

Product Development Guide

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Nature's Colors

Creating inviting natural products that look as good as they taste!



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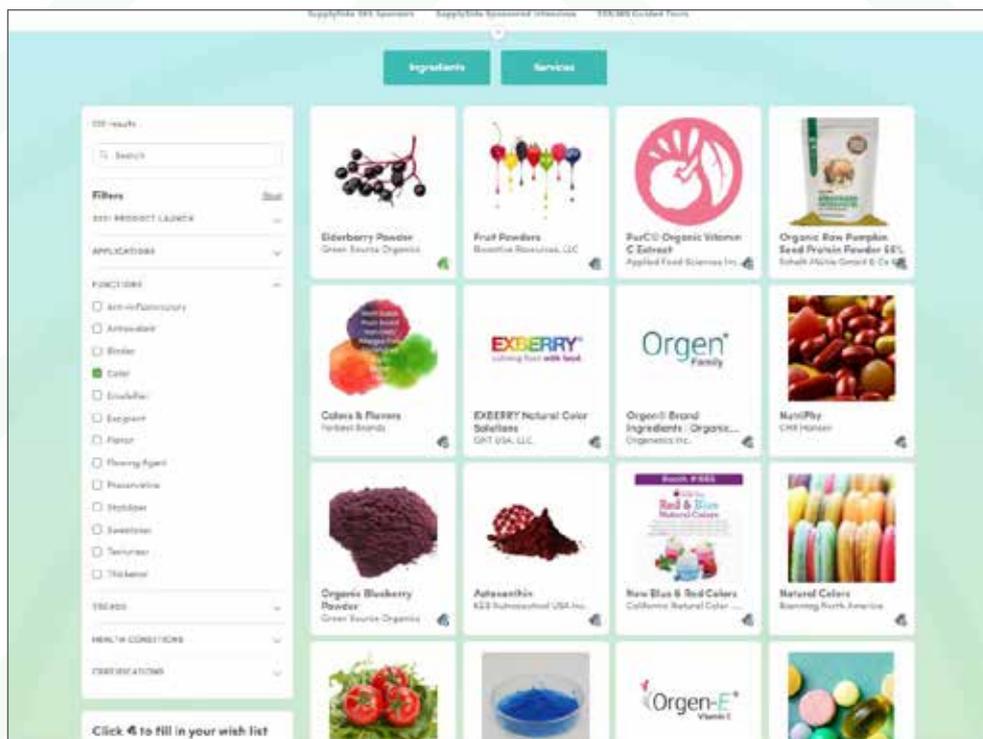
Food & Beverage Insider leads CPG brands from ideation through manufacturing, supporting the development of clean label, natural and healthy food and beverage products. FBI provides in-depth data and analysis of the markets and is the source for the latest on ingredients, formulation, supply chain and regulatory issues affecting product innovation. As an official content provider for SupplySide and Food Ingredients North America (FiNA), FBI connects ingredient buyers and suppliers with executives across the health and nutrition marketplace.



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Nature's Colors

Creating inviting natural products that look as good as they taste!

Evolving consumer understanding

Most food and beverage developers and brand owners know that when it comes to delivering a market-winning product, flavor is king. They realize that even when a product contains clean ingredients, is sourced sustainably and comes from a mission-driven company—all attributes that natural and organic, and increasingly mainstream shoppers care deeply about—if it doesn't taste delicious, it simply won't sell.

What may be less obvious, however, is that color plays a huge role in flavor and the overall sensory experience. Consumers may not be fully aware of these preferences, but wise formulators know that the way a food or beverage *looks* factors significantly into consumer preference and enjoyment experience, and can influence flavor perception—even though this assessment is often entirely subconscious. Therefore, color is arguably just as important as flavor for food and beverage formulators to get right.

This is precisely why conventional food and beverage brands have always added artificial dyes to products. Look no further than bright-green mint chocolate chip ice cream, magenta-tinted raspberry yogurt or the rainbow of kids' cereals at the supermarket—all are colored with synthetic dyes to increase their appeal. Even many salad dressings, canned fruits, processed breads, microwave popcorns and pickles (yes, pickles) are made with artificial colors. And because they have been for generations, many consumers are unaware of how these hues are achieved or that they are unnatural.

