree in marketing from St. Bonaventure University and an MBA from the State University of New York at Buffalo.

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Colors and flavors at SupplySide West

Learn more about market trends and how consumer demand shapes natural colors and flavors from Tom Vierhile during the “Colors & Flavors: Superheroes of Product Success” workshop on Thursday, Oct. 17 at 9:00 a.m., at SupplySide West in Las Vegas.

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Also, listen to some of his insights on natural colors and flavors at “Looking at the data behind natural colors and flavors — podcast.”



Clean label driving growth in natural colors and flavors

by Alex Smolokoff



INSIDER's take

- The clean label movement has led consumers to seek natural colors and flavors in their foods, beverages and supplements.
- People are seeking more natural ingredients—including colors and flavors—in the products both they and their children consume.
- Substituting natural colors and flavors in place of artificial ones comes with many formulation considerations.

“Clean label” means a lot of things in a lot of contexts, but in the natural health and wellness, and greater food and beverage spaces, it typically comes down to recognizable, easy-to-pronounce, natural ingredients in place of artificial ones.

Increasingly, this clean label revolution is also leading consumers to seek natural food colorings and flavors in place of their artificial counterparts. [According to New Hope Network surveys](#), 71% of consumers today are avoiding artificial flavors; 63% are avoiding artificial colors.

This shift hasn't happened overnight, and CPG brands are beginning to formulate their products with these new consumer tendencies in mind. Proprietary data from Informa Markets' NEXT Data and Insights team showed increases across numerous categories in natural color and flavor claims. Between Natural Products Expo West 2017 and 2019, “natural colors” claims saw increases in product listings such as frozen foods (379% increase), dairy (231%), baked goods (121%), snacks, cookies and candy (59%) and drinks (35%), among others. The “natural flavor” segment witnessed share of growth increases in many product categories with the highest growth in meat and seafood (67%), soups and canned goods (36%), bakery (34%) and drinks (30%), as well as smaller growth in categories, such as deli, snacks/cookies/candy, and even pet food.

Between Natural Products Expo West 2017 and 2019, “natural colors” saw share of growth increases in product listings, such as



The “natural flavor” segment grew in many product categories as well over that same two-year period, with the highest growth in



Source: Informa Market's NEXT data and insights team



The growth in natural colors and flavors at Natural Products Expo West is a microcosm of the greater food and beverage industry. Proprietary data from Netherlands-based Innova Market Insights showed overall growth from 2016 to 2018 in new product launches with natural colors within the United States in many of the same product categories. Cold cereal leads that growth with a 31.43% compound annual growth rate (CAGR) over that time, followed by dairy yogurt (23.2% CAGR); table sauces (14.35% CAGR); and cakes, pastries and sweet goods (7.05% CAGR). Carbonates and seasonings also saw modest growth in new products using natural colorings.

Both NEXT and Innova Market Insights found declines in natural flavors and colors being used in other categories. Cooking sauces, dairy-based ice cream and frozen yogurt, dairy yogurt and potato-based snacks all saw declines in new product launches with natural colors, while NEXT also reported declines in share growth for natural colors in spices, sauces and seasonings, as well as deli meats and diet and nutrition products. NEXT also reported a decline in share growth for natural flavor offerings in the baby food and supplements, cosmetics and condiment product categories, among others.

Even with declines in some categories, the market as a whole is thriving. The global retail value of packaged food with a “no artificial colors” claim grew about 3% from 2015 to 2016, [according to Euromonitor International](#). The market for “no artificial flavors” claims grew similarly. By 2016, the retail value of foods free from artificial colors reached nearly US\$50 billion; “no artificial flavors” claims had a retail value not far behind at \$41 billion.

Swapping out artificial colors or flavors for natural ones is difficult enough; doing so while ensuring the top purchase-driver for consumers—taste—remains unchanged is a difficult problem to solve even for the world’s largest companies.

Some have been able to do so without skipping a beat. Kraft Heinz removed all artificial preservatives, colors and flavors from its popular boxed mac & cheese in December 2015. Only in March 2016, when the company launched a marketing campaign centered around the switch, did anyone notice; in the meantime, The Kraft Heinz Co. sold more than 50 million boxes of mac & cheese utilizing natural colors and flavors like paprika and annatto in place of colored dyes.



