

Research regarding honey mineral intake

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Abstract The aim of the study is to make a comparative evaluation of three types of honey (acacia honey, lime honey and polyflower honey), under the aspect of their contribution of recommended values of minerals in the daily diet. Honey, by its composition, is a complete product that can provide a good part of the vitamins and minerals needed by the human body. Literature data show that the distribution of mineral elements varies widely, depending mainly on the botanical origin of honey, the pedoclimatic conditions as well as the degree of soil pollution. Using the concentrations of the determined mineral elements and the recommended values, we calculated the intakes of minerals for a daily consumption of 100g honey. Our results show that acacia honey brings the highest intake of Cu and Zn and the lime honey brings the highest iron intake. Although all types of honey contain high levels of manganese, polyflower honey brings the largest Mn contribution compared to the other two types of honey studied. Regarding Ca and Mg intakes, they are similar for all types of honey. The obtained results entitle us to affirm that honey can be considered as a mineralizing food, however, unfortunately not to a large extent, due to the limitation of consumption because of the high carbohydrate content and the caloric load.

Key words

acacia honey, lime honey and polyflower honey, minerals, human nutrition

Honey, by its composition, is a complete product that can provide a good part of the vitamins and minerals needed by the human body. Compared to vitamins, minerals during food processing, are not destroyed by mixing with other substances, exposure to air, or extreme heat. Once ingested, they do not undergo any modification, however, it should be noted that by boiling, some of the minerals can be lost due to their solubilization in water.

Literature data show that the distribution of mineral elements varies widely, depending mainly on the botanical origin of honey, the pedoclimatic conditions as well as the degree of soil pollution [1].

Calcium is the most abundant mineral in the body and accounts for about 2% of a person's total body. Calcium is present in foods rich in dairy products and in some vegetables. Calcium deficiency can lead to osteoporosis.

Magnesium is the sixth most abundant mineral in the body and the last of the main minerals. It works together with calcium to help with muscle contraction, blood clotting and blood pressure regulation.

Iron is the most abundant mineral, found in foods rich in protein, and helps proteins take, transport and release oxygen throughout the body. Iron deficiency in the body leads to anemia.

Zinc assists with the enzymatic reactions required in blood clotting and is essential for taste, seeing and wound healing. Sodium provides more zinc than any other food.

Copper stains hair and skin and helps to form the shield around the nerve fibers. Copper sources include crustaceans, legumes, and whole grains.

Manganese assists in bone formation and metabolic functions. It is found in nuts, whole grains, leafy vegetables and tea.

Due to its composition in biologically active substances, honey consumption has beneficial effects. Honey has antiseptic, antimicrobial and antifungal properties, properties due to increased sugar content, along with other factors, such as low pH, presence of hydrogen peroxide, flavonoids, phenols, terpenes, etc. We can not conclude enumeration of the benefits of honey consumption without mentioning the mineral contribution due to the content in the macro and essential microelements because it is known that the mineral deficiency in the body is a public health problem [2,4,5,6,7].

Material and Methods

The honey samples were taken in 2016 from romanian local producers, from unpolluted areas.

The honey mineral content was determined by atomic absorption spectrometry, using the spectrophotometer by flame atomic absorption type Varian 240 FS.

Using the concentrations of the determined mineral elements (table 2) and the recommended values of Ca, Mg, Fe, Mn, Zn and Cu in the daily diet

(table 1), we have calculated the intakes of minerals for daily consumption of 100g honey (~ 325 calories)[14]. The daily Recommended intakes for individuals elements by „Food and Nutrition Board, Institute of Medicine, National Academies of Sciences” is presented in table 1.

Table 1

	Ca	Mg	Fe	Mn	Zn	Cu
Men	1000	400	8	2.3	11	0.9
Women	1000	320	18	1.8	8	0.9

Results and Discussions

The mean values of honey mineral content registered in our study are presented in table 2.

