



Ontario Agri-Food Education Inc.

# What's all the buzz about? Ontario bees and bee-autiful honey!



## 100% ONTARIO HONEY

### Honey bees

, although small, play a very significant role in food, farming and the environment. They also produce nature's unrefined sweetener – honey – from the nectar of flowers.

Honey is mostly made up of two simple sugars, laevulose and dextrose. It is 17 per cent water and contains traces of the sugars maltose and sucrose, as well as vitamins, minerals, organic acids and enzymes.

Because honey is mainly made of simple sugars, which are quickly absorbed into the bloodstream, it is an instant source of energy.

Bees and the beekeeping industry are of the utmost importance to the health and vitality of Canada's agricultural industry and to the country's economy. Bees play an indispensable role in the pollination of our essential crops. In fact, bees are responsible for the health of \$170 million worth of crops in Ontario each year.

Canadian beekeepers produced 61.4 million pounds of honey in 2007. Of that, 5.6 million pounds were produced in Ontario by 75,000 bee colonies maintained by 2,300 beekeepers.



### Q What is honey and where does it come from?

A Honey is a natural, unrefined, sweet fluid produced by honey bees from the nectar of flowers. It is 25 per cent sweeter than sugar because of its high fructose content.

Canada has many varieties of honey, the most common of which comes from the nectar of clover. Other delicious varieties are produced from the nectar of canola, alfalfa, blueberries, sunflowers, fruit trees and wildflowers. Creamed honey, which always remains smooth, is prepared by adding finely granulated honey to liquid honey and storing it in a way that controls crystallization. This process ensures only small uniform crystals form in the honey so it remains smooth and easy to handle. Comb honey is honey sold in its unaltered state – sealed in the wax made by honey bees in the hive.

### Q Is honey good for you?

A Yes! As a refined-sugar substitute, honey can sweeten food with fewer calories than sugar. For the same sweetening power, replace 1 cup of sugar with 2/3 of a cup of honey. Honey also contains important vitamins and nutrients: Two tablespoons (30 ml) of honey contains 25 milligrams of potassium. It also contains trace amounts of vitamins C, B and even A, D and K. Honey is a safe and wholesome food for older children and adults, but should not be fed to infants less than one year of age because their digestive system is not developed enough.

But honey's health benefits don't stop there! It also has antibacterial properties, meaning honey can help to keep bad bacteria away. When diluted honey is applied directly to a moist wound, it produces hydrogen peroxide, an anti-bacterial agent.

**BEE-LIEVE IT OR NOT:** The average Canadian consumes a little over one pound (454 grams) of honey per year. Bees must visit approximately 2 million flowers to make one pound of honey. To reach all these flowers, bees often fly a distance equivalent to a trip around the world, just to get enough nectar to produce a single pound of honey.



**Q****What is the difference between light and dark honey?****A**

The colour of the honey depends on the type of nectar collected by the bees. Clover produces honey with the lightest colour and mildest flavour. Buckwheat honey is the darkest in colour and strongest in taste.

**Q****How is honey graded?****A**

Liquid and creamed honey are graded according to their quality. Grades are based on freedom from foreign material, colour and standards of moisture content. The grade consumers should look for is No. 1, which has low moisture content and keeps well.

**Q****How should honey be stored?****A**

Honey should be stored in tightly sealed containers in a cool dark place.

Honey is a humectant, meaning it retains and preserves moisture, making it an ideal addition to baked goods to help increase their shelf life. This also makes it an ideal ingredient for skin and hair beauty products!

**TIP:** To re-liquefy honey that has become cloudy and granular, place the jar in a pan of hot water or gently heat it in the microwave. Creamed honey can also be liquefied in this way for ease of use in cooking.



## Occupants of the hive

### The queen

The queen is the mother of all the honey bees in the hive. She does not act as a ruler of the hive, but she is waited upon, fed and protected by the worker honey bees. The queen has only one job in the hive: to lay eggs. She may lay as many as 2,000 eggs in a single day. A queen may live for three years and can be recognized in the hive by her long narrow abdomen and short wings.

### The drones

The male occupants of the hive are larger than the workers and can be recognized by their large, round, dark abdomen and their extremely large eyes. Drones don't work in the hive since their only responsibility is to mate with a virgin queen. In the fall of each year, the workers force the drones out of the hive to lower the population and conserve food for themselves and the queen.

### The workers

Most of the honey bees in a hive are female worker bees. Although worker bees are the smallest inhabitants in the hive, they have the biggest list of responsibilities and duties to perform, which change throughout their short 35-45 day summer lifespan.



Once the worker has emerged from her honeycomb cell, she serves as a nurse bee. Nurses feed the brood (the baby larva), and clean the brood cells where the queen will lay her eggs. During the next two weeks, the worker bee serves as a house bee. House bees clean the comb, secrete wax to build cells, make honey, store pollen, feed and clean the queen and guard the hive against intruders. Once her work inside the hive is done, the worker bee graduates to her last job as a field bee. Field bees collect the pollen, nectar and water to feed the whole colony.

Worker bees have such a short lifespan because they are in and out of the hive so much during their final role as a field bee that they literally wear out their wings and can't return to the hive.

BEE-LIEVE IT OR NOT:



Honey bees communicate by dancing and the dances tell worker bees where to find nectar.



