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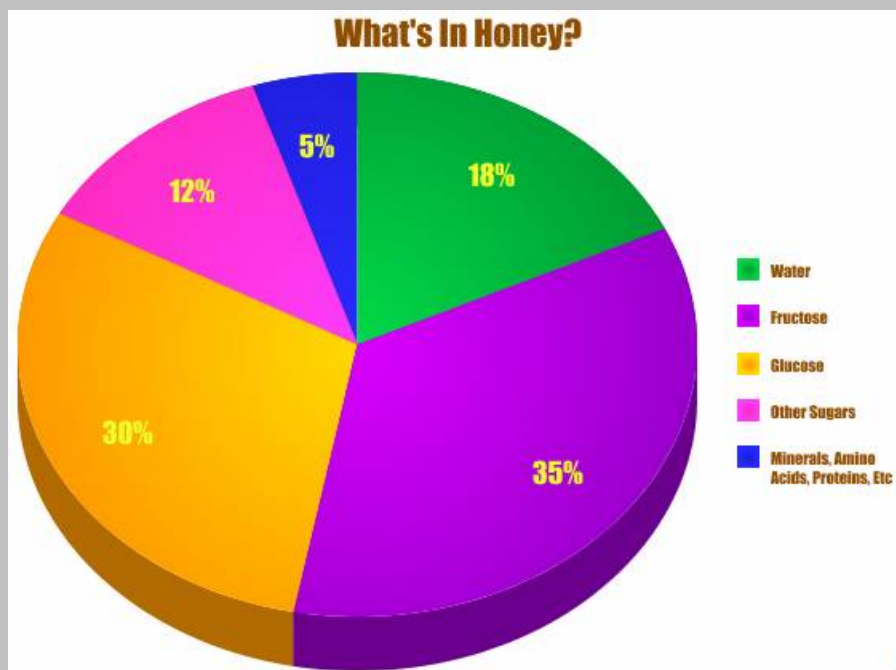
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Honey Ingredients: What is Honey Made Of?

Honey Composition: Basic Explanation

Honey is composed of mainly of carbohydrates and lesser amounts of water with a number of minor ingredients. **The graph below gives a good breakdown of honey ingredients by showing types and amounts** . Also below, For those of you with curious minds I've included a little more detail:



Honey Composition: Advanced Explanation

So you already know from reading the basic explanation and looking at the chart that honey is mostly water, carbs and some other stuff. Lets get a little more detailed about how those honey ingredients work together and make honey the special, healthful sugar source that it is!

Carbohydrates: Sugars are the main ingredient in honey. They comprise almost 95% of honey's dry weight. There are 2 monosaccharides (the most basic form of carbohydrate) that make up honey: Fructose and Glucose. There is one more carbohydrate found in honey called Sucrose. Sucrose is a disaccharide and is made from the combination of fructose and glucose.

In addition, there are about 25 other sugars that have been identified in honey. It's also interesting to note here that the types and amounts of sugar found in a particular honey can vary quite greatly from honey to honey depending its floral source.

Honey Acidity: The acid content of honey is quite low, but it does effect honey taste. The primary acid source in honey is gluconic acid but its actually present in a different form, an ester, that does not contribute to the acid level of honey.

Most honeys are considered acidic (a value lower than 7) on a pH scale. Interestingly enough, the honeybee actually adds most of the acid to honey as it processes the nectar it gathers from flowers. Once again, the acidity can vary depending on the source of the honey. As a general rule, the darker the honey the less acidic it is.

Amino Acids & Proteins: Honey is not a large source of protein including amino acid chains. They comprise about 1% of honeys total volume. Despite the small volume amino acids and proteins are very important to honey in a couple of ways.

1. The protein enzymes glucose oxidase and catalase regulate the production of Hydrogen Peroxide or H₂O₂ which is one of the keys to honey antibacterial properties.
2. The protein enzymes **diastase and invertase and the amino acid proline are key criterion to judging the quality and age of honey.** They are also several in a line of enzymes sensitive to heat and light which is why you should NEVER heat honey above 110 F.

Hydroxymethylfurfuraldehyde (HMF for short): This tongue twister of a honey ingredient is a key in determining honey freshness and overexposure to heat. Its a product of the breakdown of glucose and is not present in young or unheated honey. Some countries regulate the labels of "quality" or "virgin" honey by the amount of HMF found. Germany, Italy, Finland and Switzerland have set a maximum of 15mg per kg on these special labels.

Minerals: The mineral content found in honey varies. **One of the main minerals found in honey is potassium. In fact, its often about a third of the total mineral content is potassium.** As a general rule, lighter blossom honey is lower in mineral content when compared to darker varieties.

Aroma Compounds: Ever wonder what makes honey smell and where that smell comes from? Well a substance called honey volatiles are the source! Often these volatiles come from the plant the honey is sources from but occasionally the bees add them.

Contaminants: As with any food, honey can be contaminated. The usual contaminants are heavy metals and chemicals such as pesticides and antibiotics feed to the bees by the beekeeper.

Antibiotics are often the top source of contamination. As a beekeeper I think this is unacceptable. Fortunately, some organizations, primarily the EU, have cracked down on the use of antibiotics in beekeeping by banning antibiotics in honey.

Additionally, there have been cases of honey poisoning. There are a few sources of nectar that actually produce toxic nectar. These sources are not widely found in the North America, but care should be taken when buying honey from a local beekeeper.

Bacteria and Yeast: You may already be aware that because of the high sugar content in honey it is virtually impossible to for microorganisms to grow in a honey solution. In fact **honey contains less microorganisms than any other natural food on the market today!**

There are bacteria present in honey. The most famous of which is botulinum. These bacteria pose a potential threat to children under the age of 1. Recent studies have shown that this risk is extremely isolated as the amount of the bacteria in honey is very low and that the warning is unnecessary as there are many other natural foods which also contain botulinum.

Honey comes by its yeast content naturally. Yeast can cause undesirable fermentation. In order to avoid this, honey should be harvested at a low humidity and should be stored in air-tight vessels.