

Functional beverages—like energy and nutraceutical drinks—are growing in popularity among consumers who need a boost of energy, add more vitamins and minerals to their diets, or address specific health concerns. Based on a recent report from Transparency Market Research, “Global market for functional drinks is observing a healthy rise in its valuation, thanks to increasing awareness about the benefits of functional drinks on health and wellness.”¹ As a result, many beverage manufacturers are both introducing new products and altering existing products to align with changing consumer habits. However, as brands change their recipes to meet functional demands, they must consider the impact of color change and its effect on consumer perception.

The ingredients in functional beverages, as well as the carbonation, can change the overall color of the drinks. Even beverage manufacturers that create translucent products need to consider the impact of color. For example, if a consumer is expecting a clear product, they may be turned off if the product appears cloudy or murky, which can be an indication of impurities. Spectrophotometric technology can be used to ensure your beverage’s color and haze remains consistent even as recipes change.

Issues Impacting Beverage Color and Haze

Through 2021, U.S. demand for natural colors in beverages and food is expected to rise by 7.1%.² As today’s consumers are turning toward functional beverages and demanding products fewer artificial, sugary ingredients, manufacturers will have to closely monitor the impact of formulation changes on the color and haze of their products; any change in your beverage manufacturing process can impact the appearance of the end product. This includes:

- **Carbonation changes:** Carbonation can impact the color of a beverage, as it incorporates more air and will alter the darkness of the base mix. Beverages with more carbonation may appear lighter in color, but murkier when it comes to clarity.
- **Natural ingredient color fluctuation:** Unlike artificial color additives, natural ingredients are often not uniform in color. As such, when using natural ingredients to color a product, fluctuations in the ripeness or natural color of the ingredient can create fluctuations in the end product from batch to batch.
- **Alternative sweeteners:** Standard sugar tends to have a crystalline structure, which may dissolve more clearly than artificially created sugars with more powdery structures. As manufacturers move away from standard sugars to sugar alternatives, the clarity of their drinks will change. Additionally, natural, unprocessed sugars will be brown, while processed sugar is stark white in appearance.³ This will impact the darkness or lightness of the end product.
- **Water purity:** The base of any beverage is water, and the underlying purity of that water will change the result. Manufacturers that choose to work with distilled or demineralized water, for example, start from a clearer base than those who choose natural spring waters which have not had the minerals removed.

Brands may already have an end color in mind during the production process, but changes in that process can take them away from that goal color. To ensure your color remains the same even as your recipe changes, you should consider implementing quality control protocols that measure both color and haze in your products.

Spectrophotometers Help Perfect Color and Haze in Functional Beverages

Consumers who choose functional beverages tend to be discerning when it comes to their drinks, both in terms of the function itself and the overall appearance of the product. As such, beverage manufacturers must contend with dual issues in product color management: you must consider both the hue of your product as well as how clear or cloudy that product is. While these issues are critical at all production scales, they can be

particularly difficult to pinpoint when products are being manufactured in large batches. This is where spectrophotometers can be used to simplify the process.

Spectrophotometers allow you to establish a target color for your beverages based on existing products or new aesthetic parameters. By comparing new formulations to your personal color standard, you can ensure that every batch falls within your color tolerance range. This data can not only ensure that every product you release has the hue you want, but can help you fine-tune your formula by correlating ingredients and process variables with color. Additionally, in transparent and translucent products, spectrophotometers may be used to measure haze, helping you establish and adhere to clarity expectations.

Color and haze have historically had to be measured separately, even if measured with the same instrument, potentially making the quality control process laborious and time-consuming. HunterLab's [Vista spectrophotometer](#), however, is specifically designed to measure transmission color and haze simultaneously. With simultaneous sample measurement, you minimize both sample preparation time and product waste, dramatically increasing the efficiency of your color quality control process. In addition to its measurement capabilities, the Vista comes with the EasyMatch Essentials color measurement software which features multiple data views, a touchscreen display with customizable workspaces, and a comprehensive range of color and haze scales and indices. This allows operators to easily capture and analyze color and haze data with the highest level of accuracy and precision. A spill-resistant sample compartment and small footprint mean the Vista can be integrated into virtually any environment.

When you're creating new products or updating existing formulas to connect with consumers demanding more functional beverages, color and haze must be at the forefront of the product development process to ensure appeal to consumers. Through objective color measurement, you can ensure your product remains visually appealing while meeting consumers demand for functionality.

Full article with photos available here:

<https://www.hunterlab.com/blog/color-food-industry/measuring-color-and-haze-in-functional-beverages-essential-product-appeal/>