### What is a bee colony?



Honey bees are called "social insects" because they live together in a co-operative society where adults and young share the same dwelling. No individual honey bee can survive on its own: they are all dependent on each other. A colony generally contains one breeding female, or 'queen'; a few thousand males, or 'drones'; and a large population of sterile female 'worker' bees. The population of a healthy hive in mid-summer can average between 40,000 and 80,000 bees.

Honey bees live in colonies that are often maintained, fed and transported by beekeepers. The modern beehive provides a place for the colony to live and store its honey. It is made up of a series of square or rectangular boxes, without tops or bottoms, which are placed one on top of another. Bees build the wax honeycomb to raise their young and store their honey on frames hung inside the boxes.



### What is pollen and what happens in pollination?



When a honey bee lands on a flower to collect the nectar it gets covered with pollen. The dust-like pollen clings to the hairs on the honey bee's body. When the honey bee visits the next flower, the pollen on its body brushes off against the female part (pistil) of that flower, leading to pollination. Pollination is the fertilization of a flowering plant. It is the transfer of pollen from the anthers of one flower to the stigma of that or another flower. When pollen is carried from one plant to another it is called cross-pollination.

Bees collect pollen in their pollen basket (a concave area on the hind legs of the bee with special hairs to hold the pollen in place) and carry it back to the hive. In the hive, pollen is used as a protein source necessary during brood-rearing. Excess pollen can be collected from the hive and is often eaten as a health supplement.

Many fruit-tree farmers hire beekeepers to place hives of honey bees in their orchards during the blossoming season. They do this to ensure the flowers on their trees are pollinated properly in order to produce a healthy crop of fruit later in the growing season. For more detailed information on pollination, visit [www.ontariobee.com](http://www.ontariobee.com).



### Why do bees make honey?



Honey bees collect nectar and store it as honey in their hives. Nectar and honey provide the energy for the bees' flight muscles and for heating the hive during the winter period. Honey bees also collect pollen, which supplies protein for bee brood to grow.

BEE-LIEVE IT OR NOT:

Honey bees are herbivores and are not aggressive by nature - they only use their stinger if they feel threatened.



### What is beeswax?



Beeswax is produced by worker bees to make the honeycomb within the hive. It is used for the brood chambers – where young bees live – and for storing honey. When the bees have filled each cell in the comb with honey, they cover all the cells with wax caps. At harvest time, the beekeeper extracts the honey from the comb and may also sell the wax. Beeswax is used as an ingredient in many products, including make-up, cold creams, shaving creams, shoe and furniture polishes, candles, chewing gums, crayons and waterproofing materials.

Honey bees pollinate more than 90 food, fibre and seed crops like almonds, apples, oranges, melons, broccoli, tangerines, cranberries, strawberries, vegetables, alfalfa, soybeans, sunflower and cotton. In fact, honey bees pollinate about one-third of the food in the human diet.



## Honey bee management

Management is scheduled around natural nectar flows. Beekeepers want their colonies to reach maximum strength **before** the nectar begins to flow. Bees store the honey as surplus that the beekeeper can then harvest.

Honey supers are the boxes that provide frames and foundations for the bees to store surplus honey. In late summer the beekeeper collects the honey supers from the hive leaving the brood chambers in place. It is the honey stored in this part of the hive that will see the colony through the winter.

To harvest the honey, the beekeeper removes a super and takes off the cappings on the top of the honeycomb using a hot uncapping knife. Once this is done, the frame is placed in an extracting machine, which spins the honey from the honeycomb. The honey runs down the side of the extractor and out a pouring spout. Before the honey is put into jars it is strained to remove any foreign materials.



### Nutrition Facts

Serving Size 1 Tbsp (21 g)  
Servings Per Container 22

Amount Per Serving	% Daily Value*
Calories 64	
Total Fat 0g	0%
Sodium 0mg	0%
Total Carbohydrate 17g	6%
Sugars 16g	
Protein 0g	

\* Percent Daily Values (DV) are based on a 2,000 calorie diet

## Honey's Nutritional Profile

Honey is composed primarily of carbohydrates and water, and also contains small amounts of a wide array of vitamins and minerals, including niacin, riboflavin, pantothenic acid, calcium, copper, iron, magnesium, manganese, phosphorus, potassium and zinc.

Of recent interest is the antioxidant content of honey. Honey contains a variety of flavonoids and phenolic acids, which act as antioxidants, scavenging and eliminating free radicals. Generally, darker honeys have a higher antioxidant content than lighter honeys. Honey tastes delicious and is good for you too. Unbee-lievable!



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### For further information:

[www.ontariobee.com](http://www.ontariobee.com) Visit sales and services for a great teacher's kit and tons of fun information. There is additional nutrition research found on this site as well.

[www.ontariohoney.ca](http://www.ontariohoney.ca) for great recipes and ways to use honey.

[www.honeycouncil.ca](http://www.honeycouncil.ca) The Canadian Honey Council, click on "beekeeping" to get you started.

[www.omafra.gov.on.ca](http://www.omafra.gov.on.ca) The Ontario Ministry of Agriculture, Food and Rural Affairs. Search "apiculture", "beekeeping" and "honey" for more information on the beekeeping industry in Ontario.

[www.statscan.ca](http://www.statscan.ca) Statistics Canada. Production and Value of Honey and Maple Products 2007, Catalogue no. 23-221-X

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