

The Nexus of Postharvest, food processing, nutrition, malnutrition and climate change

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Climate change is already hurting the availability of food because of decreased yields and lost land from erosion, desertification and rising seas, among other things. Sustainable nutrition and food security are a major global challenge. The global food system does not yet provide adequate calories or nutrition to everyone on the planet, yet it enables some populations to overconsume. In the coming decades, while global agriculture must produce more food to feed a growing population, advancing research in postharvest handling and processing may mitigate challenges of nutritional insecurity issues in the era of climate change.

Fruits and vegetables are rich sources of micronutrients, macronutrients and health promoting compounds. Epidemiological studies show inverse associations between a diet rich in fruits and vegetables and risk of certain cancers, cardiovascular disease, diabetes and stroke. They are also a major source of dietary fiber, which influence the gut microbiota composition, thereby regulating several metabolic pathways through symbiotic host-microbiome signaling. Due to their limited shelf life and perishable nature of fruit and vegetables, postharvest handling and food processing plays a critical role in reducing the postharvest loss and improving food quality. Recently, the demand of the processed foods with enhanced health benefits phytonutrients has increased and it has been commercially implemented worldwide, for preserving meats, vegetable products, seafood, and other foods, and several high pressure processing (HPP) fruit juices are available in the market. These minimally processing techniques will influence the stability, bioavailability and bioaccessibility of the bioactive components. Moreover, common household processing techniques such as blending, squeezing, and juicing techniques influence the levels of phytochemicals. For example, juicing and blending of grapefruits showed significantly higher levels of ascorbic acid and citric acid, respectively. Similarly, blended grapefruit juice showed higher levels of flavonoids. In another study, thermal processed kale, beet and melon juices showed higher total phenolics and antioxidant activity than the cold-pressed juices. This may be due to thermal processing might have cleaved sugar moiety in flavonoid glycosides in kale and melon juices to get more free hydroxyl groups, which will increase the total phenolics and radical scavenging activities. This presentation will include the evidences for health promoting effects of plant products, isolated compounds which have been processed through various minimally processing techniques. This study was supported by United States Department of Agriculture-NIFA-SCRI- 2017-51181-26834 through National Center of Excellence for Melon at the Vegetable and Fruit Improvement Center of Texas A&M University.