Table 2

Honey type	Ca	Mg	Fe	Mn	Zn	Cu
Acacia	18.10±2.21	6,91±1.17	1.12 ± 0.3	0.48±0.11	2.19±0.78	0.36±0.4
Lime	57.5±2.16	15.75±0.35	4.32±1.08	1.27±0.23	2.04±0.36	0.27±0.08
Polyflower	50.3±2.49	17.16±0.69	5.03±1.74	2.42±0.68	4,6±1.06	0.16±0.04

The results obtained in determining the mineral intake in the recommended daily diet under the experimental conditions described above are graphically illustrated in figures 1-3.

From the three types of honey studied, we can conclude that acacia honey brings the highest intake of Cu and Zn.

We observe in figure 2 that lime honey brings the highest iron intake.

Although all types of honey contain high levels of manganese, polyflower honey brings the largest Mn contribution compared to the other two types of honey studied (figure 3).

We can conclude regarding the Ca and Mg intakes, that they are similar in the case of the studied types of honey.

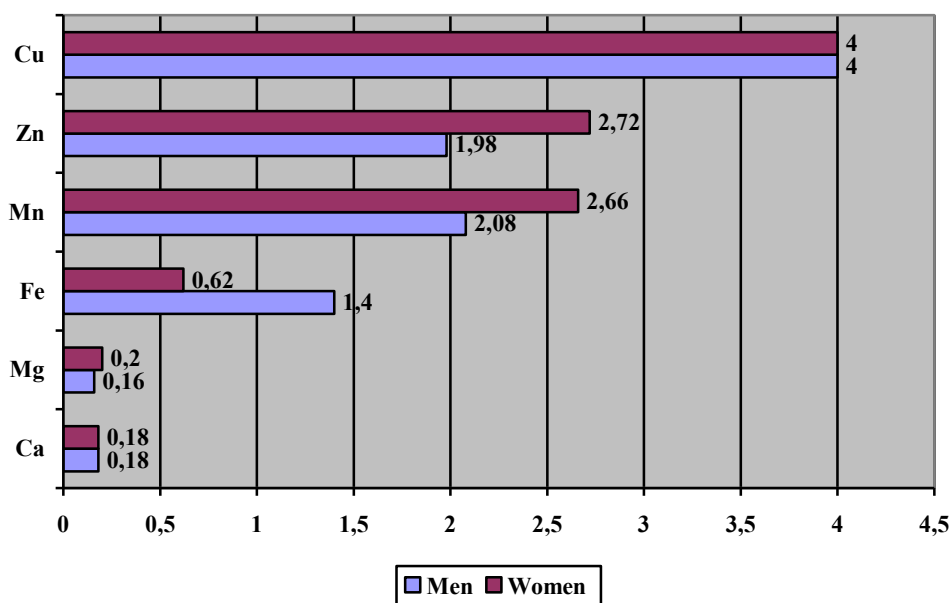


Figure 1. Supply of minerals (% of daily recommended intakes) for 100 g of acacia honey

