

Title Effect of postharvest conditions and treatments on health-related quality of vegetables and fruits

Author G.B. Bengtsson

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Abstract

There is convincing evidence that a large intake of vegetables and fruits reduces the risk of several chronic diseases. The health-promoting effects could be due to bioactive phytochemicals in addition to nutrients. Experiments with cell cultures, animal models and humans have revealed several bioactivities. A direct antioxidant effect in the body may be insignificant for phytochemicals that are antioxidants in vitro. Instead, health-promoting phytochemicals can act by other mechanisms, e.g., change activity of enzymes in drug metabolism, modulate signalling pathways, inhibit tumour growth or initiate apoptosis in cancer cells. The beneficial intake levels of various phytochemicals are not yet known. For intake calculations and dietary recommendations, it is important to know the effect of pre- and post-harvest conditions and treatments on the final levels before ingestion. In general vegetables and fruits lose their content of vitamin C postharvest, and more so during suboptimum conditions. Glucosinolates and dietary fibre are relatively stable, whereas phenolic constituents and carotenoids vary in behaviour depending upon species, ripening stage and the specific compound. Atmospheres with lowered O₂ and elevated CO₂ concentration reduce the loss rate of vitamin C and can change the storage behaviour of several constituents such as flavonols and anthocyanins. The effect of incident light postharvest is little investigated, but increases in phenolics are possible. Non-bruising mechanical stress could also be of significance, but very few results are available. Furthermore, the level of constituents at harvest can affect the storage behaviour. It is usually not possible to assess health-related quality of vegetables and fruits by our senses. Therefore, rapid and non-destructive methods to assess health-related properties are needed. Only a few methods have been developed so far.