

How bees make honey



Honey bees collect nectar and pollen from flowers, but only nectar is used to make honey. Nectar is a "reward" given by the plant to attract bees. Pollen is transported back to the hive in the pollen baskets on the hind legs whereas the nectar is transported in the stomach. Nectar is mostly water with dissolved sugar. The amount of sugar varies greatly but is usually 25-50%. Back in the hive the nectar is placed into wax honeycomb cells and the excess water evaporates until the honey is approximately 83% sugar and 17% water. This takes a few days. The cell is then covered over with a layer of wax which is later removed when the bees need to eat the honey. When large amounts of nectar are being collected the bees speed up evaporation by using their wings to ventilate the hive.

The sugar is also changed. Sugar in nectar is mostly sucrose (table sugar). Sucrose has large molecules. The bees produce an enzyme which breaks each sucrose molecule into two smaller sugar molecules, glucose and fructose. By evaporating the excess water and converting the sucrose into smaller sugars the bees make the honey too concentrated for yeasts and other microorganisms to grow. Preventing spoilage is important to the bees because the honey made in the summer is used as winter food.

Without at least 10kg of honey a bee colony cannot survive the winter, when there are no flowers. In addition to sugar, nectar contains other chemicals. Although these are only present in small amounts they are important because they give different honeys their distinctive colours and flavours. Although the bees from one

colony collect nectar from many species of plants, at certain times they collect most of their nectar from one or a few species of plants that are very abundant. These "nectar flows" are responsible for most of the honey that actually gets stored. Beekeepers often harvest honey after a nectar flow, thereby producing honey predominantly from a single plant species and with a characteristic flavour and colour.



Did You Know?

- * Beekeepers often move their hives to places where there are lots of flowers. The hives are moved by vehicle at night when the bees are all inside.
- * A full-time bee farmer usually keeps 1000 or more hives. With 30,000 bees per hive that makes 30 million bees to look after.
- * The bees in a hive help each other to forage more efficiently by telling each other the direction and distance of flower patches using the "waggle dance".
- * The Quran says this about bees and honey "From its belly comes forth a fluid of many hues, a medicinal drink for men". In other words, honey is good for you!

How Amazing!

- * When full, the honey stomach can weigh more than half a forager bee's unladen weight and the forager's abdomen is visibly longer.
- * It takes approximately 50,000 bee loads of nectar to make one pound of honey.
- * Honey bees will collect nectar as far as 14km (8 miles) from their hive.
- * The ancient Egyptians used honey to help wound healing. Modern science has shown that honey kills bacteria and honey is coming back as an antiseptic.