



To investigate the effect of long-term storage on the physicochemical properties of honey

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Abstract

The freshness of food is of great importance to the consumer. To investigate the effect of long-term storage on the physicochemical properties of honey, 6 polyfloral samples were stored at ambient temperature for 12 months and their chemical properties including, hydroxymethylfurfural, diastase number, sugar content (glucose, fructose, and sucrose), and proline were determined periodically (3 month interval). The hydroxymethylfurfural and sugars content were determined by high performance liquid chromatography. Results showed that dramatic changes were observed after 9 and 12 months storage in the chemical and biochemical characteristics of honey samples. The average values of determined specifications of 6 honey samples after 12 months were as follows: hydroxymethylfurfural 74.2 ± 0.1 to 753.5 ± 1.2 mg/kg, diastase 3.2 ± 0.5 to 18.1 ± 0.2 , Proline 219.3 ± 1.6 to 507.0 ± 2.2 mg/kg, glucose from 15.6 ± 1.2 to 25.4 ± 1.2 (%), fructose 18.3 ± 1.7 to 27.6 ± 1.3 (%), and sucrose 0.4 ± 0.3 to 4.2 ± 0.5 (%).

The current study revealed that hydroxymethylfurfural values in all of the samples were higher than standard limit after one year storage. Although sugars, proline, and diastase showed a wide range of variation in entire polyfloral honey samples during long-term storage, some of them were still in accordance with the standard range recommended by the Codex Alimentarius.

Therefore these specifications cannot be used to determine the freshness of honey since: 1) their initial levels in honey samples are very different (depends on the type of honey and other factors), 2) their changing behavior during storage is not consistent; which make them unreliable parameters for determining the freshness of polyfloral honey.

Keywords: Honey, Diastase number, Long-term storage, Proline, sugars, hydroxymethylfurfural (HMF)