INFLUENCE OF HIGH PRESSURE HOMOGENIZATION ON PHYSICAL STABILITY AND COLOUR OF TOMATO JUICE

Mirian Tiaki Kaneiwa KUBO¹, Pedro Esteves Duarte AUGUSTO², Marcelo CRISTIANINI¹

¹ Department of Food Technology (DTA), School of Food Engineering (FEA), University of Campinas (UNICAMP), Brazil
² Technical School of Campinas (COTUCA), University of Campinas (UNICAMP), Brazil

High pressure homogenization (HPH) is an emerging technology that can be used to cause desirable changes in liquid foods. Tomato-based products are suspensions consisting of cells and cell wall material dispersed and arranged in a liquid matrix phase. Fruit juice physical stability and colour are primary factors considered by the consumer in assessing juice quality and sensory acceptance. The aim of this work was to evaluate the influence of HPH on the physical stability and colour of tomato juice. Samples were treated by HPH up to 100 MPa and analyzed for particle size distribution (PSD), turbidity and colour. Independent of the homogenization pressure (P_H) evaluated, laser scattering analysis indicated a monomodal PSD. The mean particle size decreased and the size distribution narrowed with increase in the P_H. In accordance with the PSD, turbidity values decreased with P_H (R²=0.98), since smaller particles provide greater light passage through the sample. Hunter colour values (L*, a*, b*, C*) showed an increasing and non-linear behaviour and were modelled as a function of the P_H (R²>0.98). The magnitude of the total colour difference (ΔE) indicated a significant colour variation (p <0.05) of all homogenized samples in relation to unprocessed one. Therefore, HPH did not only effectively reduce the size of particles and its distribution, resulting in an improvement in physical stability by reduction of the sedimentation rate, but also released pigments such as lycopene, leading to a greater uniformity of the colour.

Keywords: high pressure homogenization, stability, colour, tomato juice.

Acknowledgments: The authors thank the São Paulo Research Foundation (FAPESP) for funding projects no. 2010/05241-8, 2010/05240-1 and 2011/09220-8.