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Honey revisited: a reappraisal of honey in pre-industrial diets

BY KAREN A. ALLSOP AND JANETTE BRAND MILLER*

Human Nutrition Unit, Department of Biochemistry, University of Sydney, NSW, Australia

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In pre-industrial times, honey was the main source of concentrated sweetness in the diets of many peoples. There are no precise figures for per capita consumption during most periods in history because honey was part of either a hunter–gatherer or subsistence economy. Until now, historians and food writers have proposed that it was a scarce commodity available only to a wealthy few. We do know, however, that in a cash economy honey was sold in large units (gallons and even barrels) and it was present in such abundance that mead, made from honey, was a common alcoholic drink. A reappraisal of the evidence from the Stone Age, Antiquity, the Middle Ages and early Modern times suggests that ordinary people ate much larger quantities of honey than has previously been acknowledged. Intakes at various times during history may well have rivalled our current consumption of refined sugar. There are implications therefore for the role of sugar in modern diets. Refined sugar may not have displaced more nutrient-rich items from our present-day diets but only the nutritionally comparable food, honey.

Honey: Sugar: History

Honey... the word conveys images of warmth and nostalgia. 'Honey' is a name we keep for someone we love; honeyed words are flattering; a honeymoon is a time of hope and happiness. The honey we eat is often associated with goodness. It is thick, golden, clear and 'pure'. But more important than these qualities of texture and appearance, honey is sweet.

The desire for sweetness is innate in humans, and in some of our animal relatives too. Newborn infants, free from experience of punishment or reward, consistently choose to drink more of a sugar solution than of water alone (Naim & Kare, 1982). The same response has been observed in Macaque monkeys (*Macaca fuscata*; Sato *et al.* 1977). Sweetness is temptation. Speaking of the downfall of Adam and Eve, 'would forbidden vegetables be as convincing as the forbidden fruit?' (McGee, 1984).

In Western countries and industrialized societies we can indulge our desire for sweetness on a grand scale. The agent of this indulgence is cheap, plentiful sugar. The most accurate estimates suggest that 15–30 kg of refined sugars are eaten per year (40–80 g/d) by adults in industrialized nations (Glinsmann *et al.* 1986; Baghurst *et al.* 1989; Department of Health, 1989) compared with less than 1 kg/year of honey (Crane, 1975).

Many lay people believe honey has health-giving, magical properties. At the same time many of us have been told to believe that sugar is 'bad for us'. Apart from the problem of dental decay, nutritionists tell us that the problem with refined sugar is that of empty energy, that 'it tends to displace other more nutritious foods from the diet' (Passmore & Eastwood, 1986). But is this true? What of the time before sugar was known to us, when our only sweetener was honey? Nutritionally honey is little different from sugar, being basically a concentrated solution of fructose and glucose, with only physiologically insignificant traces of vitamins and minerals (Holland *et al.* 1991). Was honey in fact scarce, so that sweetness was, by necessity, an infrequent luxury, our diet consisting, as

* For reprints.

nutritionists suggest, entirely of nutrient-rich food items? Or was honey available in abundance? Were we then, as now, able to placate our cravings for sweetness so regularly that, even in those times, a significant proportion of our energy intake came from the empty energy of concentrated, simple sugars?

HONEY IN STONE-AGE DIETS

At Bicorp in eastern Spain is a place known as the Arana or Spider Cave. Its walls bear a painting of two human figures on a rope ladder ascending a cliff face (McGee, 1984). The figure at the top has one arm thrust into the cavity of a bees' nest, while the bees themselves hover around the entrance. His other hand holds what appears to be a basket, presumably to collect the spoils. The painting is 10000 years old and is the earliest firm evidence we have of honey-hunting by humans.

There are many other such paintings of raids on bees' nests, dating from this time onwards. Their large numbers may indicate that honey was highly valued by early humans, but cannot tell us anything of the amounts eaten. Nor does a honeycomb leave behind a permanent archaeological record in the way that carcasses leave bones to tell of their consumption. So, for quantitative data we must look instead to present-day hunter–gatherer peoples.

MODERN HUNTER–GATHERERS

Unfortunately, quantitative studies of hunter–gatherer diets are scarce. We know that for the Hazda of Tanzania 'meat plus honey' constitutes 20% by weight of food eaten (Woodburn, 1963). The remainder of the diet is of vegetable origin and so in energy terms 'meat plus honey' will contribute much more than 20%. The Mbuti pygmies of the Congo obtain as much as 80% of their dietary energy from honey during the honey season (Crane, 1983), but this lasts for only 2 months of the year (Turnbull, 1963).

