



Effects of the food supply chain on glucosinolate hydrolysis and formation of bioactive isothiocyanates



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Abstract

Glucosinolates are phytochemicals present in Brassica vegetables that are precursors to health promoting isothiocyanates among others which are formed by myrosinase induced hydrolysis. Isothiocyanates are have antibacterial, anti-inflammatory and cancer preventive properties. However due to specifier protein activity, many Brassica vegetables often release mainly nitriles and epithionitriles during enzymatic hydrolysis. which are less health-promoting effects. Environmental factors during plant growth, but also storage and food processing strongly affect the outcome of glucosinolate hydrolysis, which will impact beneficial effects from Brassica consumption. For example, summer growth conditions (high light, temperature) can induce isothiocyanate formation in red cabbage compared to cabbage grown in autumn. Food preparation such as salad preparation and cooking severely affects the levels of glucosinolates and the formation of their bioactive degradation products, which is due to its effects on hydrolysis enzymes as well as on the thermal stability of glucosinolates and its follow-up products. The underlying mechanisms will be discussed and strategies to increase isothiocyanate formation in Brassica vegetables will be presented.

