



# Honey Color

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## **What is the typical color of honey?**

Honey is classified by the U.S. Department of Agriculture into seven color categories: water white, extra white, white, extra light amber, light amber, amber and dark amber.

Please see the U.S. Standards for Grades of Extracted Honey<sup>1</sup> for more information.

## **What is the Pfund scale?**

The Pfund color grader is a device used by the honey industry. It provides continuous readings over the entire color range of honey. The Pfund color grader visually compares a standard amber-colored glass wedge with liquid honey contained in a wedge-shaped cell. The color intensity of the honey is expressed as a distance (in mm) along the amber wedge and usually ranges between 1 and 140 mm.

Equivalences between color names, Pfund readings and optical density are presented in the brochure “Honey, from nature’s food industry.” The Pfund color grader is inexpensive and convenient to use but readings may vary from one instrument to another.

## **Are there other methods to measure color?**

Yes, the color of honey can be assessed by a number of other methods. For example, the method adopted by the Association of Official Analytical Chemists uses a Lovibond 2000 visual comparator.<sup>2,3</sup> Studies have also shown that honey color can be assessed by the CIE-1931 or the more recent CIE-1976 (L\*a\*b) or CIELAB methods.<sup>4</sup>

Satisfactory results will be obtained with any of the instruments if used accurately and consistently.

## **Is honey color an index of its quality?**

No. Color is not included in the current USDA grading methods.

However, color is an important characteristic of upon which honey is classified by honey producers, packers and end-users. An estimated 75% of industrial users of honey include color designations in their specifications.<sup>5</sup>

## **What makes honey light or dark?**

The color of honey is characteristic of its floral source due to minerals and other minor components. Exposure to heat and storage time may affect honey’s color.

Honey appears lighter in color after it has granulated. The color of a specific sample of honey after it granulates depends

on the crystal size. The final crystals give the lightest appearance. For this reason, most creamed honeys are opaque and light in color.

### **Does honey color change over time?**

Honey can become darker as a result of storage, although at widely differing rates. This depends upon the composition of the honey (acidity, nitrogen, and fructose contents) and its initial color. Generally, the darkening of honey is temperature sensitive and occurs more rapidly when honey is stored at high temperatures.

### **What is the relationship between color and flavor?**

Generally, lighter honeys have a milder flavor and darker honeys have a more robust flavor. Even though many exceptions exist (for example, basswood is light in color but has a strong flavor; tulip poplar honey is dark-colored and mild tasting), color is used throughout the industry as a convenient measure of flavor and aroma. Please contact your supplier for more information on specific floral sources and blends.

### **Can honey be used as a coloring agent?**

Yes, in some product applications. For example, research has shown that using dark honeys in breads at levels higher than 8% (flour basis) can contribute to crumb and crust darkening, a desirable attribute for

multigrain and other variety breads.<sup>5</sup>

Honey is also used to contribute a golden hue to many sauces and dressings, fruit beverages, glazes, spreads and jellies, frozen desserts, baked goods and low-fat snacks.

Honey can also be used to promote surface browning of baked, roasted, cooked and extruded products.

Manufacturers who do not wish to take advantage of the coloring function of honey can simply select water white, extra white and white honeys. However, like all ingredients rich in reducing sugars, honey will contribute some color when exposed to heat in acidic conditions and will function as a browning agent when used at high levels in baked or cooked products.

### **What is the effect of microwave cooking on honey color?**

Honey is used in the food manufacturing industry as a browning agent in food products which are microwaved. Honey is a good source of Maillard reaction precursors and a highly reactive ingredient in microwave applications.<sup>6</sup>

End-users can use a microwave to heat honey to 160 °F (71 °C). This is done sometimes to liquefy honey which has granulated and this treatment has little effect on honey's chemical properties. However, honey

which has been overheated will tend to become darker. When using microwave energy to heat honey, it is critical to control carefully the maximum temperature reached to avoid excessive darkening and to cool the honey immediately.

### **References**

- <sup>1</sup> USDA Agricultural Marketing Service. 1985. United States Standards for Grades of Extracted Honey. May 23. USDA, Washington DC.
- <sup>2</sup> AOAC. 1990. Official Methods of Analysis. sec. 985.25. 15th ed. AOAC, Arlington, Va.
- <sup>3</sup> White, J. W. Jr. 1984. Instrumental color classification of honey: Collaborative study. Journal of the AOAC 67(6):1129.
- <sup>4</sup> Castro, R. M. and Escamilla, M. J. 1992. Evaluation of the color of some Spanish unifloral honey types as a characterization parameter. Journal of the AOAC International 75(3):537.
- <sup>5</sup> NHB and AIB. 1990. Honey: Its Utilization in Bakery Products. National Honey Board and the American Institute of Baking.
- <sup>6</sup> NHB. 1995. Honey and Microwaveable Foods. National Honey Board, Longmont, Colorado.