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The cardiovascular health benefits of apples: whole fruit vs. isolated compounds

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Abstract:

Background: Apples are an important contributor to the intake of dietary components linked with cardiovascular disease (CVD) prevention. Apples have been shown to have beneficial effects on vascular function, blood pressure, lipids, inflammation and hyperglycaemia. The cardioprotective effects of apples, and other fruits, have been primarily ascribed to their high polyphenol content. There is emerging evidence that the bioavailability and bioefficacy of polyphenols is affected by the food matrix in which they are consumed.

Scope and approach: This review will discuss the differences in the consumption of apple as a whole food in comparison to the consumption of isolated key components, predominantly polyphenols and fibre. The bioavailability and absorption of major apple polyphenols, such as procyanidins, catechin, epicatechin, phloridzin, chlorogenic acid, and the quercetin glycosides, will be described. The methods by which apples may ameliorate risk factors for CVD will be discussed and results from key human intervention studies conferred. The list of studies described in this paper is exemplary and not exhaustive.

Key findings and conclusions: There are a number of factors influencing the bioavailability of polyphenols in an individual including colonic microbial composition, the dose consumed and the presence of other polyphenols and macronutrients within the food matrix. There is evidence of a synergistic relationship between the fibre and flavonoids found in a whole apple, which is likely mediated in part by the gut microbiota. Further human intervention studies investigating the effects of apples of cardiovascular risk factors, and the critical role of the gut microbiota, are warranted.