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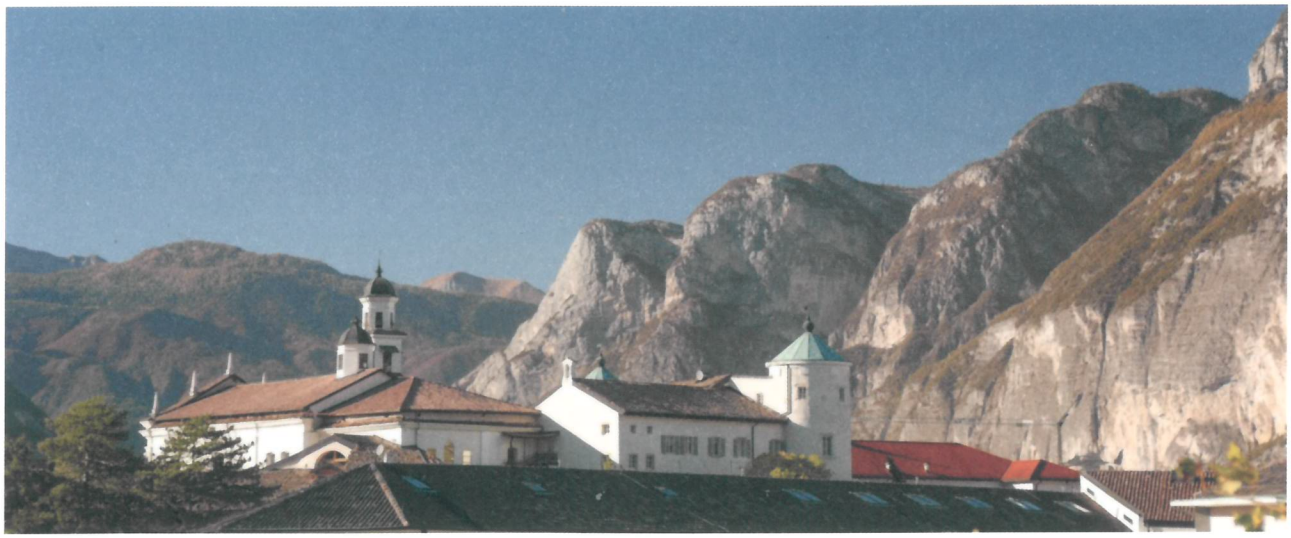

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Increase of gut-protection bioactivity induced by wild strawberry anthocyanins after *in vivo* digestion

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Berries are one of the most consumed sources of bioactive polyphenols, including anthocyanins, and these compounds exert protective effects against initiation of colorectal cancer (CRC) by reducing DNA damage. Some varieties of freshly collected wild strawberry can reach up to 200mg/100g of anthocyanins. We hypothesised that physiologically relevant levels of Italian wild strawberry metabolites exiting the ileum would be both bioavailable and would exert positive effects on gut health. Five ileostomists completed a wild strawberry feeding study (11/NI/0112), ileal fluid was collected pre (0 h) and post (8 h) consumption of strawberries (225 g) and assessed for phytochemical composition by LCMSn. We simulated the interaction of the ileal fluids with colonic microbiota over a 24 h period (0, 5,10, 24 hr) using in vitro gut fermenter models. Nutri-kinetic analysis using LCMSn demonstrated significant increases in the concentration of gut microbiota-mediated polyphenolic metabolites over time. While changes in the bacterial composition of the gut fermenter models were monitored using fluorescent in situ hybridisation analysis with validated probes for Total bacteria, Bifidobacterium genus, *Clostridium histolyticum/perfringens* group, *Faecalibacterium prausnitzii*, Eubacterium rectale group, *Bacteroides*, Lactobacilli and Enterobacteria; limited changes observed. Bioactivity of the post-berry consumption ileal fermentates was assessed on two colonocyte cell lines (HT29 and CCD841 CON (normal)) using COMET assay. Post-berry ileal fermentate from all five ileostomists significantly ($p<0.01$) decreased DNA damage in both HT29 cells and CCD841 cells compared to untreated controls. To conclude, strawberry phytochemicals were available for colonic fermentation following ileal digestion and human microbiota-mediated fermentation which subsequently increased overall levels of polyphenolic metabolites, the post berry fermentates were demonstrated to reduce DNA damage in colonocytes.

Notes