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Summary

GOING DEEP: THE EFFECT OF ULTRA-PROCESSED FOODS ON THE SMALL INTESTINE, A PILOT STUDY ON ILEOSTOMY PATIENTS

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A crossover study in 11 ileostomy patients (9 stable IBD, 2 non-IBD) demonstrates that 10 days of high ultra-processed food consumption enriches potentially pro-inflammatory Enterobacterales species in the small intestine and increases mucosal immune-related and inflammatory pathway expression.

KEY POINTS

- Differential abundance analysis identified significant enrichment of Enterobacterales order species (Escherichia albertii, Klebsiella variicola, Enterobacter cloacae, Salmonella enterica, Citrobacter freundii) following the high-UPF period ($q<0.1$).
- Mucosal transcriptomic profiling revealed an increase in immune-related and inflammatory pathways after high-UPF consumption, with effects remaining significant after adjustment for cell composition using spatial transcriptomics data.
- Luminal and mucosal small intestine microbiome communities were distinct (Beta diversity, PERMANOVA $q=0.001$), both primarily composed of Bacillota (62-69%), Proteobacteria (20-22%), Actinomycetota (3-8%), and Bacteroidata (4-5%).
- No significant differences in macronutrient composition or fiber intake were observed between dietary periods, and no changes in systemic biomarkers (CRP, calprotectin) or intestinal barrier markers (FABP2, LBP) were detected.
- The study used a crossover design with alternating 10-day high-UPF or low-UPF diet periods, challenge meals representing the opposite diet, and sampling at multiple time points including 6 hours post-challenge.

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