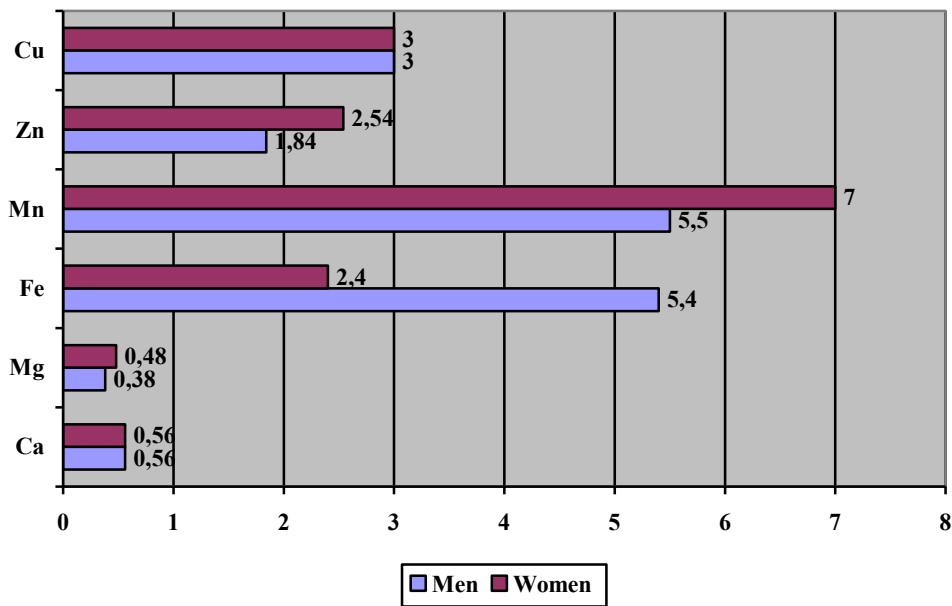


Figure 2. Supply of minerals (% of daily recommended intakes) for 100 g of lime honey

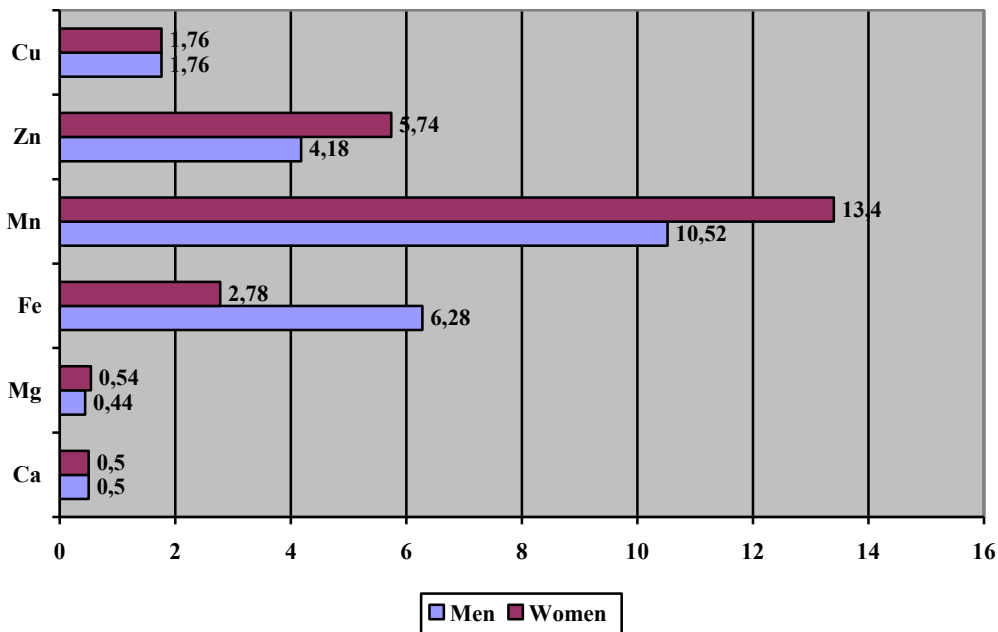


Figure 3. Supply of minerals (% of daily recommended intakes) for 100 g of polyflower honey

Conclusions

The results of the coverage of the daily mineral requirement by consumption of this product show that acacia honey brings the highest intake of Cu and Zn, lime honey has the highest intake of Fe and polyflower honey brings the highest Mn intake (10.52 % for males and 13.4 % for females).

Regarding Ca and Mg intakes, they are similar in all types of honey.

The obtained results entitle us to affirm that honey is a product that brings significant benefits to the

body through the intake of minerals. As such, it can be considered as a mineralizing food, however, unfortunately not to a large extent, due to the limitation of consumption due to the high carbohydrate content and the caloric load.

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