Other major CPGs have attempted to transition from artificial to natural less smoothly. General Mills Inc. in 2017 attempted to swap the artificial colors and flavors in its Trix brand cereal for natural alternatives; people not only noticed, but disapproved of the new, muted colors.

“Our ... fans have been calling us, emailing us and reaching out to us on social media asking if we would consider bringing back the original formulation of Trix cereal with its vibrant colors,” said Mike Siemienas, a General Mills spokesman, in a September 2017 press release. That call led to a re-release of the “classic” formula, though General Mills continued producing the natural version as well with four colors rather than the usual six, since blue and green proved difficult to reproduce naturally.

Many products that currently utilize bright, artificial colorings are marketed toward children, who are both harder to please and far less likely to be apprehensive about the ingredients in their food.



The Trix mishap highlights one of the difficulties facing the shift to natural colors: Many products that currently utilize bright, artificial colorings are marketed toward children, who are both harder to please and far less likely to be apprehensive about the ingredients in their food. That, however, won't stop parents from seeking those alternatives, especially in the last decade or so since the 2007 University of Southampton's study (*Lancet*. 2007 Nov 3;370(9598):1560-7) linking food colors to hyperactivity in children. This is shown in both the aforementioned growth in natural color and flavor use in categories such as cold cereal and candy and the blowback to General Mill's Trix reformulation; parents will look to buy products perceived as healthier or more natural, but will kids continue to eat them?


Candy is another category showing strong growth—according to NEXT data—that is likely driven by parents looking toward healthier options for their children. However, there

is reason to believe this category could avoid some of the pushback experienced by General Mills. [Christiane Lippert, head of](#)

[marketing, food at Lycored, wrote for INSIDER in January 2019](#)

about the perceptions of both children and their parents toward colors in candy. In one focus group, 10 adults and their children were sent two bags of gummy candies: one colored artificially and one colored with Lycored's carotenoid-derived colors. While, as Lippert





wrote, all participants could easily see the difference between the two, the children were all as willing to eat the naturally-colored version as the artificially-colored.

“When asked if they would be willing to eat the naturally colored gummies, they answered ‘yes’ with enthusiasm,” she wrote. “A typical response was: ‘Of course, it’s candy! They are both candy—I would eat both!’ In other words, natural colors were not a ‘deal breaker’ for kids.”

Interestingly, Lippert also explained natural colors and flavors can lead to the perception of healthier overall products, and many of the parents involved assumed the naturally colored gummies contained fewer artificial sweeteners and sugar as well.

While bright, attractive colors certainly catch the attention of children, adults are not immune to their allure either. The difference is adults are also looking for good-for-you ingredients to deliver those colors.

These two trends—functional ingredients in foods and beverages and a desire for natural colors and flavors—go hand in hand. Alex Wendling, M.S., president of Custom Flavors, a division of Custom Ingredients, told **INSIDER** in a [January 2019 article](#) that “growing interest in improved nutrition has resulted in a strong push for floral and berry flavors that align with phytonutrient-rich foods such as Hibiscus or Lingonberry.” For CPG brands to pair the functional benefits of various fruits and botanicals with the clean-label appeal of natural flavors to go with them is a no-brainer.

As **INSIDER** previously reported in the above article, Sensient Colors Group, a unit of Sensient Technologies Corp., “predicted continued interest in bright colors and extracts sourced from natural superfoods like turmeric, elderberry, spirulina and chlorella, as well as surge in beet juice coloring solutions” in both foods and beverages, thus allowing consumers to benefit from these functional ingredients without sacrificing visual appeal.

Ultimately, all food and beverage products must look and taste good. Even the most health-conscious among us demand their food taste good, and today’s shifting demographics and technology-driven society also increasingly demands food looks good, lest we be unable to Instagram it. The marriage of foodies and social media has led to an increased need for food that looks as good as it tastes.

But today’s consumers are also looking for their food to be clean, simple and natural—even when indulging in snacks and sweets or having a quick on-the-go breakfast or beverage. These product categories that allow consumers to feel that sense of indulgence while also feeling good about the ingredients they’re consuming are primed for continued growth.



Natural: an enticing cosmetic label

by Catherine Bailey and John Bailey, Ph.D.