The Veddas or Wild Men of Sri Lanka esteem honey so highly that they regularly risk their lives to obtain it (Crane, 1983). The local bees often nest in crevices on rock faces and these men will lower themselves into the ravine, suspended only by a bamboo ladder. The Veddas sometimes fill a hollow tree trunk with honey and then place flesh in it as a means of preserving the meat for times of scarcity. This is certainly suggestive of plentiful supplies of honey.

In the New World, the Guayaki Indians of Paraguay have honey as the very basis of their diet and culture (Crane, 1975). Vellard (1939; cited by Crane, 1975) reports that, 'one group of fifteen people had seven large vessels holding at least forty litres altogether.' Unfortunately we do not know how long this was to last them nor how many people were to partake of it.

Many Australian Aboriginal tribes regard the honey of the native bee as 'the supreme delicacy' (Low, 1989). In the rest of the world it is usually the males of a tribe who hunt for honey, but amongst some Australian Aborigines this task falls to the women. One method they employ involves capturing a bee and attaching a small feather to its body, so that on release it can be more easily seen and followed all the way back to the nest. On removing the contents, Australian Aborigines eat everything, honey, wax, dead bees and brood (which provides protein), with relish.

In 1972–3 Meehan lived for a year with the native Anbarra people of Northern Australia (Meehan, 1982). Over four 1-month periods, chosen to be representative of the different tropical seasons, she recorded the weights of foods consumed. The results indicated an average intake of 2 kg honey/person per year. However, Meehan points out that the wet season that year was unusually long and this may have diminished honey foraging activity.

In addition, this group of Anbarra had supplies of store food (providing 35–58% of dietary energy) including refined sugar, which may have reduced the incentive to go about the tricky and time-consuming activity of tracking down bees' nests.

The bees of the New World are stingless but may bite or burn with caustic liquids anyone who threatens the nest. Yet neither this nor the stings of Old World bees deter a hunter–gatherer in pursuit of honey. The amount of honey available from one region to the next will vary greatly depending on the extent to which the environment suits bee activity. The evidence suggests that the amount eaten by Stone-Age people was limited only by how much was available in their surroundings.

The Bushmen of South Africa lay claim to no personal possessions of any type, except that is for bees' nests (Free, 1982). Perhaps it was to reduce the likelihood of such a nest being robbed that a man first carried it, in its hollow log, back from the forest to a place near his dwelling. Perhaps that year was favourable for his bees, which in their excess numbers swarmed, coming finally to rest in a clay pot their owner had discarded in the grass, thus unknowingly inventing the first man-made hive.

HONEY IN ANCIENT CIVILIZATIONS

By 2400 BC the art of beekeeping was well established, in Egypt at least. Our evidence is a stone bas-relief from the Sun Temple of Ne-Woser-Re, not far from Cairo, which clearly depicts an apicultural scene (Darby *et al.* 1977). The first figure kneels beside a stack of clay hives and appears to be blowing smoke into them to calm the bees. The five other figures are busy pouring and possibly straining honey from the hives into vessels of varying size, and finally sealing the jars.

There are several similar scenes to be found on temple walls and in royal tombs. Sometimes, alongside the mummified remains of a Pharaoh, amongst the numerous provisions for the afterlife, can be found a jar or two of 3000-year-old honey (Darby *et al.* 1977). So, honey was important in Ancient Egypt, but was it plentiful?

We know that honey featured prominently in religious ceremonies and that, for example, in 1200 BC King Rameses III offered to the Nile god tens of thousands of jars, amounting to about 15 tonnes, of honey (Crane, 1975). One document mentions several hundred, and another, 5000 hives. A surviving marriage contract states, 'I take thee to wife... and promise to deliver to thee yearly twelve jars of honey', an amount which would come to about 6–13 kg per year (Ransome, 1937). Recall that present-day consumption of refined sugar is about 15–23 kg per year.

Some writers believe that for the Ancient Egyptians honey was a luxury item, sold at prices only the most wealthy could afford (Darby *et al.* 1977). The less well-off made do with concentrated fruit juices, especially date juice, as their sweetener. This idea is supported by records of rations given to those working to construct a monument in about 2100 BC. The 1000 manual workers received 'bread, vegetables and meat', whereas the king's messenger and standard bearer received, in addition, oil, fat, fish, wine, figs and honey. Again, in the 5th century BC, Herodotus wrote that the average Egyptian ate bread, barley, wine, fish and birds: there is no mention of honey, but another writer is of exactly the opposite opinion, stating that honey was widely available and to be found in all households of Ancient Egypt (Ransome, 1937).

