

Effect of various food processing and handling methods on preservation of natural antioxidants in fruits and vegetables

ABSTRACT

Bioactive compounds from plant sources are generally categorized as natural antioxidants with well-known health benefits. The health-promoting characteristics of natural antioxidants include anti-inflammatory, anti-diabetic, and hepatic effects as well as free radical scavenging. Herein, a comprehensive and comparative review are presented about the effects of conventional (thermal and mechanical) and relatively new (non-thermal) processing methods on phytochemicals and discussed the importance of implementing the use of those methods that could be of very helpful retaining the quality of the bioactive compounds in plant-based foods. Plant-based foods rich in phenolics, vitamin C, carotenoids, and other compounds undergo a range of processing operations before they are consumed. Most of these methods involve thermal treatments of fruits, stems, leaves, and roots. These techniques have varying effects on bioactive compounds and their activities, and the magnitude of these effects depends on process parameters such as temperature, time, and the food matrix. Thermal processing can be detrimental to bioactive compounds while nonthermal procedures may not cause significant deterioration of important health-promoting phytochemicals and in some cases can improve their bio-activity and bio-availability. The detrimental effects of conventional processing on the quality of natural antioxidants have been compared to the effects of innovative nonthermal food treatments such as gamma and ultraviolet irradiation, ultraviolet light, pulsed electric fields, and high hydrostatic pressure.