INSIDER's take

- 'Natural' implies an ingredient came from nature, but it's often difficult to manufacture cosmetic without using chemical processes.
- FDA hasn't defined 'natural,' but the agency requires brands to ensure their products are safe when used according to directions on the label.
- FDA has stated all color additives are synthetic, so "natural colors" must be an inherent color of an ingredient not added for coloring.

It's "natural," a cosmetic label might claim. But it may not really be natural, and it could even be an illegal marketing claim.

"Natural" labeling became popular in the 1970s to catch the imagination and soothe anxieties or concerns with prevailing chemophobia associated with some suspected carcinogens. Some of us may remember the [cyclamate](#), [saccharin](#) or [Red 2](#) stories, for example. Synthetic ingredients such as these were cast in a bad light as unsafe or downright dangerous. The public began to perceive "non-artificial substances" as inherently more desirable and safer. Thus, the market began to shift in identifying products and their ingredients as more like Mother Nature intended. These market perceptions continue today and have even become more sophisticated.

Natural defined

Among the many definitions ascribed to the adjective "natural," perhaps the simplest is, "existing in or produced by nature, i.e., not artificial" ([Merriam-Webster](#)). Natural implies the absence of man-made sources. However, from a chemist's perspective, this is difficult to attain. After all, many starting materials are petroleum- or coal-based; and most manufacturing processes—even when beginning with a plant raw material—use processing techniques that may include chemical modification and synthetics such as organic solvents.

Natural isn't necessarily safe, either. As we all know, Mother Nature has virulent poisons in her arsenal. In food, for example, molds can produce naturally occurring environmental toxins such as patulin or fumonisin.

It's not so easy to be sanguine about using "natural" on a label. FDA and FTC have commented on its use. We'll begin with FDA's comments on food because some of the policies expressed also apply to the regulation of cosmetic ingredients, especially color additives. Product labeling must by law be truthful and not misleading.

FDA comments on natural labeling for food products

In 2016, the FDA published a [notice](#), requesting comments on the definition and appropriate use of "natural" in labeling.

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“Although FDA has not engaged in rulemaking to establish a formal definition for the term ‘natural,’ we do have a longstanding policy concerning the use of ‘natural’ in human food labeling,” the agency wrote in the notice. “The FDA has considered the term ‘natural’ to mean that nothing artificial or synthetic (including all color additives regardless of source) has been included in, or has been added to, a food that would not normally be expected to be in that food. However, this policy was not intended to address food production methods, such as the use of pesticides, nor did it explicitly address food processing or manufacturing methods, such as thermal technologies, pasteurization, or irradiation. The FDA also did not consider whether the term ‘natural’ should describe any nutritional or other health benefit.”



FDA hasn't defined the word “natural” for cosmetics, and cautioned it does not guarantee products or ingredients are “safe.”

FDA received a large number of [comments](#). However, the initiative was later abandoned as a high priority.

FDA and FTC comments on natural labeling in cosmetics

FDA hasn't defined the word [“natural” for cosmetics](#), and cautioned it does not guarantee products or ingredients are [“safe.”](#)

FDA cautioned manufacturers to ensure their products are safe when used according to directions on the label. While labeling must be truthful and not misleading, the use of trade puffery is generally accepted within limits. However, implying “natural” for ingredients such as color additives, which by statute must be listed via a petitioning process, may invite regulatory scrutiny.

Based on an examination of recent warning letters, recalls and other compliance information on FDA's website, simple use of the word “natural” on cosmetic labeling doesn't appear to trigger FDA regulatory scrutiny. Understandably, most concern centers around microbial contamination. For example, see [Import Alert 53-17](#).

While FDA regulates cosmetic labeling claims, FTC regulates advertising claims. In settlements [cited by FTC in its blog](#), the agency noted: “What can other marketers take from the proposed settlements? That ‘all-natural’




or ‘100% natural’ mean just that. If you advertise your product as ‘all-natural’ or ‘100% natural,’ and it contains artificial ingredients or chemicals, now is the natural time for a compliance check.”

Natural color additives

A color additive is a dye, pigment or other substance capable of imparting color when added or applied to a food, drug, cosmetic or to the human body. The legal definition can be found in Section 201(t) of the Federal Food, Drug, and Cosmetic Act (FD&C Act) and provides exclusions as well. Color additives for use in food, drugs and cosmetics require premarket approval.

