

Extracting Honey

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The main reason for keeping bees is to harvest the honey they produce. Before the nectar collected from flowers becomes honey, the bees bring about several changes. Enzymes are added and excess water is evaporated until the water content is reduced to about 18%. The latter is essential if the stored honey is not going to spoil because of fermentation. The bees achieve this in several ways. In particular, currents of air are distributed around the hive by the bees fanning their wings, thus bringing in dry air and expelling moist warm air. When the honey is 'ripe', the bees seal each cell with a wax capping. When the combs in a super have been mostly capped in this way, the super is cleared of bees and removed for extraction. The cappings are cut off with a knife to expose the honey before extraction.

To remove the honey from the combs you will need an extractor - most designs consist of a drum in which several frames can fit and these are then spun round to throw the honey out of the combs by centrifugal force. The first centrifugal extractor was invented by the Austrian Major Francesco de Hruschka in 1865. The idea came to the inventor, according to legend, as he watched his son swinging some honeycomb in a basket round his head! There are two basic types of extractors. The tangential type has the faces of the combs placed at right angles to the radii or tangentially. Honey is removed from the outer face - the combs have to be reversed to complete the extraction. The radial type removes honey from both sides in one operation. The frames are arranged like the spokes of a wheel on radii of the rotor.

New extractors are expensive so don't buy one until you are certain of your interest. Your local association may have one you can borrow or hire. Since their invention, much beekeeping equipment, including extractors, has been made from tin-plate. However, recent legislation prohibits their use - don't, therefore, be tempted into buying second-hand equipment, unless it is made from food-grade plastic or stainless steel.

The third rule of beekeeping: "You will leave the extractor tap open (only once!) and have your precious honey on the floor". Be warned - honey flows silently! And however careful you are, every door handle and surface will be sticky.

The extraction of heather honey is somewhat different to other honeys. Heather honey is thixotropic or jelly-like and has to be pressed out of the combs - alternatively, the honey can be eaten in the comb. Agitation of the honey in the cells causes the honey to become temporarily fluid, so that it can be extracted in a conventional extractor. Small-scale beekeepers use a device called a Perforextractor - more sophisticated equipment is available but it is expensive. I recall seeing a demonstration of an adapted discarded spin drier being used to

extract heather honey with great efficiency. Heather honey does command a higher price.

If you don't want extracted honey, an alternative is to cut comb into pieces and use and sell it as 'cut comb' for which there is a ready market. You do, however, lose the honeycomb that could have been re-used, but cut-comb fetches a higher price. Farmers in most areas are now cultivating large acreages of oil seed rape. Honey from this source granulates or crystallises rapidly, which is said to be undesirable in cut-comb - but there are customers who seem not to mind. You can purchase a comb cutter to give either 8 oz or 12 oz pieces and plastic cases in which to package them. It is necessary to use thin unwired foundation in the supers if you intend to produce cut comb.

Supers containing rape honey must be removed and extracted when the water content has been reduced sufficiently to avoid subsequent fermentation and before it sets solid in the comb preventing extraction in the usual manner. This is usually when about 2/3 rds of the comb have been capped. Don't try straining straight from the extractor. Fill suitable containers and use as required. The solidified honey will need melting before straining through muslin and will be warm enough to strain easily. An insulated cabinet for melting honey can easily be constructed for this purpose. A refrigerator from the local tip can provide an insulated body - a bulb provides the heat. Refinements include a thermostat and fan to circulate the air. A honey warming kit is available and provides a thermostat, heating element and thermometer. If you have solidified honey, the whole comb will have to be removed from the frame and melted - the wax will form a solid cake on the surface of the honey and can be lifted off. If you have a lot of honey to process, it may be worthwhile investing in a melting tray such as the Easy-Bee or the Strainaway Filter System. A Pratley tray can cope with cappings, but not much more if overheating is not to be a problem. It is possible to scrape the comb down to the mid-rib rather than destroying the whole comb. Heating must be done carefully if the honey is not to be spoiled. The loss of volatile elements and the taste of caramel or wax do not enhance the flavour. In particular, the HMF level must not exceed the permitted level. HMF, 5-hydroxymethyl-2-furfuraldehyde, is a substance produced by the chemical breakdown of the sugar fructose in the presence of acids. The level of HMF increases with heating and storage time. Although generally believed to be harmless to the consumer, it is used as a measure of over-heating or age. However, Laurie Croft in *Honey and Health* (Thorsons Publishing Group) cites evidence suggesting that HMF is harmful to human health - and to bees. He also found that mass-produced honey had HMF levels well above the legal maximum - even though the UK was allowed twice the amount permitted in the EC - new regulations (September 2003) has reduced the HMF content from 80 ppm to 40 ppm. HMF is not peculiar to honey. Some jams, for example, contain very high quantities, perhaps 500 ppm or more.. If your honey is "Cold Pressed" you could use this as a selling point - it is more valid than "Organic Honey"! Similarly, the enzyme diastase is destroyed by heating and age and is used as an indicator of quality. Neither HMF nor diastase

