

## HONEY AND DIABETES

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Is honey good to be consumed by diabetics?

Is it recommended or counterindicated in this affection?

Does honey (or specific honeys) play any role in the treatment of diabetes mellitus (honey diabetes)?

These questions are permanently asked both by our readers in letters to us, as well as at various meetings on apitherapy held in France and abroad.

We therefore thought it useful and even absolutely necessary to elucidate this problem once and for all, in the light of the latest scientific knowledge, in order to eliminate earlier, generally accepted claims which generate unfortunate misunderstandings and sometimes even serious errors; we wish to help, in this way, the many beekeepers and other people, who are more or less concerned with the role of the bee products in preserving man's health.

It is true that honey is an excellent natural, energy-giving food with nutritive properties, also having certain therapeutical properties thanks to which it may be used in treating sub-acute and chronic affections, but this does not mean that it is a product good for everything.

It is true that honey is a natural food, precisely the earliest in the world, being in general not detrimental and well tolerated by healthy people, but this does not mean that it may not be counterindicated in certain pathological affections.

Such an affection is the diabetes mellitus.

In order to better understand this problem, we must first briefly describe the diabetes and the composition of honey.

### 1. Honey diabetes

*Honey diabetes is a chronic disease caused by disorder in the metabolism of sugars and manifest hyperglycemia (high glucose content in blood), which may be complicated with many degenerative affections (most of all vascular), with infections, nervous disorders, and above all with acidotic coma.*

*The causes of honey diabetes are in general unknown:*

- In a number of diabetics, a lesion of the pancreas, hypophysis, or of suprarenal glands exists, which might be a cause, but most often no anatomical lesion is involved; in such cases the mechanism of diabetes is unknown. The only fact known is that in diabetics, glucose does not penetrate fully into cells (especially in the muscular cells) which results in hypoglycemia.
- The only significant etiologic factor is the frequent heredity of diabetes.

*Honey diabetes is characterized by:*

- three significant clinical symptoms
  - polydypsia, or excessive thirst
  - polyuria or excessive discharge of urine
  - polyphagia or excessive desire for food
- two significant biological symptoms
  - glucosuria or presence of glucose in urine
  - hyperglycemia or increase of the content of glucose in blood (the normal average being about 1g/litre)

The treatment of honey diabetes includes:

- diet, indispensable irrespective of the type of diabetes, mainly aimed at limiting the amount of sugars and elimination of very sweet foods (which, because of fast absorption have a brutal effect on glycemia);

- hypoglycemic drugs:
  - *insulin* (which is destroyed by gastric juices and therefore it must be injected);
  - *synthesis hypoglycemic drugs* (of several types), which wed the advantage of being active when administered orally.

## 2. Composition of honey

In summary, honey consists of:

- Water ..... 18-20%
- Sugars .....75-80%
- Proteins .....0.4%
- Lipids .....0.1%
- Minerals and oligoements .....0.1%
- Vitamins .....
- Enzymes .....
- Various other substances .....

The sugars in honey, important by their content ranging between 75 and 80% are mostly (70%) represented by *glucose* (or dextrose), and by levulose (or *fructose*).

The content of each of the two sugars varies depending on the origin of honey, ranging between 1/1 and 1/1.6 (1% glucose – 1.6% levulose), which means 30% glucose and 40% levulose.

Worth mentioning is also that the sweetening value of the two sugars is greatly different, those of levulose being higher than that of glucose (about twice higher).

We shall now discuss the precise possibilities of using honey, especially that rich in fructose (levulose) by people suffering from honey diabetes.

To this end, first, we shall discuss a number of elements related to the metabolism of fructose in the body, the insufficient knowledge about which has generated, in a certain period, hopes for using honey in dietetics, fact which was a source of serious confusion for diabetics and is so still today.

Because insulin is only little or at all involved in the metabolism of fructose it was assumed that diabetics may consume an unlimited amount of fructose. But, facts are much more complex, and here are given the essential aspects as reported in the latest research publications in the domain.

*The digestive absorption of fructose* its twice slower than that of glucose, which recommends it for use by diabetics; but its assimilation by the body is twice faster, which partially invalidates the former advantage.

*Most of fructose is turned* into glucose when passing through the intestinal mucous membrane, which results in its complete absorption. While in a healthy man 30% fructose is turned into glucose, in diabetics up to 80% fructose is turned into glucose, depending on the seriousness of the disease.

*Fructose is mainly used* in the synthesis of triglicerides which may speed up formation of atheroma (chronic lesion of arteries, manifest by formation of yellowish plates, on the inner walls of arteries, containing deposits of lipids, which is the first symptom of atherosclerosis), and serious vascular complications in people susceptible to such complications precisely because of being diabetic.

Fructose releases 4 calories/g (one gram of fructose releases 4 calories) which is quite significant when considering the restriction in the diet of obese diabetics, which must be accurately calculated in respect of the calories necessary for maintaining a normal weight.

The fundamental data were summarized by Prof. H. BOUR of Hotel-Dieu, Paris, when he answered the question:

Is fructose useful to diabetics?

The importance of fructose is relatively moderate on the one hand because of its turning into glucose, and on the other hand because of the incorporation of its residues into the metabolism of lipids which results in increased amounts of sugars and lipids.

*Consequently*, by considering all these elements, we may state that *honey*, which contains on an average 30% glucose, 40% fructose and a little sucrose, *cannot by any means be recommended to diabetics*; it may be included in the diet of diabetics only within the limits of the amount of sugars permitted to be consumed for maintaining the balance required by their disease; it may by no means be included in the diet for enriching it.

*Worth mentioning* is also the fact that fructose is not a drug to control honey diabetes; its prolonged use has no favourable influence on the development of certain complications of the disease (especially lesions of the retina).

*It consequently results that no honey* (not even those very rich in fructose) can be in itself used a *fortiori* in the therapy of diabetes, irrespective of the clinical type of the disease.

We hope that this brief report, required for several years, will put an end to the misunderstandings in this respect, for many beekeepers, to the benefit of the diabetics who will thus be given useful and efficient advice.