

## Determination of some of the quality parameters for honey produced in Timis County and commercialized in the local market

Gheorghita Simion<sup>1\*</sup>, Daniela Micu<sup>1</sup>, Alexandra Trif<sup>2</sup>, Lăcrămioara Damiescu<sup>1</sup>

<sup>1</sup>Sanitary Veterinary and Food Safety Directorate, Timș, Martir Caceu No.4, 300585, Timișoara, Romania

<sup>2</sup>Faculty of Veterinary Medicine Timișoara, Calea Aradului No. 119, 300645, Timișoara, Romania

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### Abstract

Researches were made to establish the quality of honeys produced in Timis county and soled on the local market in 2010. 19 samples from four different assortments (polyfloral, acacia, lime and rape), were analyzed. The analyzed parameters were: water content, free acidity and hydroxymethylfurfurol. The obtained results emphasized that the average values of physico-chemical parameters studied were below National or European maximum permitted level..

**Keywords:** honey, quality, water content, parameters

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### 1. Introduction

In terms of food hygiene and health, honey is a natural food extracted from honeycombs which were capped by the bees for at  $\frac{3}{4}$  of their area [2]. From the market's point of view, the honey is understood as the product as it was extracted from the comb [1]. If placed on the market as honey or used in any product intended for human consumption, honey must meet certain characteristics: it should not provide foreign tastes or odors, should not be in the process of fermentation, should not have acidity artificially present or subjected to a heating process, so the natural enzymes have been either destroyed or significantly inactivated [8]. Water content of honey is limited to 20% in general, a higher water content prone to fermentation and decreases nutritional value of honey. After extraction, the water content of honey can be changed depending on storage conditions [1, 5, 9].

An important indicator in assessing the freshness of honey is hydroxymethylfurfurol (HMF), which in the first months after extraction from the comb is

low (0.1 - 0.4 mg/100 g) and during the long-term storage, its value may gradually increase up to 1mg / 100g product or more [1]. A small amount of HMF can be formed in ripened honey, if it is subjected to a brutal heat treatment. National legislation through the Order 522/2003 allowed a content of maximum 40 mg / kg of honey, and the value is set by European legislation, exception has baker's honey industry - hydroxymethylfurfurol content may not exceed 80 mg / kg [7]. A content of maximum 80 mg / kg HMF is allowed if honey origins are declared from regions with tropical climate and blends of these honeys.

The degree of freshness of honey is appreciated by acidity. Acidity is the basic chemical parameter that allows a certain differentiation between the alcoholic fermentation and the acetic fermentation (the alcoholic fermentation does not significantly alter the acidity of honey) [5,9]. European legislation provides for the free acidity, in general, maximum 50 milliequivalents / kg for honey and a maximum of 80 meq / kg used in food industry [7].

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\* Corresponding author: e-mail: [gelisimion@yahoo.com](mailto:gelisimion@yahoo.com)

## 2. Materials and methods

Researches were made to evaluate the levels of physico-chemical parameters for a total of 19 samples of four kinds of honey (seven samples of polyfloral, five samples of acacia, four samples of lime, three samples of rape). Honey samples were collected from individual beekeepers in Timis county that sell honey in specific markets and exhibitions organized locally in 2010 and were analyzed in the Sanitary Veterinary and Food Safety Laboratory from Timisoara.

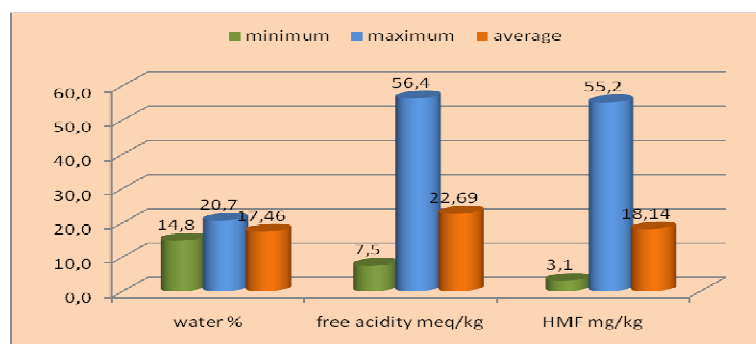
All parameters were determined according to STAS 784/3-2009 as follows: water content was determined by refractometry; free acidity by titration; hydroxymethylfurfural using Winkler's method. The results were expressed as follows: water content, percentage; acidity, meq / kg (ml NaOH 1N/100 g% × 10); hydroxymethylfurfural, mg / kg honey.

## 3. Results and Discussion

The results of physico-chemical parameters, determined from honey samples are presented in table 1 and figure 1.

**Table 1.** Physico-chemical parameters of honey samples analyzed in 2010

Sample no.	Type of honey	Water content (%)	Free acidity (meq/kg)	HMF (mg/kg)
1.	Polyfloral	16.9	32.5	28.9
2.	Polyfloral	17.5	15.0	23.3
3.	Polyfloral	15.9	51.1	4.8
4.	Polyfloral	18.1	12.9	9.7
5.	Polyfloral	19.7	<b>56.4</b>	35.0
6.	Polyfloral	14.8	25.0	15.6
7.	Polyfloral	16.5	30.5	38.9
8.	Acacia	19.7	17.0	10.5
9.	Acacia	15.3	9.0	11.2
10.	Acacia	15.9	7.5	7.6
11.	Acacia	15.6	12.3	6.6
12.	Acacia	16.7	9.0	13.9
13.	Lime	17.2	15.5	20.4
14.	Lime	<b>20.1</b>	14.5	11.5
15.	Lime	16.7	33.5	<b>55.2</b>
16.	Lime	18.1	23.0	27.5
17.	Rape	17.4	18.8	11.2
18.	Rape	18.9	21.0	9.8
19.	Rape	<b>20.7</b>	26.7	3.1
Minimum values		14.8	7.5	3.1
Maximum values		20.7	56.4	55.2
Average		17.46	22.69	18.14



**Figure 1.** The level of physico-chemical parameters from analyzed honey samples

Except for two samples (one sample of lime honey and one sample of rape honey), all the honey samples had water content below 20%; with average value of 17.46%, a value lower than that obtained by Malika et al. [5]. There were similar results found by Conti et al. [4] for Italian honeys and this confirms that the fermentation rate is very low in the analyzed samples.

The values for free acidity ranged between 7.5 and 56.4 meq / kg with an average value of 22.69 meq / kg. The minimum value of free acidity was recorded in a sample of acacia honey and the maximum value was detected in a sample of polyfloral honey. The HMF content in honey samples had values which ranged between 3.1-55.2 mg / kg with an average value of 18.14 mg / kg. The values obtained, excepted one lime honey sample, were lower than those obtained by Borkovcová et al. [2].

#### 4. Conclusion

The study emphasizes that the average values of analyzed physico-chemical parameters were below the maximum permitted level limits set by National and European legislation, and confirms the appropriate quality of the honey produced in the Timis county, and commercialized in the local market in 2010.

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