

EFFECT OF HIGH PRESSURE PROCESSING ON ORGANIC ACIDS AND ANTIOXIDANT ACTIVITY OF PREBIOTIC JUICES

GOMES, W. F.¹; ALMEIDA, F. D. L.¹; CAVALCANTE, R. S.¹; TIWARI, B. K.², BARRAGÁN, O. R.¹; FERNANDES, F. A. N.¹; RODRIGUES, S.¹

¹Universidade Federal do Ceará, Fortaleza, Brazil; ²Teagasc Food Research Centre, Dublin, Ireland; profwgomes@hotmail.com

Prebiotic compounds have been used in several food products. Fruits and fruit juices can be used as vehicles for these compounds. Some studies have reported the fortification of selected fruit juice beverages with fructooligosaccharides [1]. However, thermal technologies used to processing and preservation of the juices to extend their shelf life may cause changes in functional molecules, vitamins and other nutrients [2]. Among these technologies, high pressure processing (HPP) is reported as a good emerging non-thermal food processing that guarantees food preservation at safe standards maintaining, as much as possible, the fresh-like characteristics of foods [3]. Therefore, the objective of this research is to investigate the effect of HPP on organic acids and antioxidant activity of prebiotic juices. Orange juice and apple juice (Squeeze©, Fruit Juices Ltd, Ireland) was purchased from a local supermarket (Dunnes, Dublin-Ireland) and maintained at 4 °C before use. The juices containing prebiotic ingredients were prepared by adding of 7% (w/v) of commercial fructooligosaccharide (ORAFIT© P95, Beneo GmbH, Mann, Germany) in a liter of the juice. HPP was carried out using industrial equipment (Hiberbaric 300). Prebiotic juices were packed at 250 mL polyethylene bottles, which were placed in polyethylene plastic bags, and vacuum sealed for the high pressure processing. High Performance Liquid Chromatographic (HPLC) analysis was used to qualify and quantify the organic acids. For evaluation of antioxidant activity were assayed by FRAP, DDPH and ABTS methods. An increase of citric acid (from 6.7 g/L to 10.4 g/L) and vitamin C (from 3.5 g/100mL to 5.0 g/100mL) was observed in orange juice. In apple juice, citric acid increased from 1.6 g/L to 1.9 g/L and malic acid from 2.1 g/L to 3.8 g/L. The juice without processing was used as control sample. For antioxidant activity ascorbic acid and trolox were used as standards and no significant differences were observed in the antioxidant activity of prebiotic juices after HPP. The application of high pressure shown to be particularly interesting on the prebiotic juices. Unlike thermal processes, this process does not degrade the organic acids, making it viable for the functional foods processing.

[1] Renuka, B., Kulkarni, S. G., Vijayanand, P. and Prapulla, S. G. 2009. Fructooligosaccharide Fortification of Selected Fruit Juice Beverages: Effect on the Quality Characteristics. *LWT - Food Science and Technology*. 42: 1031-33.

[2] Vervoort, L., Planckena, I. V. D., Grauweta, T., Timmermans, R. A. H., Mastwijkb, H. C., Matserb, A. M., Hendrickxa, M. E. and Loey, A. V. 2011. Comparing Equivalent Thermal, High Pressure and Pulsed Electric Field Processes for Mild Pasteurization of Orange Juice. *Innovative Food Science & Emerging Technologies*. 12: 466-77.

[3] Ramos, B., Miller, F.A., Brandão, T.R.S., Teixeira, P. and Silva, C.L.M. 2013. Fresh fruits and vegetables - An overview on applied methodologies to improve its quality and safety. *Innovative Food Science & Emerging Technologies*. 20: 1-15.