FDA has stated all color additives are synthetic. Of course, we must consider whether the color is “added.” For example, consider a lotion formulated with cosmetic ingredients not intentionally added for color versus a lotion to which a color is intentionally added, e.g., D&C Red No. 33. The first situation would not require a declaration of the presence of color. On the other hand, the intentional addition of a coloring agent such as D&C Red No. 33 means the color must be declared in the ingredient declaration.

To elaborate, one may consider “natural color” as the inherent color of an ingredient not intentionally added for coloring and which is unimportant insofar as appearance, value, marketability or consumer acceptability. Meeting such a labeling designation can be a difficult challenge. To avoid regulatory attention, the wise policy is to ensure all color additives are appropriately listed in the ingredient declaration. 



EAS independent consultant, Catherine Bailey, is a former director of FDA's Division of Cosmetics and Compliance, where she oversaw the voluntary cosmetic registration program (VCRP) and provided oversight of federal regulation and research related to cosmetics. Catherine Bailey had a 32-year career with FDA, starting as a chemist in the Division of Color Technology, oversight of federal regulation and research related to cosmetics in the U.S., and working as a project manager for food and color additive petitions. Following her retirement from FDA, she joined the Personal Care Products Council as a staff scientist. Catherine Bailey assists EAS clients with cosmetic labeling issues and color additive petitions.



John Bailey, Ph.D., is EAS Consulting Group's independent advisor for colors and cosmetics. John Bailey is a former director of FDA's Office of Cosmetics and Colors, a position he held from November 1992 through August 2002. His 34-year agency career began as a chemist in the Division of Colors and Cosmetics. He soon moved to the Division of Color Technology and advanced to become a senior research chemist. He went on to serve in other prominent agency positions, including that of director of the Office of Applied Research and Safety Assessment in the Office of Science. After his retirement from the agency in 2002, he joined the Cosmetic, Toiletry and Fragrance Association as director of cosmetic chemistry, and later joined the Personal Care Products Council as executive vice president for science.



Flavorful compliance considerations

by Jim Lassiter

INSIDER's take

- While 'natural flavor' is legally defined, brands must also consider the ramifications of a characterizing flavor.
- If a large amount of flavor is needed, brands need to consider label requirements, such as added sugars.
- Brands must hold a certificate from the supplier that states masking agents do not contain artificial flavors.

“It’s so tasty too—tastes just like candy”

—Lucille Ball as the Vitameatavegamin Girl

The increase of healthy attributes in more traditional food forms has driven

brands to ensure the flavor and presentation of these products meet consumer expectations. However, achieving good flavor and presentation is insufficient alone for the growing demands of clean labels, which push formulators’ skills even more. The science of flavor systems is more involved, making things look and taste better. Brands are using natural colors and flavors where available as consumers increasingly perceive artificial ingredients as unfavorable. Brands must consider more than finding the right natural flavors and colors to achieve the desired effect, because regulations require certain disclosures of flavors.


This serves as background for a colorful and flavored look at the matter, naturally.

Natural flavors are clearly defined in the regulations. The term “natural flavor” or “natural flavoring” is defined in 21 CFR §101.22(a)(3). “Natural color” and “natural coloring” have no regulatory definition. Meeting the definition of a natural flavor is straightforward. One challenge arises when the product has a “characterizing flavor” for the product. A characterizing flavor occurs when a brand shows by words or graphics that it wishes to present the product with a specific flavor target. The regulatory requirement is the name of the food be accompanied by the common or usual name of the characterizing flavor. A simple example would be vanilla whey protein. Alternatively, the product identifier could be Buff Bob’s BCAA’s—Blackberry, with the flavor designation shown immediately following in type not less than half the size of the name of the product. This is where the simplicity and compliance start to grind down slowly.


Flavor systems that mask the properties of natural ingredients are common in the health and nutrition industry. Brands use trending natural flavors to create palatable products, but regulatory requirements create limitations. For Buff Bob’s BCAA’s—Dragonfruit, the characterizing flavor is dragonfruit. The term “[natural flavor](#)” is defined as the “essential oil, oleoresin, essence or extractive, protein hydrolysate, distillate, or any other product of roasting, heating or enzymolysis, which

contains the flavoring constituents derived from a spice, fruit or fruit juice” Therefore, the brand must ensure flavor constituents are derived from dragonfruit. If the product does not contain dragonfruit, the requirement is to label the product as “artificially flavored.” Brands must be aware of compliant labeling of naturally flavored products to maximize their messages, while keeping regulatory challenges to a minimum.

