



Using the LOVIBOND® color scale, you can ensure that your liquid egg product is high in quality.
Image source: Pixabay user Pexels

An estimated 31 million people in the United States skip breakfast each morning, in part because the preparation process takes too long.¹ Busy work schedules and hectic morning routines make cooking a full meal very difficult—millions of people don't have time to carefully crack open an egg and fry it to perfection every day. This is where liquid egg products thrive. Unlike whole eggs, liquid eggs are more convenient for consumers to use every morning because there's virtually no cleanup required. Consumers simply pour the egg product straight out of a carton into a hot pan and within minutes they have a healthy, protein-packed breakfast prepared.

But as with most [perishable food products](#), liquid egg manufacturers need to make safety their first priority. A poorly-made product could easily make consumers ill. In addition, liquid egg manufacturers need to ensure that their products taste and look just as great as a fresh farm egg. By following the LOVIBOND® color scale, you can achieve perfection from every yolk and egg white, earning you a stellar reputation in the food industry.

A Complicated Pasteurization Process

The pasteurization process for liquid eggs is far more strict and complex than it is for whole eggs. To start, liquid egg companies need to clean and split the eggshells in half, removing both the egg whites and yolks from the shells. Next, companies are required to pasteurize the whites and yolks separately, even if the company plans on combining the two in the final product later. The liquid eggs are exposed to high heat and turbulence—the 148-degree Fahrenheit temperatures kill salmonella bacteria while the added turbulence preserves the texture of the egg and prevents it from coagulating.² Once this is done, both the egg whites and the yolks should be safe to eat and can be combined into the final product. However, even if you have the correct pasteurization measures

in place, it's still essential to test your product for bacteria and overall quality during the making of each batch. This is where the LOVIBOND® color scale can help.



In order to properly pasteurize raw eggs, manufacturers need to heat the ingredients and use a LOVIBOND® scale to determine whether the product received enough heat. Image source: Wikimedia user Manodegloria

How to Use the LOVIBOND® Color Scale

Although the LOVIBOND®-tested pasteurization process was used for the first time more than 50 years ago, it's still considered an effective method for measuring liquid egg product quality today.³ Most liquid egg factories have a LOVIBOND® color comparator or a spectrophotometer on-site to test whether a liquid egg product was adequately pasteurized. After going through the pasteurization process, manufacturers place a sample of egg into a trichloroacetic acid solution. Lab technicians then add water to this mixture and filter out the solid particles. This filtrate is added to a small solution of iodine inside of a test tube. If the color of the solution turns a blue-violet color,

then the egg has been pasteurized completely. If the color differs from this very specific hue, then it's a sign that the batch has potentially dangerous contaminants or bacteria.

But how can you tell whether your solution is the perfect shade of blue-violet? You can't use your naked eye since this leaves room for serious error. You may think you see the perfect hue when in reality the solution is slightly off in color. Alternatively, you may think that a solution isn't blue-violet enough, causing you to throw out a batch of perfectly-safe product.

When it comes to getting the most accurate measurement possible, you need to use a LOVIBOND® color comparator or a spectrophotometer capable of measuring colors according to the LOVIBOND® scale. In this case, a spectrophotometer may be preferable to a comparator because this instrument offers you greater flexibility. Some spectrophotometers measure liquid and solid samples, allowing you to test more than one type of product without the need for additional equipment. However, even if you only plan on testing liquid products, some spectrophotometers are also more accurate than comparators and allow you to do additional testing such as color and haze analysis.

Regardless of which instrument you decide to use, you can use the LOVIBOND® color scale to test your liquid egg sample for proper pasteurization. Using a thin sample cell of the solution, you can tell whether your liquid egg reaches a 3 on the scale. Any solution below a measurement of 3 is likely [not pasteurized completely](#) and will need to be thrown away.



Consumers want liquid egg products to look identical to freshly-cracked eggs. Image source: Pixabay user fuji01

Choose the Right Ingredients for Your Product

Beyond helping you with the pasteurization process, spectrophotometric color measurement can also ensure that your liquid eggs are aesthetically pleasing. Even if your eggs are perfectly safe and

healthy, if they appear too milky in color when poured out of the carton, your consumers may find this off-putting. This is one of the greatest marketing challenges for liquid egg companies. Most consumers are used to the colors and textures of whole egg and, because liquid eggs come straight out of a man-made carton, it can be difficult to get your customers to trust in your product. In order to attract consumers, you need to analyze the color and haze of your ingredients and your final liquid product.

When you first buy whole eggs, it's important to check a sample of your source's eggs to ensure freshness. Generally, the whites of the eggs should be either clear or cloudy white.⁴ The cloudier and whiter the egg whites are, the fresher and healthier the egg is. A clear egg is still safe to eat and use, however, this is a sign that the egg is slightly older than its cloudier peers. If the whites look pink, the egg may be spoiled.

You can test this using a spectrophotometer like the [HunterLab Vista](#) since it's capable of measuring [both haze and color in liquid products simultaneously](#). Additionally, you'll want to test the egg yolk color using a spectrophotometer. Light yellow yolks are a sign of a chicken that eats wheat and barley, whereas darker yellow yolks come from hens who eat more corn and alfalfa. Your customers may have a preference for darker yolks, and you'll want to [test for this in advance](#). Once your final product is pasteurized, and you've mixed your egg whites into your yolks, you'll want to measure the product once more to test for consistency. By the end of the process, you should have a smooth golden-colored liquid without any discoloration.

HunterLab Reliability

If you want advice on the best spectrophotometer to use in your liquid egg factory, [contact HunterLab](#) today. We have a number of spectrophotometers available that are designed to meet the specific and exacting needs of the food industry. Because our equipment uses [the most accurate color measurement software available](#), including LOVIBOND® colors, we're able to help our clients become more efficient and trusted in their respective industries. Our experts will walk you through the selection and installation process for your new spectrophotometer and offer you tips on how to use this equipment to your advantage. With our expertise on your side, you'll create a liquid egg product that's indistinguishable from a freshly-cracked, farmer's market egg.

1. "31 Million Americans Skip Breakfast Each Day", December 11, 2011, https://www.huffingtonpost.com/2011/10/11/31-million-americans-skip_n_1005076.html
2. "Laboratory Determination of the Destruction of A-Amylase and Salmonellae in Whole Egg", September 25, 1961, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2134410/pdf/jhyg00124-0019.pdf>
3. "Alpha Amylase Activity in Liquid Egg", 2016, <http://www.lovibondcolour.com/colour-scale/alpha-amylase-activity-in-liquid-egg>
4. "The Five Things You Need to Know About Eggs", December 27, 2006, <https://www.today.com/food/5-things-you-need-know-about-eggs-2D80556370>