

Broccoli consumption affects the human gastrointestinal microbiota.

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The human gastrointestinal microbiota is increasingly linked to health outcomes; however, our understanding of how specific foods alter the microbiota is limited. Cruciferous vegetables such as broccoli are a good source of dietary fiber and phytonutrients, including glucosinolates, which can be metabolized by gastrointestinal microbes. This study aimed to determine the impact of broccoli consumption on the gastrointestinal microbiota of healthy adults.

A controlled feeding, randomized, crossover study consisting of two 18-day treatment periods separated by a 24-day washout was conducted in healthy adults (n=18). Participants were fed at weight maintenance with the intervention period diet including 200 g of cooked broccoli and 20 g of raw daikon radish per day.

Fecal samples were collected at baseline and at the end of each treatment period for microbial analysis. Beta diversity analysis indicated that bacterial communities were impacted by treatment (P=.03).

Broccoli consumption decreased the relative abundance of Firmicutes by 9% compared to control (P=.05), increased the relative abundance of Bacteroidetes by 10% compared to control (P=.03) and increased Bacteroides by 8% relative to control (P=.02). Furthermore, the effects were strongest among participants with body mass index <26 kg/m², and within this group, there were associations between bacterial relative abundance and glucosinolate metabolites.

Functional prediction revealed that broccoli consumption increased the pathways involved in the functions of the endocrine system (P=.05), transport and catabolism (P=.04), and energy metabolism (P=.01). These results reveal that broccoli consumption affects the composition and function of the human gastrointestinal microbiota.