

Bee Byproducts

Honey is but one of the items created by ever-industrious honeybees.

HONEY IS AS SENSATIONAL as it is sweet, but if you thought honey-making was the only work occupying bees inside that hive, think again. A mind-boggling array of insect activities are creating amazing stuff right under our noses, and some of these products can even be used to treat our noses ... er, allergies, and other common ailments.

According to the American Apitherapy Society, apitherapy (from the Latin *apis* for bee) is the medicinal use of products made by honeybees. Step into any health food store and you'll find a bee-dazzling selection of bee byproducts for sale. Not only are these products life-sustaining to bees, they can be helpful to humans as well. A word of caution, however: Not all claims are scientifically substantiated.

Beeswax

Pure beeswax from *Apis mellifera* consists of hundreds (284 to be exact) of different compounds including saturated and unsaturated monoesters, diesters, saturated and unsaturated hydrocarbons, free acids and hydroxy polyesters.

Beeswax is made by young bees (2 to 3 weeks old) in the hive, after they feed the young brood with royal jelly and before the young bees leave the hive to forage. Worker bees engorged with honey secrete small, colorless wax platelets (scale-like shapes) from eight wax glands on the underside of their abdomens. These then are scraped off by other worker bees and chewed into pliable, opaque pieces by the action of saliva and enzymes. Once chewed, re-chewed and attached to the comb, the pieces form the building blocks of the hive – the hexagonal cells of the honeycomb.



FREDREHAT/SHUTTERSTOCK

Wax, this crucial element of the hive, is used to build comb cells for the young, and, when mixed with propolis (see below), seals cracks in the hive and protects the brood from infections. Beeswax also is used to build storage cells for honey and to cap the ripened cells.

Of all bee byproducts, wax has been, and remains, the most versatile and widely used material. Throughout history, beeswax has been more valuable than honey, and it was even considered legal tender in parts of Europe – people paid their taxes with it!

Today, beeswax has dozens of uses – from cosmetics, food and pharmaceuticals to candles, modeling and polishes.

Propolis

Bees gather resins from trees, flowers and artificial sources to make a sticky substance called propolis. The makeup of propolis varies depending on the hive, the season, the area and the available resin sources, but a “typical” northern temperate propolis is made up of about 50 percent resins and vegetable balsams, 30 percent waxes, 10 percent essential oils, and 5 percent pollen. The chemical composition varies as well, depending on the region's vegetation. Bees use this sticky substance, also known as “bee glue,” to patch cracks in the hive and to provide a protective layer against bacteria and fungi. When propolis dries, it becomes hard and impervious.

Twentieth-century research indicates that propolis is used by bees to reinforce the structure of the hive, to reduce vibration, to create a barrier against diseases and parasites entering the hive, to inhibit bacterial growth, or “quarantine” threats inside the hive.

Propolis has been used for centuries by many cultures for its antiseptic, antimicrobial and detoxifying properties. In countries where antibiotics are not widely available, propolis is commonly used to heal a wide variety of wounds including burns, ulcers and inflammation.



ON THE WEB

Learn more about the nutrition and health benefits of honey.

Propolis is said to prevent the growth of bacteria in cuts and burns when used as an antiseptic wash or salve. Similar to honey being used to alleviate allergies, propolis is used as an antihistamine, and it's commonly taken as a remedy for sore throats.

Just like any other hive product, the properties of propolis vary with the sources used by each individual hive. Therefore, any potential medicinal properties of one propolis may not be present in another.

Bee pollen

Pollen, male-gamete-producing material, is formed in the anthers of flowering plants. The major components of pollen are proteins and amino acids, lipids and sugars. Pollination involves transferring the pollen onto the stigma (the female component) of a flower by wind, water, bird or insect, with bees being a reliable pollination vehicle for many plants.

Worker bees gather pollen while out foraging, bring it back to the comb, and store it. There they pack it into granules and add honey and nectar (or sugar and enzymes), turning it into "bee bread" through lactic acid fermentation. Pollen is the primary source of dietary protein for bees, and consuming it enables them to produce beeswax and royal jelly (more on this later).

The effects and benefits of consuming pollen are endless, according to some of the non-scientific literature on the subject; however, the benefits reported are usually a result of personal experience rather than from scientific studies.

The only long-term, reliable measures on the medicinal effect of pollen are related to prostate problems and allergies. Clinical tests and observations in Western Europe have indicated bee pollen to be effective in treating prostate problems ranging from infections and swelling to cancer (Denis, 1966 and Ask-Upmark, 1967). Bee pollen is used therapeutically, through oral administration, to treat symptoms of hay fever and pollen sensitivity, due to its anti-inflammatory properties.

The major use of bee pollen today is as

a food supplement, though its value is frequently overstated without data to back up claims. Consuming bee pollen is considered beneficial; just don't stake your life on the manufacturer's claims.

When considering bee pollen as a food supplement or medicine, it's important to know that pollen from each bee colony is different – pollen from one part of the world is always different from that of another – and no one pollen type can contain all the beneficial attributes of "pollen" in general.

Royal jelly

Royal jelly is a white, fluid, paste-like substance secreted from glands in the heads of worker bees, and fed to all bee larvae in the colony. It's composed of 67 percent water, 12½ percent crude protein, 11 percent simple sugars, 5 percent fatty acids, and trace minerals, enzymes and vitamin C.

Royal jelly is produced by nurse bees when they are 5 to 15 days old; they feed royal jelly to all bee larvae for the first three days of the larvae's existence, but after three days only the female larvae designated to be queens are fed large quantities of royal jelly, which begins a series of molecular events – an epigenetic modification of DNA – resulting in ovary development. The queen then matures into a large, fertile and long-living bee, and she continues to be fed royal jelly exclusively throughout her life.

Royal jelly is harvested from queen cells at 4 days of age. It can only be collected from queen cells because an excess amount is deposited there to feed the queen (she literally "swims" in it), and worker larvae cells consume the royal jelly immediately as it is fed to them.

Royal jelly has a pungent odor and a sour flavor. It has antimicrobial and antibacterial qualities, similar to other hive products. Research has suggested that royal jelly may stimulate the growth of neuroglial cells and in turn may help treat Parkinson's and Alzheimer's diseases. It's also gotten some traction for lowering cholesterol, suppressing the vascularization of tumors, fighting inflammatory diseases, and treating wounds.

BEESWAX BALM

Get some nonmedicinal experience handling products from the hive by making this simple, all-natural lip balm. Besides the beeswax, its ingredients probably are in your pantry now.

½ ounce beeswax

1 teaspoon honey

4 ounces olive oil

Mint extract to taste (about 20 drops), optional

1 Weigh beeswax and measure remaining ingredients.

2 In small double boiler, add beeswax and melt. Once melted, add honey and oil, and stir for 1 to 2 minutes. Add extract and stir well. (Be aware that the honey will not fully mix with the oil because of the water content, but it's a good healing agent for the skin.)

3 Pour heated mixture into a small glass container or beaker, then distribute into lip balm tins or tubes.

NOTE: Adding more or less beeswax will make the lip balm harder or softer depending on your preference; the harder it is, the longer it stays on your lips. You also can add vitamin E oil or grapefruit seed oil as a preservative. You also can mix oils, such as almond oil, sunflower seed oil and others, depending on the availability and the product you wish to make. Other oils and butters alter the texture and healing properties of the final product.

— Recipe by Andy Olenick

Royal jelly, as intended for humans, is classified as a dietary supplement. The use of royal jelly is mainly linked to its reputation for being a stimulant and its inherent therapeutic value. However, the data required for classifying it as a medicine are not sufficient.

— Karen Keb