



Assessing Honey Quality in the Context of Global Regulatory Standards

What looks like simple honey is actually a chemically complex product judged by strict global standards and understanding how honey is tested reveals the hidden science behind its purity, safety and value.

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Introduction

Natural bee honey is a sweet product produced by honeybees *Apis Mellifera* both of the nectar of plants and of insect excreta in the act of sucking the juice out of live parts of plants or in the excrement of live parts of plants. Those are combined with certain secretions of bees, and kept in honeycombs, where they are evaporated, and left to dry.

"International standards allows a maximum 40mg/kg of HMF in honey, yet over 90% of raw samples contain less than 30mg/kg, that highlights how freshness and proper storage directly define quality."

Techniques in Evaluation of Bee Honey Quality

The natural bee honey has been under study in several decades. Nonetheless, it continues to impress scientists at its prophylactic, nutritional and biological action. Thus, the methods allowing examining its quality are constantly adjusted and enhanced with the purpose to decrease the time of analysis, this way getting rid of costly and dangerous reagents.

Variety of Honey

The general method of defining the diversity of bee honey is the melissopalynological method. This method allows to establish the proportion of the prevailing pollen grains in a given honey, on which the name of the honey type is given, with the given name being the name of a plant or plants characterized by the botanical name of those plants. The technique also enables detection of bad honeys. [1] This methodology took into consideration cost effectiveness and reduction of the time and lesser toxic procedures needed to prepare the researcher. The aim of the study is, therefore, to study the various melissopalynological procedures were applied on the samples with alien, blue dye, basic fuchsin and the traditional acetolysis methodology without dye. Once the pollen samples have been prepared, pollen samples were observed under an optical microscope, and identified as different botanical families such as fabaceae, malvaceae, myrtaceae bignoniaceae etc.



Hydroxymethylfurfural Content

This significant quality factor in honey is an indication of honey freshness and overheating. In fresh honeys almost none, but results in increased storage, based on the pH of the honey, and on storage temperature. Germany, Italy, Spain, Austria, and some other European federation of beekeepers sell a portion of their honey as quality honey, with no more than 15mg/kg. in foreign markets, with a maximum of 40mg/kg having proved acceptable. In long-term routine honey control at the IHA during the last 10 years, more than 90% of the raw honey samples (30000) and more than 85% of the retail one samples (2000) had less than 30mg HMF/kg. The Codex recommendation of a larger maximum value of higher maximum is pegged on the fact that HMF is raised during storing of honey in countries with warm climates. The new standard proposal by the EU is a maximum of 40mg/kg because in the European conditions this standard has been found to be acceptable. In this case, as in the case of diastase, the two norms differ significantly: whereas the norm of Codex includes honey following its processing and blending, the EU norm corresponds to the entire life of the retail honey. As a matter of fact, this implies that EU norm is significantly harsher than the Codex norm since HMF is bound to rise on storage.

Sugars

One of the explanations of the classification of the botanical organ of the natural bee honey may be the carbohydrate structure of it, which may lead to its classification in the right way directly and indirectly. Enzymatic hydrolysis and transglycosylation process is involved in sugar is honey production. High performance liquid chromatography with infrared is used to determine the content of fructose, glucose sucrose and sugars like maltose, turanose, erlose, raffinose, melezitose and isomaltose. The identification of the peaks is determined by the standards of their retention times and heights. Detection bars column and detector must be thermostated to 30 o C. Outputs are conveyed in g/100g. The total quantity of glucose and fructose must not be less than 60/100g. of sucrose must not exceed 5g/100g, except acacia (*Robinia pseudoacacia* L.). The fructose: glucose ratio in honeydew honey is normally higher than that in nectar honey. Moreover, there is the melecytosis, the sugar, present in honey honeies only. Additional tests that have been recommended to ascertain the sugar content of the bee honey would be those that involve gas chromatography and HPLC with the pulsed amperometric detection. Under the GC method sugars are silylated and quantification done on the derivative fraction. Internal standard of Mannitol is employed. The latter technique is premised on the fact that sugars act as extremely weak acids at high PH levels. They are either fully ionized or they are partially ionized and thus they can be separated through the ion exchange activity.

Water

Picking of unripe honey will create the situation where it is overly high in water. This will cause faster fermentation as a result of microbial development, including *Zygosaccharomyces*. When collected in higher layers by water, honey is thinned, foams, and acquires an acidic odor, as well as a typical taste. On the other hand, yeast from the genus *Toruplopsis* cause fermentation which is manifested, for example by honey leaking form its packaging. Honey is competent to microoganisms development in samples above water content of 17. Refractometry determines the moisture content of honey. This value is established when the honey is melted at 50 o C before it is allowed to cool to the room temperature. This method is based on the fact that the refractive index measurements form the principle of determination of water content in honey. The greater the percentage solids, the greater is the refractive index. This is shown as a result in g/100g. In the European Union countries, the demands depend on the rule according to which the water content of



honey cannot exceed 20g/100g except baker's and heather honey (norm: not more than 23g/100g) and baker honey made of heather (norm not more than 25g/100g).

Solubility Unattainable Matter and Contaminants

Bee honey impurities may be added to the end product during preparation and packaging. The cause of insolubility can be a poor procedure of straining honey when extracting it out of honeycombs. In this process, the bee product which is being extracted through the honey extractor does go through a sequence of sieves. Solvents that are insoluble in water found in honey, form the residue of honey after filtration of honey solution. The residue is dried at temperature of 135 oC., till constant weight is obtained. The outcome will be in percent of weight. The maximum amount of insoluble constituents in honey is 0.1g/100g, except pressed honey (Norm: up to 0.5g/100g).

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