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Enhancing the quality parameters and extending the shelf life of pomegranate juice by High Hydrostatic Pressure (HHP) processing against thermal treatment

Effect of HHP processing (200, 300, 400 MPa; 5, 15, 25°C; 5 and 10 minutes) against traditional thermal treatment at 85°C/10 min on antioxidant activity, total phenolic content, total monomeric anthocyanin concentration, ascorbic acid content, mannitol content, color values (ΔE) as well as total mesophilic aerobic bacteria (TMAB) and total yeast and mold (TYM) in freshly squeezed pomegranate juice was investigated. HHP combinations around 400 MPa at 10 min at every temperature studied was sufficient to decrease TMAB and TYM counts more than 4.0 log cycles proving microbial stability and safety. Additionally, HHP showed no significant decrease in antioxidant activity, total phenolic content and monomeric anthocyanin pigment concentrations of the freshly squeezed juices, while there was a significant decrease ($p < 0.05$) in conventional thermal treated (at 85°C/10 min) ones. In shelf life study HHP treatments extended the storage period up to 30 days at 4°C with stable antioxidant and ascorbic acid levels and higher sensory approval in terms of odor and appearance over pasteurized samples. These results provide information of storage stability of pomegranate juice after pressure treatments, which is quite scarce. In database collected, criteria for commercial production of high quality, healthy pomegranate juice with safety requirements could be established.

Biography

Hami Alpas served as a "Visiting Scholar" in 1996 and 1998 at University of Wyoming, USA; as a "Visiting Scientist" in 2001 and 2002 at Ohio State University, USA and as a "Visiting Professor" in 2006, 2007 and 2008 at University of Bordeaux I, France. His main research areas are: unit operations in food engineering, non-thermal food processing technologies, food quality, food safety and food security through total food protection. He is an expert in High Hydrostatic Pressure treatment of foods. He has supervised 5 PhDs and 12 MSc theses. He has 76 international journal articles (SCI) and over 1000 citations (ISI-Web of Sci. h-factor 20) as well as close to 60 academic presentations in 40 different international meetings. He has completed 15 national, 4 international projects including EU/JRC, CNRS-EGIDE and NATO ARW/ATC, EU-FP7 projects. He has authored 10 chapters in internationally edited books and has edited 3 international books by Springer.

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