National Honey Board®

MAKING THE SWITCH TO HONEY DELIVERS SWEET TASTE FOR LESS KCAL

Sensory tests shows that just 0.6 Tbsp of honey gives as much sweet flavor for 10 less kcal, compared to 1 Tbsp table sugar[1]

Study Overview: The sweet taste of honey is primarily attributed to it being about 80% sugar. Honey also contains uniquely metabolized sugars that may affect its sweetness. Research on other foods suggest that some aromas may alter sweetness intensity, offering a promising approach to help consumer seeking to limit added sugars in food. Honey stands out among sweeteners for having distinctive intrinsic aroma profiles. This research takes all of these factors into consideration when developing quantified sweetness intensity dose-response curves for a variety of honeys. Results also quantify the impact of aroma on honey's sweetness.

Method in Brief: Four honey floral varietals (clover, wildflower, alfalfa, and orange blossom) were measured for sweetness intensity using a standard sensory testing method called magnitude estimation using the Global Sensory Intensity Scale. Tests were conducted among sensory panelists who were trained to use the scale and who evaluated samples with and without nose clips to determine the impact of aromas on the intensity of sweet perceptions. Sweetness intensity was measured across concentrations ranging including 12.5, 25, 50, 75, 100, up to 125 g of sweetener/L. The lowest concentration is similar to a subtly sweet iced tea beverage and the two highest are comparable to a cola beverage and to a lemonade drink. Once standard sweetness intensity curves were developed, results were translated into sweetness per volume and per kcal as these are the basis for how consumers and health professionals compare and use sweeteners. Findings relate most directly to honey in aqueous solutions, which is the standard for sweetness intensity testing, but other culinary considerations will need to be considered when used in cooking and baking applications.

Findings summarized: Results characterize the sweet taste of honey on a household volume basis, which is how honey is used by consumers. When added to water, honey is 1.7 times sweeter than table sugar on an equal volume basis. For consumers, this means that the same sweetness as table sugar can be achieved with approximately 40% lower volume of honey. This translates to about 21% fewer kcals for the same sweetness.

For example, 0.6 Tbsp of honey provides the same sweetness as 1 Tbsp of table sugar.

- Making the simple swap of 0.6 Tbsp honey for 1 Tbsp table sugar reduces added sugar by 2.5 g and kcal by about 10 kcal.
- Said another way, it takes 1.7 Tbsp table sugar to get the same sweetness as 1 Tbsp honey.
- In recipes, swapping honey reduces added sugar by 41 grams/cup of sugar being replaced while maintaining equivalent sweetness.

Equivalently sweet volumes of honey and sugar; grams of total sugars and kcal of reported volumes.

Equivalently sweet concentrations		Grams of sugars			kcal		
Sugar	**Honey**	**Sugar**	**Honey**	**Difference**	**Sugar**	**Honey**	**Difference**
1 tsp	0.58 tsp	4.19	3.34	0.85	16.2	12.8	3.4
1 Tbsp	0.58 Tbsp	11.98	9.53	2.45	46.2	36.48	9.72
1 cup	0.58 cup	199	158	41	770	608	162

Note: Values were calculated using the average densities (1.43 g/mL, 0.83 g/mL), sugar content (0.794 g/g, 0.998 g/g), USDA kcal values (3.04 kcal/1 g, 3.85 kcal/1 g) for honey and sugar, respectively. Our measured densities differ slightly from USDA reported density.

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Aromas in honey enhanced sweetness on average by 23 – 43% depending on floral varietal. Aromas increase sweetness intensity by 23% in wildflower, 26% in clover, and 28% in alfalfa honey at the 100g/L sweetener concentration. Orange blossom honey, in which aroma enhances sweetness by 43% (100g/L), has the most diverse aroma profile with 87 compounds characterized. The unique sugar composition and distinctive aroma profiles in honey elevate sweetness so that it can deliver the equal sweetness of table sugar with about 20% less sugar.

Conclusions: Distinctive aromas in honey not only make it possible for consumers to select floral varietals that appeal to their personal preferences, but they also elevate sweetness intensity. The authors concluded that "[g]enerally, honey or aromatic sweeteners could be a valuable nutritional strategy to reduce added sugar intake without sacrificing the sweetness of foods." Making the switch to honey from table sugar is a way to reduce sugar and kcal, while getting the sweet flavor the consumer is seeking to achieve.

1. Mulheron, H, A DuBois, E Mayhew. "Quantifying the sweetness intensity and impact of aroma in honey from four floral sources" J. Food Sci. 2024:1-10. http://doi.org/10.1111/1750-3841.17461