Both points of view may be correct. The Ancient Egyptian civilization existed for several centuries before bee-keeping appears to have begun. Bees cannot survive in the desert, and in the limited fertile area of the Nile valley and delta, naturally-occurring nesting sites were probably few. The wild honey of the land may have been sufficient to have supplied a hunger–gatherer people plentifully, but was most probably insufficient for the much higher

population density of an agricultural community. Later, sometime before 2400 BC, apiculture was begun. Over time, an expansion of bee-keeping practices increased the amounts available so that prices fell and honey may have become widely available.

The records from which we reconstruct history are not evenly weighted between social classes. The wealthy, literate few are survived by their writings, artwork and buildings, while the poor leave us but few clues to the nature of their lives. We know that the rich of Ancient Egypt had honey in abundance. Perhaps the poor did too, but no records remain to tell us of this. The truth may be that honey was used by everyone.

The Ancient Greeks no doubt acquired a knowledge of bee-keeping from Egypt. Pythagoras is said to have lived largely on honey and bread; and the bodies of his countrymen who died some distance from home were sometimes preserved in honey (Free, 1982). These details give an impression of plenty.

The Egyptians used honey in their spiced breads, cakes and pastries, and for priming beer and wine (Tannahill, 1975). In Ancient Rome one could enjoy honey in a still wider range of dishes. In salad dressings honey balanced the acidity of the vinegar (Crane, 1975) and it was a necessary ingredient of many sauces. Wines drunk at the beginning and end of meals were sweetened with honey; and meat, fruit and vegetables were sometimes preserved by immersion in it (Free, 1982). Half of the 468-odd recipes in a late Roman cookery book, credited to Apicius, call for honey as an ingredient (Style, 1992). Refined sugar was known and used in medicines, but had no place in cooking (Wilson, 1973).

Far from the Mediterranean, Ancient China is known to have imported honey. One official was granted on his retirement in AD 500 a quart of white honey each month (Crane, 1975). This amounts to just over 19 kg of honey per year but we cannot know if this is in any way indicative of the level of consumption in the general community at that time.

In late Bronze Age Britain, beeswax was an important commodity since it was required for bronze casting (Wilson, 1973). Of course, large volumes of wax had the pleasant concomitance of large volumes of honey, and the Britons were pleased to make wide use of it in their food.

While we know much of the politics and warfare of the ancient civilizations, information on everyday issues is more difficult to come by. We have little in the way of quantitative data about their diets and must instead make do with impressionistic evidence. From this it appears that, with the possible exception of the early years of the Ancient Egyptian civilization, honey was very widely available and widely consumed during this period of human history.

HONEY IN MEDIEVAL EUROPE (AD 450–1485)

The banquets held by the nobility of the Middle Ages were spectacular affairs. Huge numbers of guests in fine apparel would partake of a truly vast array of exotic dishes served on silver platters (Cosman, 1976). On reading surviving bills of fare from such occasions, the modern mind is staggered at the scale of provision and the variety of foods offered. Any type of dish might be sweetened with honey including appetizers, soups, cheese and fish dishes, roast meats and vegetables. But such feasts are hardly representative of the everyday food habits of that time. In fact, when we look to contemporaneous household accounts we find scarcely a mention of honey; and where such an entry does exist, it is small in quantity relative to the size of household. For example, the household accounts of the English household of Dame Alice de Bryene from the year 1412–13 record that the establishment consumed 6·5 quarts of honey (Wilson, 1973). This gives the forty-strong household a per capita consumption of just 0·3 kg/year. Similarly, trade accounts only occasionally show purchases or sales of honey or beehives, although where these do occur the units of sale are large, often gallons (Rogers, 1866).

From this evidence historians and others have concluded that honey was not widely used in medieval times. Crane (1975) speculates that a typical per capita consumption would have been about 2 kg/year and Free (1982) believes honey 'was not extensively used in cooking in Medieval Europe'. Rogers (1866) expresses his surprise that bees were not more commonly kept since an occupied hive was the only agricultural commodity which could double in value over a year.

Mertes (1988), in a recent work, discusses the role of vegetables in the diet at this time. They too appear but occasionally in extant accounts and until now historians have declared that, in Britain at least, vegetables were disdained by all throughout the Middle Ages. However, Mertes points out that vegetables eaten on the manor would have been grown on the manor, and so would not have been entered into the accounts. They were in all likelihood eaten in large amounts, because they were 'free', and the previous assumptions of other historians may be completely false.

