

## **The Impact of Aspartame on Human Gut Microbiota: A Review**

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### **Structured Abstract**

**Background:** Artificial sweeteners, notably aspartame, are popular as low-calorie substitutes for traditional sweeteners but the function of the gut microbiota has not been adequately studied. The purpose of this review is to synthesize an overview of evidence regarding aspartame's effects on the human gut microbiota. The main issues to address in this study are whether aspartame consumption is linked to particular bacterial species that are associated with gut dysbiosis, the adverse impact of aspartame on human health and the gut microbiome, and the possibility of aspartame altering the diversity and composition of the gut microbiota.

**Methods:** The inclusion criteria restricted the research to humans and excluded those that focused on animal or gut microbiota effects of artificial sweeteners. After a thorough analysis of 14 of the 93 records from online databases such as PubMed, Google Scholar and ScienceDirect, 4 of the studies were deemed eligible for inclusion. This critical review points to significant study gaps, especially concerning the processes through which aspartame impacts the microbiological balance of the gut.

**Results:** This study demonstrates that aspartame's effects on specific bacterial taxa, such as *Prevotella*, *Roseburia*, and *Faecalibacterium*, differ amongst research. Some research indicates a drop in Bacteroidetes genera such as *Prevotella*, while others show an increase in Firmicutes genera such as *Roseburia* and *Faecalibacterium*. The disparities in findings are mostly due to variances in research approaches, such as study design, sample size, and sequencing techniques.

**Conclusion:** Aspartame consumption appears to impact gut microbiota composition, perhaps leading to dysbiosis and metabolic health. However, due to inconsistent research methodology and a lack of long-term studies, reaching definitive results remains difficult. To further understand the microbiological and health implications of aspartame ingestion, future research should focus on standardised methodology, greater sample sizes, and long-term studies.

**Keywords:** Aspartame, Artificial sweetener, Gut microbiota, *Firmicutes*, *Bacteroidetes*

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