Flavoring systems typically are spray-dried and contain a flow agent. These substances would not be ordinarily disclosed by a flavor supplier and would most likely be considered incidental additives. That is unless the flavor system has a notable percentage of the flavor—inclusive of the carriers—and where a serving size is large. In this case, the carrier may trigger a claim regarding carbohydrates and/or added sugars. The ingredients listing will likely show the individual flavors used, and none of those will say “dragonfruit.” This would need to be labeled as artificially flavored.



The proper labeling of flavored products is not simple. Brands must know a great deal about the identification of a “natural flavor.”



A brand must also consider the other claims made on the package and in labeling. If the flavor system contains, say, dextrose, it would be inappropriate to continue labeling your product as being “sugar free” or “no added sugars.”

Masking agents are substances that may be identified as “natural” by the supplier, but finished product brands must hold a certificate from the supplier that states the components do not contain artificial flavors. Brands are obligated to produce such certifications upon regulatory demand. Brands must hold onto those records for an additional three years after the last supply is provided should FDA conduct an inspection. These certifications are often not considered or maintained as they should be.

The proper labeling of flavored products is not simple. Brands must know a great deal about the identification of a “natural flavor.”



As chief operating officer, Jim Lassiter oversees all consulting operations at [REJIMUS](#), formerly Ingredient Identity. He has more than four decades of experience in quality control (QC), and government and regulatory affairs throughout the pharmaceutical, dietary supplement and natural product industries with organizations such as Nutrilite, Robinson Pharma, Irwin Naturals, Chromadex, the American Herbal Products Association (AHPA) and the Council for Responsible Nutrition (CRN). A respected author and speaker, Lassiter has served on numerous industry and trade boards.



Colors and flavors go au natural ... and it's a good thing

by Judie Bizzozero

Making the artificial-to-natural switch is no walk in the park, especially when it comes to flavors and colors. While swapping synthetic colors and flavors for natural options requires attention, communication and a tolerance for repetition, going au natural is a good thing and fuels innovation in the growing clean label sector. Brands looking to bring products to market with natural colors and flavors need to consider the following factors impacting product innovation.

Understand formulation challenges. Natural colors are sensitive to pH and can experience fading due to heat during processing and light; therefore, product developers must choose natural colors that will maintain intensity throughout processing and shelf life. Despite these challenges, certain methods can protect the integrity of the product when formulating with these colors, such as masking agents and packaging with a UV barrier. Flavors also present unique challenges, especially when working with proteins and botanicals that can bring off-notes and bitterness. Long or harsh cooking processes also can cause flavors to break down.

Keep an eye on costs. Natural colors and flavors carry a higher price point than their synthetic counterparts, mainly due to sourcing and extraction costs. When deciding whether to go natural, brands must consider cost in use, especially for products that carry a low price point. What's more, going natural depends on Mother Nature, and supply chains can be disrupted by adverse weather conditions such as hurricanes, freeze and flooding.

Identify the whitespace. Colors and flavors are found in nearly every food and beverage product; however, a few categories are seeing increased use in natural alternatives. Consider the sparkling water category that's seeing tremendous innovation with unique flavors and flavor pairings. Many brands are marketing sparkling water as mocktails or low-calorie mixers to appeal to the growing base of consumers looking for unique flavor experiences with little or no calories or alcohol. Examples include LaCroix's Cubana, a mojito-inspired beverage that mingles fresh mint and tangy lime notes, and Petal Sparkling Botanicals' Lemongrass Dandelion and Peach Marigold beverages that incorporate antioxidant-rich botanical ingredients with natural flavors.





Are you more inclined to purchase a product that includes natural colors and flavors?

A.

I generally prefer to purchase products with natural colors and flavors because I want to consume ingredients that are processed from natural sources rather than artificial ones.

Carrie Freese
Sponsorship Manager,
Health & Nutrition

A.

Yes, if a product has a unique flavor and a vibrant color it will peak my interest, but it's most important to me that it contains natural ingredients.

Alyssa Sanchez
Education Manager,
Health & Nutrition



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