

21st International Conference on

Food Technology & Processing

October 04-06, 2018 | London, UK

Comparison of high hydrostatic pressure and thermal processing on the nutritional and sensorial quality of vegetables

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Statement of the Problem: There is an increasing consumer's demand for minimally processed vegetables with high quality aspects, since the consumption of these products is related with good health. In response to that demand, non-thermal techniques, as High Hydrostatic Pressure (HHP) are regarded with special interest by the food industry to offer innovative products due its potential to provide safe and fresh like products, overcoming traditional thermal processing disadvantages reported on food quality.

Orientation: Attending to the growing consumer awareness towards minimal processed products and the need for food industry of developing new products, the effects of HHP and High Pressure & High Temperature (HPHT) on several nutritional, health promoting compounds and quality components of several red and green vegetables have been studied. Results were compared to those obtained for traditional Thermal Treatments (TT) for pasteurization and sterilization according to an equivalence criterion for a correct comparison.

Findings: In the sterilization study, HPHT helped to preserve the carotenoids and consequently color in both carrot slices and tomato puree while vitamin C content was increased. The TT decreased levels of carotenoids, vitamin C, affected negatively to the color and to other properties like Total Polyphenol Content (TPC) and Antioxidant Capacity (AC). For the pasteurized products, the HHP process preserved carotenoid and chlorophyll content in both broccoli and green pepper. The TT increased the carotenoid availability while it affected negatively to the chlorophyll content and therefore to the color of the products. Vitamin C, TPC and AC were increased or preserved with the TT while vitamin C was affected negatively by the HHP process for both vegetables.

Conclusion: It seems that HPHT technologies can provide sterilized products with general better nutritional, organoleptic and quality characteristics than the conventional TTs. However, there is no general conclusion about its advantages in pasteurization. Vegetal structure seems to play an important role in the observed effects, so each product should be studied in detail.

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