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The inhibitory effects of berry polyphenols on digestive enzymes

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Abstract

The evidence for the effect of polyphenol components of berries on digestive enzymes is reviewed. Anthocyanins inhibit alpha-glucosidase activity and can reduce blood glucose levels after starch-rich meals, a proven clinical therapy for controlling type II diabetes. Ellagitannins inhibit alpha-amylase activity and there is potential for synergistic effects on starch degradation after ingestion of berries such as raspberries and strawberries, which contain substantial amounts of ellagitannins and anthocyanins. A range of berry polyphenols (e.g. flavonols, anthocyanidins, ellagitannins and proanthocyanidins) can inhibit protease activities at levels which could affect protein digestion in the gastrointestinal tract. In contrast, potential for the inhibition of gastrointestinal lipase activity, a proven therapeutic target for the control of obesity through reduced fat digestion, may be limited to proanthocyanidins. Taking into account the manifold possible synergies for inhibition of starch, protein and/or lipid digestion by the spectrum of polyphenol components present within berry species, the inhibition of digestive enzymes by dietary polyphenols may represent an under-reported mechanism for delivering some of the health benefits attributed to a diet rich in fruit and vegetables.

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