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Prebiotic intake in habitual diet is not associated with luminal bifidobacteria concentration in irritable bowel syndrome

H. M. Staudacher^{1,2}, M. C. E. Lomer^{2,3}, J. L. Anderson¹, J. G. Barrett⁴, J. S. Muir⁴,
P. M. Irving^{1,3} and K. Whelan¹

¹Diabetes and Nutritional Sciences Division, King's College London, London, SE1 9NH, ²Departments of Nutrition and Dietetics, and ³Gastroenterology and ⁴Guy's and St Thomas' NHS Foundation Trust, London SE1 7EH, Central Clinical School, Monash University, Melbourne 3004 Australia

Prebiotic carbohydrates are widespread throughout the food supply, mostly in the form of inulin-type fructans (ITF) in grains and vegetables, and galacto-oligosaccharides (GOS) in pulses. Supplementation with ITF or GOS induces rapid marked bifidogenesis⁽¹⁾, however the relationship between habitual prebiotic intake and luminal colonic bifidobacteria is unknown. This might be especially important in those with dysbiosis, including the reduced luminal bifidobacteria seen in irritable bowel syndrome (IBS). It was hypothesised that habitual prebiotic intake would be positively correlated with luminal bifidobacteria concentration. The aim of this study was to investigate the relationship between 7-day habitual dietary prebiotic intake and the luminal microbiota in IBS.

Thirty-five people aged 18–65 years with irritable bowel syndrome (IBS) reporting bloating or diarrhoea were recruited. Participants refrained from taking probiotics, supplemental prebiotics or antibiotics in the previous 4 weeks. Intakes of ITF and GOS were quantified using a 7-day semi-quantitative food diary using published food composition tables and Foodworks (Xyris software). One day after completing the food diary, a fresh stool sample was collected and analysed for the major bacterial groups using fluorescent *in situ* hybridisation. Data was analysed using Pearson's correlation and ANOVA.

Mean \pm SD intakes of ITF and GOS were 2.9 \pm 1.7 g/d and 1.4 \pm 1.3 g/d, respectively. There was no significant correlation between habitual intake of ITF or GOS with bifidobacteria concentration, concentration of other bacterial groups analysed or total bacteria concentration. There were no differences in bifidobacteria concentration between those with low, medium or high tertiles of ITF or GOS intake. However, those in the lowest tertile of ITF intake (0.8–1.9 g/d) had lower concentration of *Bacteroides-Prevotella* than those with medium intake (2.0–2.6 g/d) (8.4 vs. 9.0 log₁₀ cells/g faeces, *P*=0.03).

Habitual dietary prebiotic intake is not associated with luminal bifidobacteria concentration in IBS. The bifidogenic effect of prebiotics might be specific to supplementation with greater doses (e.g. 5–10 g/d) but not at lower levels in the background diet observed here. The finding that low ITF intake is associated with lower concentration of *Bacteroides-Prevotella* is in line with previous work demonstrating the positive association between a high carbohydrate diet and this group⁽²⁾. Research that investigates whether the dysbiosis occurring in IBS can be adjusted through dietary means, rather than supplementation, is required.

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2. Fava F, Gitau R, Griffin BA *et al.* (2012) *Int J Obesity* **37**, 216–23.