



The effects of dairy on the gut microbiome and gastrointestinal health in gastrointestinal disease cohorts: a systematic review

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Dairy foods, including fermented dairy foods, are widely consumed providing a range of essential nutrients including protein, fat, and calcium⁽¹⁾. Fermented dairy foods contain additional compounds, most notably probiotics, increasing their potential to benefit gastrointestinal health⁽²⁾. This review aims to explore the effects of dairy consumption on the gut microbiome and gastrointestinal health in cohorts with common gastrointestinal diseases or symptoms.

A systematic literature search was performed using PubMed, Embase and Scopus. Population criteria were human participants with gastrointestinal disease or associated symptoms, or animal models of gastrointestinal disease. Gastrointestinal diseases were restricted to inflammatory bowel disease (IBD), irritable bowel syndrome (IBS), and functional gastrointestinal disorders (FGIDs). Interventions involving consumption of dairy foods, including both fermented and non-fermented foods, were included. Comparators accepted were alternative dairy foods (e.g., fermented vs non-fermented dairy), dairy restriction, non-dairy placebo or a healthy cohort. Outcomes accepted were changes in gut microbial characteristics, short-chain fatty acid (SCFA) concentrations or gastrointestinal health parameters (clinical or self-reported). The Cochrane risk-of bias tool and SYRCLE's risk of bias tool were used to assess risk of bias in human and animal studies, respectively^(3,4).

The search strategy yielded 2622 studies in total, 26 of which were included in the data synthesis. Most studies were excluded based on test foods, outcomes, or populations that were out of scope. Fifteen studies with 1550 human participants and 11 studies with 627 animal subjects were included. Pooling animal and human research, 24 studies assessed the effect of dairy consumption on gastrointestinal parameters, including bloating, defecation, and gastrointestinal disease status. Sixteen studies assessed the effects of dairy on gut microbial diversity, relative bacterial abundances, and SCFA concentrations. All test foods were in the form of fermented dairy, primarily including fermented milk, yogurt, and kefir. Six studies showed significant increases in gastrointestinal bacterial diversity. Significant increases in relative abundances of *Lactobacillus* and *Bifidobacterium* at the genus level, and several species within these genera were identified in 9 studies. Six studies showed significant increases in SCFA concentrations, notably butyrate, acetate, and propionate, whereas 2 studies reported decreases in SCFA concentrations. Self-reported gastrointestinal symptoms improved significantly across all human studies which analysed this (n = 14). Five animal studies demonstrated improvements in non-self-reported gastrointestinal health parameters, wherein significant colonic mucosal healing and reduced colonic damage was shown.

This review highlights a strong body of evidence showing dairy consumption, fermented dairy in particular, can improve gut microbial characteristics and gastrointestinal health parameters in IBD, IBS and FGID cohorts. Further research in human cohorts is needed to expand test foods and to capture non-self-reported gastrointestinal health measures. Increased fermented dairy consumption may be an accessible and practical dietary method of managing symptoms and ameliorating gut microbial dysbiosis associated with common gastrointestinal diseases.

References

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