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Summary

OPTIMIZING CONDITIONS FOR IN VITRO MODELLING OF THE HUMAN GUT MICROBIOME TO STUDY INTESTINAL HEALTH AND DISEASE

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Colorectal

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An in vitro fermentation model demonstrates that stool samples can be stored in GutAlive containers for up to two days without significant microbiome alterations, and feeding strategy significantly impacts microbiome diversity metrics.

KEY POINTS

- Stool samples stored in GutAlive containers for up to 48 hours showed no significant changes in microbial community structure, enabling practical sample handling for in vitro studies
- Three feeding strategies were tested in a mini bioreactor system over five days: no-feeding, semi-continuous feeding, and continuous feeding with retention time comparable to human colon transit time
- Alpha diversity declined significantly throughout the experiment regardless of storage duration, with no-feeding strategy showing a tendency toward higher microbiome richness over time
- The five genera most considerably diminished during culture were Eubacterium eligens group, Eubacterium hallii group, Roseburia, Akkermansia, and Anaerostipes
- Feeding strategy significantly affected microbiome structure, with the no-feeding approach showing the least beta diversity changes over time

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