can be analysed easily by the beekeeper - therefore, the heating of honey must be kept to a minimum. Honey that exceeds the limits for HMF or diastase can be sold only as *bakers honey* i.e. for general manufacturing purposes - at a lower price.

You can, of course, simply leave the supers of rape honey on the hives for the bees to consume. The experts tell you that this is not good practice. As the honey crystallises, a weak solution of sugar is left around the crystals. This, it is frequently stated, causes dysentery (diarrhoea). In addition the bees have to fly out to find water to dilute the solid honey, causing mortality if the weather is cold. Fortunately, bees do not read beekeeping books. I never used to admit to this heinous crime until I heard a well-respected speaker say that he always left a super of granulated honey on each hive as winter feed! I can only say that my bees winter well and show no signs of dysentery. I assume many wild colonies have similar stores. The best food for bees is the honey they produce for that purpose. There is a lot of moisture produced during the winter which they can utilise. It used to be standard practice to feed a block of candy during the winter until it became *unfashionable*. My bees always get a block of baker's fondant on Christmas Day when I wish them "Happy Christmas"! When preparing your bees for the winter, it is usually recommended that the queen excluder be removed in case the queen is left behind, when the cluster moves up into the super. I never seem to get around to removing excluders, but I don't think I have lost a queen because of "isolation starvation". It perhaps shows that the right management is the one that works for you - the bees that survive your management are the ones for you! An expert, after all, is simply x "the unknown quantity" and spurt "a drip under pressure"!

Rape honey can set to *knife bending* consistency, not liked by most customers - and it tastes gritty because of the coarse crystals. To produce a more acceptable product, the honey should be *creamed*:

Cool the strained honey to 75 deg F (24 deg C). Stir in a finely grained *seed* honey saved from a previous occasion. Mix thoroughly. Leave for 24 hours to allow air bubbles to escape and bottle. This used to be sold as *Creamed Honey* but I think the EC regulations insist that we now call it *Soft Set Honey* - because it does not contain cream!

When honey is allowed to granulate naturally in the jar *frosting* can occur. As the honey crystallises it shrinks and leaves a gap between the jar and the honey and displays the crystals. The honey remains wholesome but may look unattractive. To overcome this problem, one producer packages honey in dimpled glass to disguise the problem! The only solution is to re-liquefy the honey carefully. A microwave oven can be used for small quantities, but you will need to experiment - stir the contents in between periods of heating. Be careful the honey does not boil over the top of the jar!

