Food matrix effects of polyphenol bioaccessibility from almond skin during simulated human digestion.

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Abstract:
The goal of the present study was to quantify the rate and extent of polyphenols released in the gastrointestinal tract (GIT) from natural (NS) and blanched (BS) almond skins. A dynamic gastric model of digestion which provides a realistic simulation of the human stomach was used. In order to establish the effect of a food matrix on polyphenols bioaccessibility, NS and BS were either digested in water (WT) or incorporated into home-made biscuits (HB), crisp-bread (CB) and full-fat milk (FM). Phenolic acids were the most bioaccessible class (68.5% release from NS and 64.7% from BS). WT increased the release of flavan-3-ols ($p < 0.05$) and flavonols ($p < 0.05$) from NS after gastric plus duodenal digestion, whereas CB and HB were better vehicles for BS. FM lowered the % recovery of polyphenols, the free total phenols and the antioxidant status in the digestion medium, indicating that phenolic compounds could bind protein present in the food matrix. The release of bioactives from almond skins could explain the beneficial effects associated with almond consumption.