



The color of fish tells us a story about its freshness and safety.

Image Source: Pexels user stock.tookapic.com

Humans have evolved as highly visual creatures, using color as one of the most important signifiers of safety. From a red stop light to a brightly colored snake, color acts as an instant and instinctual visual alarm bell warning us of potential dangers. This use of color as an indicator of safety is perhaps most clearly evidenced by the act of pulling out a piece of fish from the refrigerator and asking, “Does this look okay to you?”

Unlike many color/perception relationships, the one between fish color and food safety is relatively linear; although even experts may not be able to distinguish between white and red wines in blind taste tests, you can be pretty sure that if a fish looks bad, it is bad. The color change itself is an indicator of a specific sequence of biological events and the process begins almost immediately following death. As Nollet and Foldra point out in the *Handbook of Seafood and Seafood Product Analysis*

The appearance of a newly landed fish is unforgettable, in that the interplay of subtle shades of beautiful colors make it a joy to behold and irresistible as an item of food. Just a few hours after death, though, it begins to look less obviously attractive, and its now ‘ordinary’ colors are much more familiar to the majority of the public.¹

Just as familiar is the look of spoiled fish product: dull, lifeless, decaying, and carrying the potential for food poisoning.

But the determination of fish freshness isn’t just up to individual consumers; the seafood industry as a whole must take great care to [assess the quality and safety](#) of products throughout the supply chain, particularly at a time when [traceability is a growing concern](#).



Spectrophotometric instrumentation provide an objective basis for the determination of fish freshness.

Image Source: Pexels user Steyn Viljoen

Instrumental Determination of Fish Freshness

Because the color of fish acts as a relatively predictable indicator of freshness, instrumental color analysis offers a simple, economical, and rapid method of reliable quality assurance. By replacing [subjective human vision](#), which is prone to a host of biological and environmental vulnerabilities, instrumental color analysis provides a clear and stable basis of assessment that ensure fish is evaluated the same way every time, regardless of operator skill or location. The sophisticated color measurement capabilities of modern spectrophotometers make them ideally suited to objectively assess fish freshness at key points in the supply chain, from raw product to minced, dried, cooked, or otherwise processed fish. Not only does this allow you to evaluate the quality of fish and fish products for the safety of the public, but it also allows you an objective way to identify potential mishandling either within your own facility or by your suppliers and take swift action to correct the issue.²



Selecting the right spectrophotometer is essential to ensuring accurate color measurement of fish.
Image Source: Pexels user Nguyễn Linh

Choosing the Right Spectrophotometer

Fish, however, present several unique physical qualities that make the choice of spectrophotometer particularly critical to obtaining accurate, repeatable measurements. First, the color of fresh fish is rarely homogenous, but rather intricately variable. As such, a single measurement may not provide a complete picture of fish freshness. Selecting an instrument that can take multiple measurements in rapid succession and average the results is vital to ensuring that the color values truly represent the sample as a whole. Fish and fish products may also be textured and require labor-intensive sample preparation using outdated spectrophotometric instruments. Choosing a spectrophotometer with [integrated height measurement](#) eliminates the need for this sample preparation because it automatically accounts for height variation, eliminating the risk of operator error and saving valuable time.

At HunterLab, we have been pioneers in color measurement for over 60 years. Today, we offer a comprehensive lineup of portable, benchtop, and inline spectrophotometers designed to address the complex color measurement challenges faced by our customers across industries. Our dedication to innovation and technological excellence allows us to offer smart solutions for the needs of the fish industry, providing the highest level of quality assurance and giving you the ability to protect both consumer health and your brand. [Contact us](#) to learn more about our renowned spectrophotometers, customizable software packages, and world-class customer service, and let us help you select the perfect tools for your needs.

1. "Handbook of Seafood and Seafood Product Analysis," November 24, 2009, https://books.google.ca/books/about/Handbook_of_Seafood_and_Seafood_Products.html?id=LfXHWtGvRj8C&redir_esc=y

2. "From Ocean to Plate: Ensuring Traceable Supply Chain in the Seafood Industry," May 17, 2016, <http://www.foodsafetymagazine.com/enewsletter/from-ocean-to-plate-ensuring-traceable-supply-chain-in-the-seafood-industry/>