



Kingdom of Saudi Arabia
Saudi Food & Drug Authority



Educational guide about honey

for investors

Honey

Honey is the natural sweet substance produced by various species of honey bees from the nectar of flowers or from secretions of living parts of plants or from secretions of insects feeding on plant sap. All types of honey are considered beneficial and safe for use. However, some individuals may experience side effects, including allergies and the risk of increased blood sugar levels for those with diabetes.



Facts about honey

- Honey should not be given to children under one year of age due to the risk of bacterial contamination, which can cause infant botulism.
- It's a high-carbohydrate food source, typically containing a diverse range of nutrients including minerals, proteins, vitamins, and others.





Honey components

Honey mainly consists of water and various types of sugars including monosaccharides (fructose and glucose) and disaccharides (sucrose), along with other sugars. Additionally, it contains substances such as organic acids, and its composition varies depending on the plants the bees feed on.

Other components:

Enzymes:

Basic honey proteins including invertase, diastase, glucose oxidase, and others, derived from bees or the plants they feed on. These are present in small amounts. Glucose oxidase produces hydrogen peroxide, which possesses antibacterial properties. Enzyme levels sometimes serve as an indicator of honey quality, affected by high heating above 53 degrees Celsius and storage at high temperatures. Therefore, a decrease in enzyme levels indicates that the honey has been heated, although some honey naturally contains low enzyme levels.

Methylglyoxal:

One of the antibacterial compounds found in most types of honey, usually in small amounts. It is characterized as a clear yellowish liquid with low viscosity and a distinctive odor. However, a study on a type of honey, Manuka honey, suggested that using methylglyoxal within rating grades might be misleading to consumers because its antibacterial activity may not necessarily be present at the time of purchase or use. Thus, further studies are required on different types of honey regarding the efficacy of this substance.

Honey Contaminants:

Contaminants and Toxic Compounds

Honey can be contaminated from the environment like any other type of food, for example: heavy metals, pesticides, antibiotics, and others.

Generally, the levels of pollution present do not pose a health risk

Hydroxymethylfufural

Hydroxymethylfufural (HMF) is a product of fructose breakdown, forming slowly and naturally during storage and more rapidly when heated.

Consequently, as its value increases, the quality of honey decreases.

Microorganisms

Honey may contain bacteria, yeasts, molds, and others, but these are few compared to other natural foods since they cannot grow and multiply in honey due to its high sugar concentration, high osmotic pressure, and antibacterial activity.

Honey Description:

Color: It varies from almost colorless (transparent) to dark brown, with the color differing depending on the botanical source of the nectar bees feed on, their age, and storage conditions. However, transparency depends on the amount of suspended particles like pollen grains.

Density: It can be liquid, viscous, or completely or partially crystallized, depending on a wide and varied range of substances, thus differing with its composition, especially with its water content.

Taste and Flavor: Varies, reflecting the source plants the bees feed on.

Crystallization: Crystallization occurs naturally in honey, transforming its texture from liquid to a more solid consistency due to sugar crystallization, which may be homogeneous or with crystals settling at the bottom.



Honey Properties:

Acidity: The relative acidity of honey is relatively low but important for its taste. Bees add most of the acids to honey, with the main acid being gluconic acid, which is a product of glucose oxidation by glucose oxidase.

pH: Most honey is acidic, meaning its pH value is less than 7.

Fermentation: Fermentation of honey can be a problem sometimes. Major factors causing fermentation include high moisture content, temperature, and yeasts.

Honey Classifications:

Honey can be classified based on its origin as follows:

Blossom honey or Nectar honey:

- Monofloral: Honey derived from the nectar of a single type of flower, named according to the plant, for example, citrus honey, manuka honey, acacia honey.
- Multifloral: Honey with multiple botanical sources, for example, meadow flower honey, forest honey.

Honeydew honey:

- Honey produced by bees from the secretions of sap-sucking insects or the living parts of plants.

Honey can be classified according to extraction methods or the following forms:

Comb honey:

- The honey stored by bees in the honeycomb cells, which are sold in sealed whole wax combs (with their protective layer) or parts of these combs.

Cut comb in honey:

- Honey containing one or more pieces of honeycomb wax.

Extracted honey:

- Honey obtained from honeycomb cells (after removing their protective layer) using a honey extractor (centrifugal device).

Some General Requirements:

- Honey should not contain any natural or artificial food additives.
- It should be free from any foreign odors, tastes, or flavors acquired from external factors or foreign materials during preparation and storage.
- Natural acidity of honey should not be altered.
- Honey should not have started fermenting or foaming (foam resulting from fermentation).
- Heating or processing honey should not exceed the point that alters its basic composition, affects its quality, or inhibits the activity of naturally occurring enzymes, reducing their effectiveness.



Honey tests

Estimation of fructose to glucose ratio -
Estimation of moisture content - Estimation of
acidity - Estimation of sucrose content -
Estimation of insoluble solids in water -
Estimation of diastase enzyme activity -
Estimation of reduced sugar content
- Electrical conductivity - Estimation of
hydroxymethylfurfural content

Honey Packaging and Storage Methods:

Containers should preserve the properties of honey and not affect its contents due to the migration of some of its components, their reaction, or mixing with the food substance. Honey containers should be stored away from intense light sources or high temperatures.

Illustrative Data:

The honey product should contain the following information:

- Product name (honey).
- The name of the country where the honey was produced and the country of packaging, and the name of the producing or packaging company.
- The following may be added:
- The name of the honey source, whether geographically (if proven to be a product specific to a geographical area) and/or the terrain (mountainous/desert... etc.) and/or the plant source if it is clear in its components and sensory, physical, chemical, and microscopic properties, and the common or botanical name of the floral source should be adjacent to the product name (honey).

■ **Honey can be labeled according to extraction methods as follows:**

- Extracted honey.
- Compressed honey.
- Refined honey.

- Honey can be labeled according to forms as follows:
 - (Honey Beehive) for liquid honey, crystallized honey, or a mixture of both.
 - (Beeswax Tablets).
 - Beeswax tablets cut in honey.
- The phrase "Dew Honey" should be placed on the package when applicable to the honey.
- Adding the phrase "Mixture of flower honey with dew honey" when mixing flower honey or nectar with dew honey.
- Placing the phrase "Filtered Honey" near the product name when applicable to honey that has been filtered through filters (sieves allowing the removal of part of the pollen grains).
- If the honey is naturally low in enzymes, this should be stated on the product label.