Natural and organic companies, on the other hand, have long eschewed artificial colors, knowing that their core consumers don't want them. In fact, synthetic food dyes were among the first food and beverage ingredients to catch consumers' attention as undesirable, with concerns about them causing increased hyperactivity in children first arising in the 1970s. Further research has linked certain synthetic food dyes with cancer and other health problems.

These troubling findings got conscious consumers wondering what was actually in these dyes. Indeed, food dyes stimulated curiosity and interest in understanding or avoiding other "mysterious" food ingredients with chemical-sounding names that were hard to pronounce. Even if these components weren't harmful, shoppers began questioning whether they were really necessary. They were totally OK with foods and beverages looking less brilliant if the tradeoff was having no potential hazard to their health—and better yet, offered benefits.

Natural colors move mainstream

Today, demand for foods and beverages made without artificial colors has moved mainstream. According to the International Food Information Council's (IFIC) 2021 Food & Health Survey, a whopping 35% of American adults now say they seek out products featuring natural colors. Perhaps it's no surprise then that Zion Market Research valued the global natural colors market at \$2.3 billion (USD) in 2020 and predicts it to punch \$3 billion by 2028, with a compound annual growth rate of 3.1%.

The heightened demand for natural colors dovetails with the larger clean-label trend. Consumers are increasingly looking for foods and beverages made entirely with natural ingredients—no artificial anything—plus any combination of health-halo attributes such as organic, non-GMO, allergen free, and simple, short ingredient decks.

According to IFIC's 2021 survey, an astounding 64% of Americans try to choose foods and beverages made with clean ingredients. And when asked how they define “clean,” respondents' top selection was “not artificial or synthetic,” beating out “organic,” “fresh,” “nutritious” and other common clean-label qualities. Also important to consumers in the clean-label equation are familiar, nonchemical-sounding and pronounceable ingredient names.

Today, food and beverage formulators and brand owners can hit all these marks by choosing high-quality natural color ingredients for their products.

Innovation for natural colors

Back in the day, natural and organic food and beverage developers didn't have many viable natural color ingredients to choose from. There were some available, but many were available only in limited formats, or they were difficult to formulate with or didn't maintain their integrity over time.

But perhaps the biggest drawback was that natural colors typically did not yield vibrant hues like consumers were accustomed to seeing from synthetic dyes. Because naturally colored foods and beverages looked dull in comparison, many shoppers automatically said no thanks.



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Fortunately, consumers have evolved in that respect. As concerns about artificial dyes mounted and more naturally colored foods and beverages were launched, shoppers started to view brilliant-hued products as, well, fake and therefore neither nutritious nor crave-worthy.

But there's even better news for formulators and brand owners: natural colorants have come a long way in recent years. Leading color houses and ingredient suppliers have developed a rainbow of options made from vegetables, fruits, flowers, roots and a range of other plant sources; some suppliers even offer custom color combinations. These ingredients even have easily pronounceable and understandable names that often reflect their source, making them very clean-label friendly.

What's more, many natural hues today are bright, deep, rich and exceptionally appetizing. They create highly photogenic foods and beverages, which is so important in this age of influencer marketing and everyday consumers posting food footage on Instagram, Snapchat and TikTok.

Today's top natural colors aren't just eye-catching, however. They also possess key technical attributes that boost their versatility and ensure formulation ease. For one thing, they are processed gently to retain the raw materials' natural coloring properties, without the use of harsh processing aids that would derail a clean label.

They also come in a variety of formats, such as liquids or crystals, to suit a wide array of applications, from ready-to-drink beverages to fruit chews to creamy dairy items to plant-based products. Properties such as excellent water or oil solubility can reduce the need for carriers or emulsifiers while resistance to heat or light degradation can ensure that natural color ingredients remain stable throughout an end product's shelf life.

Another factor that formulators and brand owners should bear in mind while evaluating their natural color options is transparency. Always work with suppliers that are open about their sourcing and have responsible, ethical practices in place. And when it comes to botanical raw materials, it is important that they can validate the plants' legitimacy to ensure that what's on the finished product label is actually what's inside the food or beverage. ♦

Color with exceptional solubility



LEARN MORE



PURTURMERIC™

organic turmeric extract by **AFS**

When 80% of our human connection is through the eyes, your product's color is critical.

PurTurmeric brightens the food experience with vibrant golden-orange color and on-trend flavor. Solubility is essential when formulating with organic turmeric. And PurTurmeric is the cleanest, most water-soluble powdered turmeric of its kind. Whether you're developing a brilliant colored beverage, functional food, or nutritional supplement, you will appreciate the ease and consistency of PurTurmeric. Now is the time to work with this functional, aromatic flavor. It is a must-try!



