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Effect of high pressure and temperature on the physicochemical properties of heather honey

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Honey is natural sweet substance produced by *Apis mellifera*, which is consumed as a high nutritive value food. The physicochemical quality criteria of honey are well specified by the European Legislation (EC Directive 2001/110) [1]. The quality properties of honey can be diminished by the influence of heating in the thermal pasteurization of honey [2]. As an alternative to conventional thermal pasteurization, the non-thermal high pressure processing has potential to produce safety food with similar characteristics to the raw unprocessed foods [3].

Therefore, the purpose of this work was to study the effect of three treatments: 1) high pressure (725 MPa for 10 minutes); 2) high pressure with temperature (725 MPa for 10 minutes at temperature of 50 °C); and 3) thermal treatment (75 °C for 5 minutes) on the physicochemical parameters (moisture, pH, electrical conductivity, free acidity, diastase activity and hydroxymethylfurfural content) of a Portuguese heather honey.

The results obtained for several physicochemical parameters were significantly different among the samples under the different treatments, for instance, the HMF content. This parameter, widely recognized as indicator of honeys' freshness [4], depends on several factors, such as temperature, time of heating and storage conditions [5]. The value of HMF in the raw honey was $5,5 \pm 0,5$ mg.kg⁻¹ of honey (EU limit is 40 mg.kg⁻¹), ensuring that it was a fresh product that has not been subjected to heating or inadequate storing conditions. Concerning the treatments, the ANOVA results showed that the amounts of HMF did differ significantly (P-value= 0.0315). The thermal treatment significantly increased the HMF concentration comparing with the raw honey (P-value= 0.0355). The preliminary results did not show significant increase in the HMF content when high pressure processing, with and without temperature, were applied. Further studies should be performed to confirm that high pressure processing has no adverse effect on the honey quality.

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