

# How bees make honey

The first stage is for the bees to collect nectar from plants using their proboscis.



The colour, texture and taste of honey is affected by the type of flowers the bees forage on.

Bees can travel up to 4 miles to collect nectar but normally travel up to 2 miles.

The nectar is stored in their honey stomach which is separate to their digestive system.



If the bees need to drink some nectar it opens a valve in it's honey stomach to release nectar into it's digestive system.

The valve only allows nectar to go one way and the nectar cannot return to the honey stomach.

The bee adds enzymes to the nectar to change the nature of the sugars in it that makes it more acidic which contributes to the honey's antibacterial properties.



When the bee returns to the hive it transfers the nectar to waiting bees and then goes out to forage again.

The nectar is eventually stored in the wax comb the bees have built.



As the nectar is still quite watery [ $\sim 80\%$ ], the comb is built at an angle of  $\sim 14^\circ$  to stop it dripping out.



The hive is quite warm [ $\sim 32^\circ\text{C}$ ] and the water in the nectar starts to evaporate. To help this bees fans the nectar with their wings until it's at the correct water content [ $\sim 17\%$ ].

Once the honey has the right sugar mixture and water content, the bees cap the cell with wax to be stored for when it is needed.



Bees only eat honey and they cannot make more during the winter so the cells act as a winter food store. Therefore, it's critical they make enough during the Summer so they can survive the winter.

- To produce a pound of honey, foraging bees have to fly 55,000 miles!
- each bee will only produce around one twelfth of a teaspoon of honey in its life!
- a honey bee visits 50 to 100 flowers during a collection trip.
- it would take 1,100 bees to make 1kg of honey and they would have to visit 4 million flowers
- it takes about 556 foraging bees to visit 2 million flowers, just to make a pound of honey!