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Product Development Guide

Q&A



Company Name: Applied Food Sciences
 Contact: John Kathrein
 Title: National Sales Director

1 What specific ingredients do you offer to brands in food and beverage development wanting to create products with colors derived from nature?

PurTurmeric® brightens the food experience with vibrant golden-orange color and on-trend flavor. Solubility is essential when formulating with organic turmeric, and PurTurmeric® is the cleanest, most water-soluble powdered turmeric of its kind. Whether you're developing a brilliantly colored beverage, functional food, or nutritional supplement, you will appreciate the ease and consistency of PurTurmeric®. Now is the time to work with this functional, aromatic flavor. It is a must-try!

2 What unique benefits do your color and pigment ingredients offer to food and beverage manufacturers? Are there any Nutritional benefits? Clean Label?

PurTurmeric® is unlike any turmeric. Its excellent solubility highlights the unique features of this ingredient without the need for carriers or the addition of emulsifiers. PurTurmeric® is also Non-GMO Project Verified and USDA Organic Certified.

3 What are some applications for this ingredient(s)? How could food and beverage manufacturers apply your solutions to meet changing consumer demands?

PurTurmeric® is ideal for beverages, functional foods, and nutritional supplements where solubility is necessary. From stick packs to shots to functional juices, PurTurmeric® brightens any food or beverage.

4 Do your ingredient solutions have a particular supply chain story or special certifications?

The battle against adulteration is a challenge for the entire natural products industry. Trust and transparency are essential to the future success of turmeric and curcumin-based products. As a proud member of the American Botanical Council (ABC) and their continued efforts to educate the industry, AFS has taken numerous steps supported by ABC's experts to ensure high-quality turmeric in the marketplace. To certify 100% turmeric in AFS's curcumin extracts, the company has developed a multistep approach incorporating USP and AOAC validated methods for specific compound identification. In addition, AFS conducts isotope testing to ensure no synthetic substances have been introduced in the raw material.

The background of the advertisement features two glasses of sparkling beverages. The glass in the foreground is filled with a pinkish-red liquid, garnished with several blueberries and a slice of orange. The glass behind it is filled with a similar liquid, garnished with a slice of orange and what appears to be a slice of watermelon. The background is softly blurred, showing a white tablecloth, a small vase with yellow flowers, and a bowl of strawberries.

Zero Sugar Added Natural Color!

Our Natural Crystal Colors provide color without adding sugar or calories. Making our colors the perfect solution for manufacturers looking to reduce sugar in their products.

*Sparkling beverages colored
with our natural colors*



California
NATURAL COLOR

CONTACT US TODAY *for more information or to request a sample*
800.557.0220 • inquiries@californianaturalcolor.com
5631 E. Olive Ave., Fresno, CA 93727 • californianaturalcolor.com



Product Development Guide

Q&A



Company Name: California Natural Color
 Contact: Cori Satkowski
 Title: Manager: Color Technology

1 What specific ingredients do you offer to brands in food and beverage development wanting to create products with colors derived from nature?

California Natural Color offers a wide selection of liquid and crystal colors derived from fruits, vegetables, and other natural sources. Our colors are OU Kosher, Halal, non-GMO, organic compliant, and allergen free. We are excited to announce that we have non-GMO Project Verified and Organic Certified options available. We also offer grape juice concentrate and grape seed extracts.

2 What unique benefits do your color and pigment ingredients offer to food and beverage manufacturers? Are there any Nutritional benefits? Clean Label?

Through our unique crystal technology, we offer highly concentrated colors that are easy to work with and align with the growing demand for clean label and sugar reduction. Our pure, carrier-free crystal colors are produced from natural sources, allowing our customers the benefit of a clean, no sugar added, and calorie-free label. They are also less dusty compared to spray dried colors, have a five-year shelf life, and do not require refrigerated shipping or storage. We carefully select our natural raw materials to ensure optimal stability for our colors. For example, our grape-derived crystal colors are produced from the Rubired grape varietal, which is unique to California. It has a complex molecular structure that enhances color stability compared to other fruit options. This makes it the most stable red fruit color available.

3 What are some applications for this ingredient(s)? How could food and beverage manufacturers apply your solutions to meet changing consumer demands?

