



OVERCOMING THE CHALLENGES OF USING NATURAL COLORS

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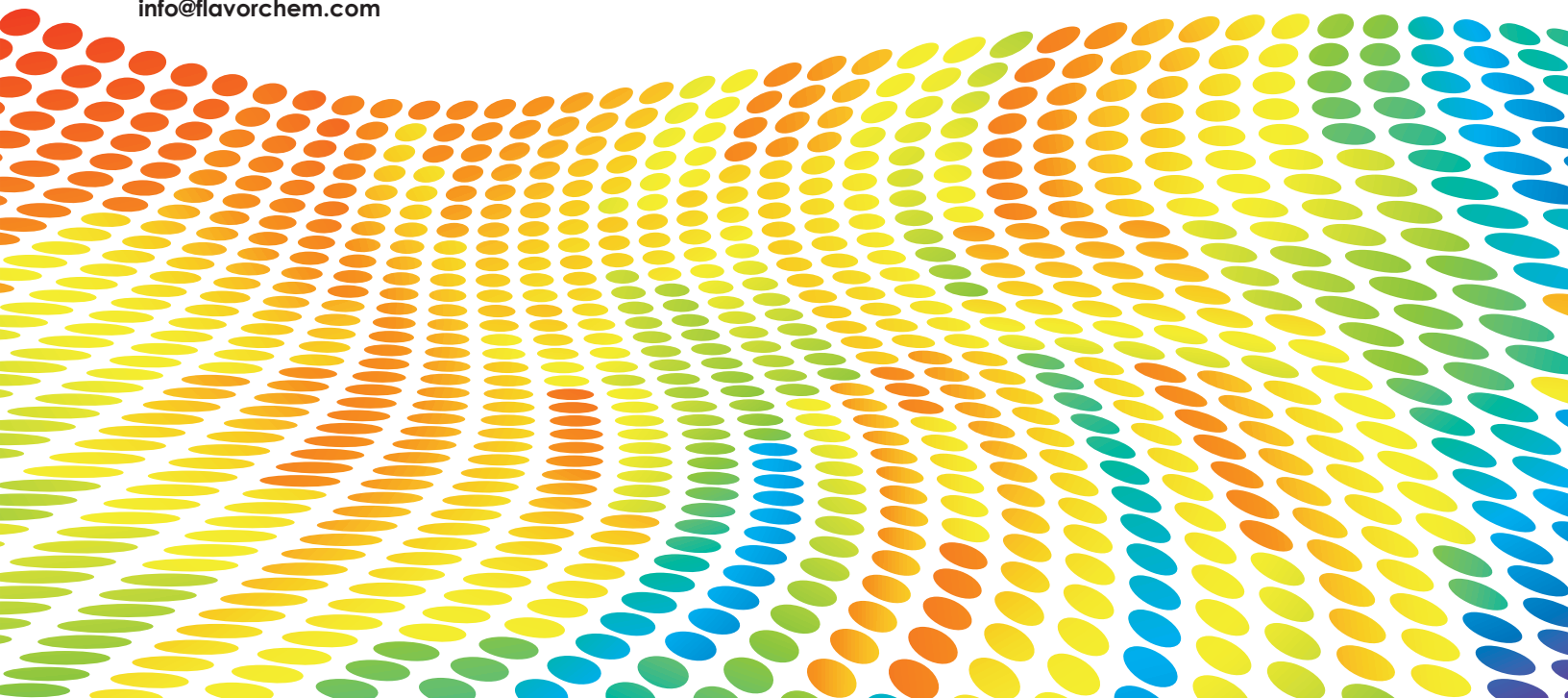
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Overcoming the Challenges of Using Natural Colors

Natural color blends can be challenging to formulate and equally difficult to work with. Natural colors are typically less stable, more expensive, not as bright, and weaker in strength than synthetic dyes. Stability is affected by the interaction of temperature, light, pH, water, and presence of oxygen. Some important questions to consider when using natural colors:

- What type of product is the color going into?
- What form of color is desired – powder or liquid?
- Should the color be oil soluble or water soluble?
- What is the pH of the finished product(s)?
- Will the finished product be subjected to heat?
- Is the product packaging opaque or clear? Will the product be exposed to light?
- What is the desired shelf life of the product? How will it be stored?
- Will the product require kosher or halal certification?
- In what country will the finished product be sold?

Components of the finished product (pH, packaging, storage method, etc.) have a significant impact on which natural color can be successfully used. Anthocyanin-based colorants, for example, are highly sensitive to pH. At a neutral pH, they tend to be blue in color and not very stable but as the pH level becomes more acidic, they turn red and pink and become more stable. Depending on the colorant used, heat and light can degrade the colors.

Most annatto colors will precipitate at a pH less than 4 and free calcium cations will interact with and change the color from orange to pink. This is an especially important consideration when using annatto in dairy products. It is imperative that all natural color blend samples be thoroughly evaluated in the system for which they are being used.

The FDA does not recognize a colorant as natural unless it is derived from the characterizing source. For instance, using strawberry juice as a colorant in strawberry ice cream would be considered natural whereas using beet juice for the same purpose would not be.



Different hues pose their own unique processing challenges which extend beyond the general challenges associated with natural colors:

Pink or Red: Because most red colors are anthocyanin-based, achieving a red or pink color for a neutral pH based product (such as icing) is difficult. Carmine, derived from insects, can deliver a very nice pink/red color at a neutral pH but is not Kosher. Beet juice is can be used in products such as ice cream but is not appropriate for products that are exposed to heat or light. Other options for a pink or red shade include red cabbage, purple or black carrot, elderberry, radish, and lycopene.

Yellow: The most common colorants are turmeric and beta carotene. Turmeric delivers a bright yellow color but is highly photosensitive. Beta carotene is slightly more orange than turmeric and is also sensitive to light. Saffron is more stable to light.

Orange: Annatto, Paprika, and Beta Carotene are the most commonly used colorants and possess good heat stability.

Green: Alfalfa and spinach-based colorants are available but their use is application-dependent.

Brown: Caramel color comes in Class 1, 2, 3 or 4 and its acceptance depends on the manufacturer's definition of natural. Class 1 is regarded as the most natural as it has no ammonia or sulfite reactants. Caramel color has excellent light and heat stability.

Blue: The few colorants available are not very stable and often very expensive.

Despite the challenges of working around processing parameters, successfully coloring foods and beverages with natural colorants is possible. Call (800-4-FLAVOR) or email (info@flavorchem.com) Flavorchem to learn more about the natural color solutions we can provide for your products.

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