If you are bottling extracted honey for your own use you may use cleaned jam jars etc, but you should buy standard jars if you sell your honey. Various shapes and sizes, in plastic and glass, are available. Fancy containers are also available. Whether you sell or give your honey away, it must comply with the food regulations. In particular, you must label your jars correctly. For example, a producer of "Heather Honey" was prosecuted successfully because it was shown that the honey so labelled was not predominantly heather honey - the bees had also collected nectar from a late crop of clover. Moorland Honey may be a safer description. However, if you state your honey is Heather Honey, Northamptonshire Honey, English Honey etc, such claims must be true. Apart from fraud such as adding corn syrup to honey, unscrupulous packers have been known to pack foreign honey as English Honey and sell at a higher price. However, each flower has pollen that is unique. If the pollen is extracted from a sample of honey, an expert (a melissopalynologist!) is able to deduce the source of the nectar - a large proportion of eucalyptus pollen in a sample of English honey would be highly suspect! If you depict a flower on your label, the honey must be predominantly from that source. Another beekeeper was fined for putting too much honey in the jar! The Food Act and EC regulations have in recent years caused concern among beekeepers - especially those who simply sell the odd jar of honey with no intention of making a living from their hobby. Nevertheless, whether you sell one jar of honey or tonnes (or give it away), the laws still apply - and the fines can be high. There remains some confusion over the intention, interpretation and application of the new regulations. Trading Standards Officers are always helpful and willing to advise. Your local association should be able to keep you up-to-date - they usually produce their own label to which you can add your name and address using a rubber stamp or an "Able Label". It is worth remembering that honey is a very safe food product. In experiments, bacteria (including those causing typhoid fever, chronic bronchopneumonia and dysentery) placed in honey were killed after a few hours.

In a good year you can expect at least 40-50 lb of honey from each colony - in a poor year, none at all and you may have to feed sugar to keep your bees alive. The latter makes it difficult to satisfy customers who want honey from bees that have not been fed "artificial" sugar. When beekeepers were given a special allowance of sugar during the Second World War, it was coloured green to prevent it getting onto the black market. It was then realised that bees move honey stores around the hive and green honey was on sale! It would be illegal to sell adulterated honey. In contrast, in America and Australia, for example, each colony might produce an average of 200 lb. In 1954, Rob Smith's hives sited in the Australian Karri Forest country averaged 629 lb. It is the reason why English honey is more expensive than imported honey - but it is the best! English honey should be marketed as a quality product. If customers are to be persuaded to buy English honey rather than cheaper imports, your honey must be processed properly and packaged attractively. Too often one sees poor quality honey on sale and prices that are too low. Less often one sees honey that is rather expensive, usually when sold in small containers or from "up-market" outlets.

Comb honey attracts a higher price as does 'chunk honey' - a piece of comb placed in a jar of honey. Both are only feasible if the honey does not granulate. The market for "enhanced" honey products has not been fully exploited eg honey with added pollen or "Royal Jelly". There is a good market for other hive products - wax can be sold in 1 oz blocks or made into candles, polish and hand cream. Propolis (used by Stradivarius in his violin varnish) is made into an antiseptic for sore throats. Beekeeping suppliers will buy wax and, sometimes, propolis. Customers sometimes request pollen and wax cappings. A pollen trap can be fitted to a hive and the collected pollen used in the spring to feed bees or processed for sale. Selling mead would require a license. Much more needs to be done to advertise and market hive products. Proper advertising can influence the demand for English honey. When rape honey first came on the market, it was not universally liked (even by the beekeepers) - customers now ask for rape honey - sometimes they even want rock hard honey rather than the honey that you have spent hours producing in a creamed state! Process and present your honey properly. Don't sell cheaply in glut years - the lean years will follow. Honey properly processed and stored in suitable sealed containers in cool conditions will keep without harm. Rather than selling your surplus cheaply, make mead and toast your good fortune! Sell at a price that takes into account your time, effort and costs. Your local association should be able to recommend a satisfactory price – remember, other beekeepers in your area will not benefit if you sell too cheaply.

A large-scale beekeeper was promoting British honey at a Food Fair in Hyde Park in London. He had considerable difficulty in convincing some potential customers from the Middle East that his honey was a quality product because he was selling it at £2 per pound. At home they expect to pay £20!

It is important to keep a record of income and expenditure, however small your sales. One beekeeper received a substantial tax demand based on the assumed profit from his hives - the onus was on the beekeeper to show that he did not owe tax. Bee prepared!