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Comparison of health-relevant flavonoids in commonly consumed cranberry products

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Abstract

The human health benefits from consumption of cranberry products have been associated with the fruits' unique flavonoid composition, including a complex profile of anthocyanins and proanthocyanidins. However, when processed by techniques such as pressing, canning, concentrating, or drying, a number of these natural components may be compromised or inactivated due to physical separation, thermal degradation, or oxidation. Fresh cranberries were compared to freeze-dried berries and individual fruit tissues (skin and peeled fruit). Products examined included cranberry juices (commercial and prepared from concentrate), cranberry sauces (commercial and homemade), and sweetened-dried cranberries (commercial). Freeze-drying resulted in no detectable losses of anthocyanins or proanthocyanidins from cranberry fruits. Anthocyanins were localized in the skin. Proanthocyanins were higher in the skin than in the flesh, with the exception of procyanidin A-2 dimer which was concentrated in the flesh. Anthocyanins were significantly higher in not-from-concentrate juice than in reconstituted juice from concentrate (8.3 mg and 4.2 mg/100 mL, respectively). Similarly, proanthocyanidins were markedly higher in not-from-concentrate juice compared to juice from concentrate (23.0 mg and 8.9 mg/100 mL, respectively). Homemade sauce contained far higher anthocyanins and proanthocyanidins (15.9 and 87.9 mg/100 g, respectively) than canned sauces processed with whole berries (9.6 and 54.4 mg/100 g, respectively) or jelled-type (1.1 and 16 mg/100 g, respectively). Sweetened-dried cranberries were quite low in anthocyanins (7.9 mg/100 g), but they still retained considerable proanthocyanidins (64.2 mg/100 g). Commercially processed products contained significantly lower levels of polyphenols as compared to fresh and home-processed preparations. Anthocyanins were more sensitive to degradation than proanthocyanidins.

Practical application: As cranberry juices and other products are increasingly consumed for their recognized health benefits (including prophylaxis against urinary tract infection), it is relevant to consider how various degrees of commercial and home processing can alter innate levels of the biologically active flavonoids (especially anthocyanins and proanthocyanidins) characteristic to the intact fruits.

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