



Haze measurement is critical to ensuring that teas maintain visual appeal and optimal health benefits.

Image Source: Unsplash user bady qb

Tea is the most universal of prepared beverages, spanning both time and geography. From the common breakfast tea available your local supermarket to the most delicate white teas to the earthy and mysterious Pu'er, teas come in a range of kinds and flavors to suit virtually any palette. But tea isn't just a tasty drink; the medicinal properties of tea are the stuff of legend and play a vital role in virtually of the myths surrounding tea's origins. As such, tea has been an instrumental part of traditional medical practices for thousands of years.

Now, modern medicinal research is confirming many of the health-promoting benefits tea is said to imbue. "The evidence supporting the health benefits of tea drinking grows stronger with each new study that is published in scientific literature," write the authors of one metareview published in *Current Pharmaceutical Design*.<sup>1</sup> These benefits include everything from cancer and heart disease prevention to enhancing metabolism and encouraging weight loss to anti-aging, antidiabetic, and antimicrobial properties.<sup>2</sup> "There doesn't seem to be a downside to tea," says Katherine Tallmadge, spokeswoman for the American Dietetic Association. "It's pretty well established that the compounds in tea—their flavonoids—are good for the heart and may reduce cancer."

As evidence of the health-promoting qualities of tea mounts, ready-to-drink teas have grown exponentially in popularity both in the United States and around the world. In 2014, the ready-to-drink tea market ballooned to \$5.3 billion in the US alone and \$50 billion globally and experts predict that the market will continue to grow by 6% annually until 2018. With demand rapidly expanding, mass market major players such as PepsiCo and Coca-Cola are being joined by upscale, artisanal suppliers offering up gourmet ready-to-drink products.<sup>3</sup> At a time when the public is seeking to replace coffee, soda, and highly processed fruit juices with healthier options, these products offer a convenient and attractive alternative.

But ready-to-drink teas are often plagued by a serious downfall: haze. In order to ensure that tea products maintain visual appeal to consumers and preserve their health benefits, tea manufacturers

must implement tight quality control protocols that include haze measurement to address the challenges presented by haze formation.

#### The Health Implications of Haze Formation

The flavonoids that impart tea's health benefits are part of a larger class [of chemical compounds called polyphenols](#), which serve as an abundant source of micronutrients. When these polyphenols interact with other compounds present in tea, however, the results can be undesirable. As Wu and Bird write in the *Journal of Food Process Engineering*, "[P]olyphenols tend to interact with proteins, caffeine, and metal cations to form colloidal suspensions of haze and 'tea cream', which are detrimental to product appearance and taste.<sup>4</sup> While [haze formation can affect color and impair aesthetic appeal](#), it can also diminish both the shelf-life and the health-promoting properties of the tea.

Traditionally, tea cream and haze are removed using processes such as heating, pH adjustment and stabilizing additives, many of which reduce polyphenol content to achieve haze reduction. In 2011, for example, a new stabilizing enzyme was released that works in part by removing polyphenols from tea extract to avoid precipitate formation without affecting the flavor of the tea.<sup>5</sup> However, researchers are now developing more sophisticated methods of haze removal that seek to minimize polyphenol content loss to optimize health benefits while simultaneously preventing color and flavor changes that interfere with product appeal. Although research is ongoing, microfiltration is currently one of the most promising haze removal methods that aims to balance stability with key polyphenol levels.<sup>6</sup>

[https://youtu.be/KuYwQL3q6\\_Q](https://youtu.be/KuYwQL3q6_Q)

#### Using Haze Measurement To Perfect Tea Formulation

Of course, the implications of haze formation go beyond the chemical composition of the tea. Regardless of the actual quality of a tea, researcher KJ Siebert says that haze can leave consumers with a poor impression:

Hazy products are often regarded as defective and perhaps even potentially harmful. Since consumers are usually more certain of what they perceive visually than of what they taste or smell, the development of haze in a clear product can reduce the likelihood of repeat purchasing of a product and can have serious economic consequences to a producer.<sup>7</sup>

As such, haze measurement is a critical part of overall quality control protocols for ready-to-drink tea manufacturers. But haze is only one factor at play; [tea color is also an essential element](#) to ensuring optimal visual appeal and marketability.

Traditionally, haze and color have been measured separately, often requiring two different instruments and doubling the amount of time and labor involved in the quality control process. [HunterLab's new spectrophotometer, Vista](#), however, eliminates the need for two separate instruments and even two separate measurements. This remarkable benchtop spectrophotometer combines the finest [transmission color measurement](#) with simultaneous haze measurement, allowing you to easily distill [color and appearance information](#) to objective, quantifiable data at the touch of a button. Paired with our powerful Essentials software, Vista provides everything you need to gain a complete picture of ready-to-drink tea quality and behavior. While Vista is ideal monitoring color and haze in existing products to ensure adherence to your established standards, it is also the perfect tool for assessing new production variables and processes, including haze removal.

## HunterLab Innovation

At HunterLab, we are committed to providing innovative solutions to color and haze measurement challenges by combining the most cutting-edge technologies with smart, user-friendly designs. Our comprehensive range of portable, benchtop, and in-line spectrophotometers has been developed in response to the diverse needs of our customers and is renowned across industries for its state-of-the-art engineering and ease of use. All of our spectrophotometers come paired with sophisticated software packages that give you unprecedented flexibility to collect, display, analyze, and share product data, opening up the door for extraordinary quality insight and control. [Contact us](#) to learn more about our spectrophotometric instruments, customizable software packages, and world-class customer support services.

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