

## How do bees make honey?

And why does it smell like sweaty socks?!

### 1. FUEL FROM FLOWERS

Honeybees venture forth from the hive to gather nectar from flowers. Nectar varies by flower species, but is primarily a mix of sugar, water, and various proteins and amino acids. A portion of the nectar provides worker bees with the energy they need to visit up to 100 flowers each trip. The majority of the nectar, however, goes into a specialized storage stomach so the bee can transport it back to the hive.

### 2. DOUBLE DIGESTION

At the hive, worker bees regurgitate the nectar to pass it off to processor bees. Processor bees do most of the honey making because they've got more of the enzymes that finish breaking down nectar's complex polysaccharides into usable sugars. For example, invertase converts sucrose into glucose and fructose. After about half an hour of digesting, the processor bees regurgitate the honey into one of the holes of the hive's honeycomb.

### 3. DRYING DOWN

At this point, the honey is still roughly 70% water. For the honey to last in the hive — or in your pantry — without fermenting, the water content needs to be much lower so microbes can't survive. The bees fan the honey with their wings, circulating the air of the hive to carry away evaporated water until the honey is less than 18% water. Then, the tiny chemists seal the hole in the honeycomb up with wax.

\* How much honey can a single bee make in its lifetime?

#### Sources:

<http://www.compoundchem.com/2014/08/21/chemistryofhoney/>

<http://www.chm.bris.ac.uk/webprojects2001/loveridge/index-page3.html>

<https://www.seriouscats.com/2014/07/how-honey-gets-made-bees.html>

<https://link.springer.com/article/10.1007/s00040-003-0682-4>

<http://honeycouncil.ca/bee-facts/>

<https://www.honey.com/newsroom/presskit/honey-trivia>

Created by ACS with assistance from Shannon Ryan, ACS Productions.

**American Chemical Society**

1155 Sixteenth Street, N.W. Washington, D.C. 20036 T [202] 872-6042 F [202] 872 4370 [www.acs.org](http://www.acs.org)