It seems likely that honey has, historically, suffered the same fate. In fact we know that the medieval manor frequently employed a bee-keeper to tend to hives on-site (Wilson, 1973). The lower classes too must often have kept bees for their family's use, but no record of this could be expected to remain. In a case such as the de Bryene household, the volumes of honey recorded may have been bought in simply to supplement a poor yield from the home hives that year.

This new interpretation of old evidence sits neatly beside other relevant information. We know, for instance, that in Ireland in about AD 440 honey was stored in three types of jar. When full, the smallest could be lifted over the head, the middle one up to the chest and the largest to waist height only (Free, 1982). It would seem unlikely that a scarce commodity would be stored in units of this size.

A garden near the border of Flanders in AD 800 is recorded to have produced three muids of honey, i.e. a little less than a tonne, in 1 year (Crane, 1980). A document of the same date tells us that a manor near Rheims, France, possessed twenty-one beehives.

In England in about AD 1350, honey cost approximately 7 pence per gallon (equivalent to 1·3 pence/kg) (Rogers, 1866). This was much less than one would expect if it was a scarce and highly prized food item. The same volume of butter fetched a similar price (Rogers, 1866). This dairy product is often described as having been most abundant and cheap, being used not only in many areas of cookery, but also as a general emollient and lubricant (Mertes, 1988). If similarity in price can be assumed to indicate similarity in extent of usage, then the implication is that honey was in great abundance. Furthermore, an item used only in small amounts would not have been sold by the gallon. In the same period, that other sweetener, refined sugar, at 3 shillings/kg (Rogers, 1866), was about thirty times the price of honey.

Rents were sometimes exacted in the form of honey. Leominster Priory in England required from eight tenants a combined total of 19·5 gallons each year (Webb, 1854, 1855). We do not know if this honey was sold off. If it was kept and added to supplies from any hives belonging to the priory, the resident clergy would certainly have been amply supplied. In fact, most European monasteries and abbeys of the time kept bees, though not primarily for the honey. The bee was seen as an industrious, selfless worker for the greater good, who, in addition, was chaste. (It was then believed that bees reproduced asexually.) As such, its pure white and relatively odourless wax was considered far more suitable for the manufacture of church candles than animal fats (Free, 1982). Of course, this practice had the effect of further boosting honey production.

Mead was an alcoholic drink made by fermenting the final washings of honey from the comb in a solution with water. Although it is almost unknown today, it was very widely enjoyed from the very early Middle Ages until as late as the 17th century (McGee, 1984),

especially in those areas where grapes were not available to produce grape wines (Tannahill, 1975). Large quantities of honey must have been available just to meet the demand for this beverage. (Of course, in this form honey was not acting as a sweetener as such.) We know, for example, that in the German city of Meissen in AD 1015 mead was used to extinguish a fire since this was available in greater volume than water (Crane, 1980).

Twenty years after his Conquest of England in 1066, the Norman king William I directed his commissioners to go to every English county under his rule and obtain full details of the land, people and farming there. The result of these efforts is known as the Domesday Book. In the eastern counties, details of livestock, including beehives, were recorded and compiled. The total numbers of hives mentioned in Norfolk, Suffolk and Essex were 421, 350 and 599 respectively (Darby, 1952). At first sight we might think to combine these figures with the population data, and an estimate of yield per hive, to provide us with a figure for per capita consumption. If we look a little closer, however, we will find this cannot be done, for the commissioners recorded only that livestock on demesne land, i.e. land retained by the lord for use directly by the manor. Those beehives, and there must have been many, that were owned by peasants were not recorded. So the total figures quoted above are gross underestimates, and again a reliable figure for per capita consumption of honey eludes us.

We will probably never know how much honey the ordinary person living in the Middle Ages consumed. It was part of a subsistence economy which is forever lost to us. What we can conclude, however, is that far more was eaten than historians have previously assumed on the basis of evidence from household accounts. If we consider the low cost of production of honey, and the strong human predilection for sweetness, this is perhaps not so surprising.

HONEY IN THE BRITISH DIET FROM AD 1485 ONWARDS

The diary of Anne Hughes, a farmer's wife, provides us with a fascinating and charming account of honey-getting in the 18th century (Hughes, 1981). 'We did have a bussie time takeing the honey from the bees yester night... Sarah did dig a big hole in the ground for each skeppe [hive], where in we put a sulfur paper which we did set alight, and put the skeppes of bees on the topp. The smell of the sulfur do kill the bees, and so we do get the honey therfrom. It do grief me to kill the poor things... but we do want the honey, *useing a great lot of the hous for divers things.*' (Our italics.)

