



pH & Acids in Honey

General Information

Honey contains a number of acids which include amino acids (0.05-0.1%) and organic acids (0.57%, range: 0.17-1.17%). The average pH of honey is 3.9 (with a typical range of 3.4 to 6.1).

What is the acidity of honey, expressed in meq/kg?

The total acidity of honey is 29.12 meq/kg (average) with a range of 8.68 to 59.49 meq/kg and a standard deviation of 10.33 meq/kg.¹

What are the organic acids found in honey?

A number of organic acids are known to occur in honey, including acetic, butyric, citric, formic, gluconic, lactic, malic, pyroglutamic, and succinic. The major organic acid is gluconic acid. Gluconic acid is produced in honey by the action of the enzyme glucose-oxidase on glucose.

The organic acids present in honey are significant because they interact with other flavors. Gluconic acid has flavor-enhancing properties.

What amino acids does honey contain?

About 18 free amino acids are known to occur in honey, but they are present in small amounts with little nutritional significance. Honey contains 0.05-0.1% amino acids. Proline is the most abundant.

Which other acids are found in honey?

Honey contains a range of aliphatic and aromatic acids. The aromatic acids of honey are important contributors to its flavor. Both free and bound aromatic acids have been reported in a variety of monofloral (from a single type of flower) honeys. Their presence can be used to describe floral sources of honey.

Are acids in honey important in food manufacturing?

Yes, for the following reasons:

- The low pH of honey inhibits the presence and growth of microorganisms.
- Its low pH makes honey compatible with many food products in terms of pH and acidity.
- Acids are an important component of the flavor and aroma of monofloral honeys.
- Acids also contribute to a manufactured product's flavor profile.

How does honey interact with acidic/sour products?

Research funded by the National Honey Board² has shown that the addition of clover, orange blossom and wildflower honeys at a concentration of 25% to a 0.08% citric acid solution decreased the sourness of that solution by 65-70%. The addition of these honeys at a concentration

of 25% to a 0.15% citric acid solution resulted in almost a 75% decrease in sourness perception. Honey has the ability to “smooth” the flavor of very acidic products such as lemon juice or vinegar. The addition of honey can also help increase consumer acceptability of acidic/sour products. Therefore, honey is a highly valuable ingredient in sauces, dressings, condiments, beverages and sweet and sour manufactured foods.

References

¹ USDA. 1962. White, J.W. Jr. et al. Composition of American Honeys. Tech. Bull. 1261. Agricultural Research Service, USDA, Washington, DC.

² Resurreccion, A. 1995. Effect of Enhancement of the Basic Tastes and Desirable Flavors by Honey. Unpublished manuscript. Dept. of Food Science, University of Georgia, Athens, Georgia.