In today's world, consumers are looking for products that are considered healthy, have ingredients they can recognize, and

ultimately, look good. Our colors can be used to help meet consumers' expectations of flavor, quality, and healthiness. They are made from sources that are recognizable and can be used in just about everything, from gelatin vitamins to hard candy and from sparkling juices to baked goods. Since our pure crystal colors are carrier free and highly concentrated, they provide color without adding sugar or calories. This makes them the perfect solution for food and beverage manufacturers looking to reduce sugar in their products or create low- or zero- calorie labels while maintaining a clean label. Our team of technical experts can assist with product formulation, stability testing, and creating custom natural colors to help meet changing consumer demands.

4 Do your ingredient solutions have a particular supply chain story or special certifications?

At California Natural Color, we understand the importance of a sustainable and reliable supply chain. For example, our grape colors start from grapes in our vineyards and are made into primary products like concentrate, color, wine, and brandy. Byproducts are made into grape seed extracts, oils, pure alcohol, and energy to run our facility. Any remaining solids are used to produce cattle feed. The cattle feed then leads to fertilizer that is put back into the vineyards to help produce more grapes. Additionally, for all our colors, we have developed a strategic supply of raw materials and make products that can benefit your supply chain. Our crystal colors are five times more concentrated than their liquid counterparts, which means you ship and store five times less. They do not require frozen shipping or storage and no staging time is needed. This can help reduce freight costs and energy usage.

Oterra™

Because the world
deserves more
naturally colored food

And we're here to help.

www.oterra.com





Product Development Guide

Q&A



Company Name: Oterra
 Contact: Tammi Geiger
 Title: Regional marketing manager, North America

1 What specific ingredients do you offer to brands in food and beverage development wanting to create products with colors derived from nature?

Oterra is the largest provider of naturally sourced colors worldwide. We offer a full palette of colors from all the raw materials typically used. Contrary to artificial colors, which are almost indestructible, natural colors come mainly from plants and need to be handled carefully in order to maintain their coloring properties. So even though there are only about 30 raw materials from which natural food dyes are made, we offer over 1,000 products. This is because the colors need to be formulated for specific applications, for example to be able to withstand heat or to not degrade in light. Another example would be to make naturally oil soluble colors water dispersible and vice versa.

2 What unique benefits do your color and pigment ingredients offer to food and beverage manufacturers? Are there any Nutritional benefits? Clean Label?

In addition to producing color formulations that can be used in all applications, we also produce ranges for all levels of naturalness. Our customers know what kind of ingredients their consumers are looking for. As an example, we might offer two versions of nearly the same product where one would contain lemon juice, and the other citric acid. Lemon juice and citric acid have the exact same molecular structure, but citric acid is made by a fermentation process and is substantially less expensive than lemon juice. That way, our customers can achieve the exact cost/value ratio their consumers are looking for.

While it would be inappropriate to make nutritional claims for a natural color, our clean label FruitMax® colors contain the same characteristics as the vegetable from which they come. So, a color from carrot would have the same ratio of sugars, fibers, pro-vitamin A, etc. that are in carrot juice, just in a concentrated version.

For the dietary supplement industry, we also offer a line of phytonutrients from grape polyphenols, cranberry, bilberry and blackcurrant to name a few. The health benefits of these raw materials have been widely researched and our NutriPhy® products are very high quality.

3 What are some applications for this ingredient(s)? How could food and beverage manufacturers apply your solutions to meet changing consumer demands?

Our products are suitable for every application in food and beverage, as well as dietary supplements and even pet food. As the largest supplier, we strive to offer natural colors in every shade, for every application and every level of naturalness. This makes us a great partner for our manufacturing customers, as they can get both products and support no matter where they and their consumers are in their journey towards natural.

4 Do your ingredient solutions have a particular supply chain story or special certifications?

Our products are certified non-GMO, kosher and halal.

We are front runners in non-GMO plant breeding, where we have long-running projects to breed crops with, for example, a higher color content or shorter growth cycle, thereby reducing our agricultural footprint. The solids from the raw materials of our production are always valorized in some way, often being used as animal feed. Sometimes we use waste product to create color, as is the case in utilizing red grape skins which have been discarded after pressing for juice.

As a company, we have always believed that natural is best and that we should take care of our planet. In addition to everything we do with our raw materials, we have long been setting successful goals to reduce our use of water and power during production.