Hartley (1975), too, speaks in a way suggestive of abundant honey supplies, when she says of the years before 1700, 'the large amount of honey and wax used in old households is astonishing... Almost every small household kept their own bees.'

This impressionistic evidence stands in agreement with the information from the accounts of this period, i.e. 1485–1700. These show that when honey was sold it was generally by the gallon, firkin (8 gallons), or even, sometimes, by the barrel (about 32 gallons), units unlikely to be used for a scarce commodity in only occasional use. The price was still low and Rogers (1882, 1887) comments that this would have been possible only if beekeeping was a very common practice.

Another writer, however, holds the view that until industrial times, sweetened foods were little known, and offers the menu lists and accounts of food purchases from an English household of the 1550s as evidence of this (Crane, 1975). But it is not always possible to predict whether a dish is savoury or sweet from the title assigned to it on a menu. Certainly today one expects that a meat or cheese dish will usually be savoury. But, as we saw in the Middle Ages, this has not always been the way, and we should not, therefore, make such an assumption about dishes in Tudor times. In fact, at that time, meat and fish dishes and the pastry lids of 'savoury' pies might often be sweetened (Wilson, 1973).

Furthermore, the accounts of many other English households of this period consistently reveal a great indulgence in sweetened foods but the sweetening agent here was not honey. Household accounts were kept only by the wealthy, and the contemporary abundance of honey referred to earlier was enjoyed by the ordinary folk who constituted the bulk of the population. By contrast, the rich were now satisfying their sweet tooth with costly refined sugar.

It was in the 11th century that the Crusaders, on their way to the Holy Land, had encountered sugar cane and, perhaps consequent to their enthusiasm, that sugar was, for the first time, traded to Europe from its lands of origin in the East (Wilson, 1973). It was very costly and was sold in small quantities, in the same way as the spices of that time. But by the late 13th century the wealthiest households were starting to replace honey with sugar.

It is a much more straightforward business to enquire about sugar consumption than honey consumption in pre-industrial times. All sugar supplies, in Europe, came from imports, so customs records constitute a readily accessible record of national consumption. In the 1520s the dissolution of the monasteries reduced demand for beeswax for church candles and brought about a small decrease in the production of honey. Almost simultaneous with this came an increase in the supply of sugar, imported from the new European colonies. Sugar was still considerably more expensive than honey, but this combination of events gained it a more complete following among the wealthy. Many it seems were even indulging to excess, for in 1598 a foreign visitor remarked of Queen Elizabeth that her 'teeth [were] black, a defect which the English seem subject to from their too great use of sugar' (Best, 1986). Cookery books were used exclusively by the well-to-do at this time and clearly illustrate that, for this section of society, sugar had, by the 1550s, usurped honey's place in the diet.

It was not until the early 1700s, however, when the supply of sugar boomed, its price fell, and coffee, tea and chocolate entered the British diet, that ordinary people finally began to buy significant amounts, so that the per capita consumption reached 1·8 kg/year (McGee, 1984). The change over from honey to sugar occurred more gradually in rural areas than in the cities. Just 80 years later, sugar consumption had trebled to reach 5·4 kg per capita per year. Honey was no longer the standard sweetening agent.

From this point sugar consumption rose inexorably, while honey consumption declined. Bee-keeping ceased to be the general custom that it had been in former years, there was no longer a hive in every garden.

CONCLUSION

For the greater part of this millennium honey appears to have been a plentiful, everyday food, whilst sugar was a luxury commodity of which only the wealthy might partake. From 1850 very significant advances were made in bee-keeping and hive technology and yields per hive rose. Despite this, honey is today the more expensive item, often eaten as a special treat, whilst sugar is the ubiquitous sweetener and everyday food. To paraphrase Crane (1975) 'time has effected a reversal that is both curious and complete'.

We will never have precise figures for honey consumption per capita during most periods of human history. It would be wrong, however, to conclude that it was always a scarce commodity available to a wealthy few. In fact, our reappraisal of the evidence suggests that ordinary people ate much larger quantities of honey than has previously been acknowledged. Intakes at various times during history may well have rivalled our current consumption of refined sugar. It should be emphasized, of course, that these conclusions are based on qualitative rather than quantitative evidence (but then so was the belief that honey was scarce). Many nutritional beliefs are based on dogma rather than scientific

evidence. Our reappraisal of honey in human diets has implications for the natural role of sugar in modern diets. Refined sugar may not have displaced more nutrient-rich items from our present-day diets, but only the nutritionally comparable food, honey.

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