

**Almond Consumption and Processing Affects the Composition of the Gastrointestinal Microbiota of Healthy Adult Men and Women: A Randomized Controlled Trial.**

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**Abstract:**

Background: Almond processing has been shown to differentially impact metabolizable energy; however, the effect of food form on the gastrointestinal microbiota is under-investigated. Objective: We aimed to assess the interrelationship of almond consumption and processing on the gastrointestinal microbiota. Design: A controlled-feeding, randomized, five-period, crossover study with washouts between diet periods was conducted in healthy adults (n = 18). Treatments included: (1) zero servings/day of almonds (control); (2) 1.5 servings (42 g)/day of whole almonds; (3) 1.5 servings/day of whole, roasted almonds; (4) 1.5 servings/day of roasted, chopped almonds; and (5) 1.5 servings/day of almond butter. Fecal samples were collected at the end of each three-week diet period. Results: Almond consumption increased the relative abundances of *Lachnospira*, *Roseburia*, and *Dialister* ( $p \leq 0.05$ ). Comparisons between control and the four almond treatments revealed that chopped almonds increased *Lachnospira*, *Roseburia*, and *Oscillospira* compared to control ( $p < 0.05$ ), while whole almonds increased *Dialister* compared to control ( $p = 0.007$ ). There were no differences between almond butter and control. Conclusions: These results reveal that almond consumption induced changes in the microbial community composition of the human gastrointestinal microbiota. Furthermore, the degree of almond processing (e.g., roasting, chopping, and grinding into butter) differentially impacted the relative abundances of bacterial genera.

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