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Research interest  
■ The application of probiotics for  
maintaining health

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## *Impact of Bifidobacteria infantis 35624 on fecal flora from healthy and IBS subjects in a chemostat model*

**Background & Aim:** Clinical benefits in irritable bowel syndrome (IBS) and impact on fecal flora by the novel probiotic strain *Bifidobacterium infantis* 35624 have previously been reported. These studies investigated this probiotic impact on fecal flora derived from healthy (n=5) and IBS (n=5) subjects in a chemostat model.

**Methods:** Fecal samples were homogenized into slurries and filtered through cheesecloth to eliminate large particulates, then inoculated into a Braun Model M2 fermentor operated as a chemostat. Chemostat conditions were anaerobic via a continuous flow of N<sub>2</sub> (20 psi), pH stated to 7.0, impeller rate 50 rpm, 37°C and nutrient feed of 60ml/hr. Baseline (4 consecutive days) was followed by additions of *B. infantis* 35624 (10<sup>10</sup> CFU/day) for 4 consecutive days. Chemostat samples were evaluated for bacterial content using selective media for total anaerobes, Bifidobacterium, Fusobacterium, Clostridia, enteric pathogens and Bacteroides. Random bacterial colonies from selective media were further classified by 500 base pair sequence analysis of the 16s rRNA gene. Quantitative analysis of short-chain volatile fatty acids was conducted and changes in the chemical composition of the growth medium studied using NMR spectroscopy. Multivariate analysis was used to extract spectra of components whose concentrations changed during baseline and treatment phase.

**Results:** *B. infantis* 35624 reduced enteric pathogens from healthy subjects and black pigmented Bacteroides populations from IBS subjects, but had little to no effect on butyrate formation from either type of flora. *B. infantis* 35624 increased acetic acid production and reduced propionic formation in healthy flora; while it stimulated both acetic and propionic formation in IBS flora. NMR analysis found metabolites produced in higher concentrations in healthy versus IBS flora, with probiotic addition resulted in an increase production of these metabolites in IBS flora to levels similar to healthy flora. Probiotic addition also reduced the levels of metabolites elevated in IBS flora to levels comparable to the healthy flora.

**Conclusions:** In the chemostat model compositional differences in flora derived from healthy versus IBS subjects were noted. Overall *B. infantis* 35624 addition resulted in a change in the IBS profile (flora and metabolites) to mimic the healthy condition. These shifts provide a possible explanation for the observed clinical benefits associated with this novel probiotic.