Saccharomyces boulardii *Bifidobacterium lactis* HN019 *Lactobacillus plantarum* LP01 *Bifidobacterium breve* BR03 *Bifidobacterium animalis subsp. lactis* BS01

For restoring gut and intestinal flora

This table is a summary of the key research showing efficacy of these five probiotic strains in supporting gut flora during antibiotic use, restoring beneficial intestinal flora and supporting immune function and bowl regularity.

Publication	Study Design	Participants	Intervention	Outcomes	Clinical Relevance
Swidsinski, A, Loening–Baucke, V, Verstraelen, H, Osowska, S & Doerffel, Y 2008, 'Biostructure of Fecal Microbiota in Healthy Subjects and Patients With Chronic Idiopathic Diarrhea', *Gastroenerology,* Vol. 135, No. 2, pp.568–579.	Controlled clinical study.	20 patients with idiopathic diarrhoea, 25-72 years. 20 healthy controls, 18-60 years.	*Saccharomyces boulardii* 500mg, daily for 3 weeks.	Faecal microbiota testing was conducted weekly starting from 3 weeks prior to, during and after *Saccharomyces boulardii* supplementation. 9 samples were studied. Participants with idiopathic diarrhea reported symptom improvement in 70% of cases. The mean number of stools decreased significantly beginning in the first week of treatment. *Saccharomyces boulardii* significantly decreased mucus layer thickness (p=0.002) and presence of mucus striae in participants with idiopathic diarrhea. Decreased habitual bacteria concentrations and increased concentrations of mucotrop and occasional bacteria were found in those with idiopathic diarrhea compared to the control group. *Saccharomyces boulardii* significantly increased habitual bacteria concentrations and improved all other parameters except for some occasional bacterial groups. Fecal microbiotia in the healthy controls was unaffected by *Saccharomyces boulardii* supplementation.	**Gut Microbiota Restoration Efficacy Study** *Saccharomyces boulardii* significantly improved the fecal biostructure in participants with idiopathic diarrhea as well as improved symptoms in a majority. The control group was unaffected by supplementation. The results indicate that *Saccharomyces boulardii* may be of benefit to those with gut dysbiosis and idiopathic diarrhea and can help restore beneficial intestinal flora. *Saccharomyces boulardii* was well tolerated.
Kabbani, T.A, Pallav, K, Dowd, S.E, Villafuerte-Galvez, J, Vanga, R.R, Castillo, N.E, Hansen, J, Dennis, M, Leffler, D.A & Kelly, C.P 2017, 'Prospective randomized controlled study on the effects of *Saccharomyces boulardii* CNCM I-745 and amoxicillin-clavulanate or the combination on the gut microbiota of healthy volunteers', *Gut Microbes,* Vol. 8, No. 1, pp.17–32.	Single centre, open-label, randomised, placebo-controlled study.	53 healthy adults, 18-51 years.	4 groups: *Saccharomyces boulardii* (SB) 1000mg, daily for 14 days or Amoxicillin-Clavulanate (AC) for 7 days or SB and AC combined (duration as above) or Control group (no treatment).	Faecal microbiota composition was examined at baseline (Day 0), during treatment (Day 3,7,10 and 13) and at follow up (Day 21). Significantly reduced bacterial diversity was found in both antibiotic treated groups. Significant microbiota changes were found in the antibiotic only group with reduced prevalence of the genus Roseburia and increased amounts of Escherichia, Parabacteroides and Enterobacter. Participants taking *Saccharomyces boulardii* with the antibiotic had less pronounced microbiota shifts including decreased overgrowth of Escherichia. The Gastrointestinal Symptom Rating Scale (GSRS) total score at Day 7 was significantly higher in the antibiotic group (AC) compared to the SB+AC group (p=0.0262). The diarrhoea sub-score was significantly increased in the AC group compared to baseline (p=0.001) and compared to the SB+AC group (p=0.01). A significant difference was still found at Day 14, 7 days after antibiotic treatment had ceased. Overgrowth of Escherichia corresponded with antibiotic-associated diarrhea (p<0.001). The placebo group and participants treated with *Saccharomyces boulardii* alone had a stable microbiotia throughout the study.	**Gut Microbiota and Antibiotics Efficacy Study** *Saccharomyces boulardii* supplementation mitigated some antibiotic induced microbiota changes, which corresponded with significantly reduced antibiotic-associated diarrhea. The results indicate that *Saccharomyces boulardii* may help prevent antibiotic induced dysbiosis, and related symptoms, when administered concurrently and following antibiotic treatment. *Saccharomyces boulardii* was well tolerated.

Saccharomyces boulardii , *Bifidobacterium lactis* HN019, *Lactobacillus plantarum* LP01, *Bifidobacterium breve* BR03 and *Bifidobacterium animalis subsp. lactis* BS01

Publication	Study Design	Participants	Intervention	Outcomes	Clinical Relevance
Szajewska, H & Kołodziej, M 2015, 'Systematic review with meta-analysis: *Saccharomyces boulardii* in the prevention of antibiotic-associated diarrhoea', *Alimentary Pharmacology & Therapeutics,* Vol. 42, No. 7, pp.793–801.	Systematic review and meta-analysis.	Adults and children.	*Saccharomyces boulardii* 250-1000mg.	Participants treated with *Saccharomyces boulardii,* combined with antibiotics, had a reduced risk of antibiotic-associated diarrhoea from 18.7% to 8.5% (risk ratio, RR: 0.47; 95% CI: 0.38-0.57, number needed to treat, NNT: 10; 95% CI: 9-13) compared with placebo or no treatment. *Saccharomyces boulardii* supplementation reduced the risk from 20.9% to 8.8% in children (6 randomised controlled trials, n=1653, RR: 0.43, 95% CI: 0.3-0.6) and from 17.4% to 8.2% in adults (15 randomised controlled trials, n=3114, RR: 0.49, 95% CI: 0.38-0.63).	**Antibiotic-associated Diarrhoea Prevention Studies** *Saccharomyces boulardii* supplementation concomitantly administered with antibiotics reduced the risk of antibiotic-associated diarrhea in adults and children compared with placebo or no intervention. *Saccharomyces boulardii* was well tolerated.
Waller, P.A, Gopal, P.K, Leyer, G.J, Ouwehand, A.C, Reifer, C, Stewart, M.E, & Miller, L.E 2011, 'Dose-response effect of *Bifidobacterium lactis* HN019 on whole gut transit time and functional gastrointestinal symptoms in adults', *Scandinavian Journal of Gastroenterology*, Vol. 46, No. 9, pp.1057–1064.	Randomised, triple-blind, placebo-controlled, parallel group study.	100 healthy adults, 25-65 years, 1-3 bowel movements/ week.	*Bifidobacterium lactis* HN019 1.8 billion CFU, 17.2 billion CFU or placebo, daily for 14 days.	Whole gut transit time (WGTT) was assessed by abdominal X-ray at baseline (Day 0) and completion of the study (Day 14). Participants supplemented with *Bifidobacterium lactis* HN019 had a 33% reduced mean WGTT for the 17.2 billion CFU dose (p<0.001) and 25% for the 1.8 billion CFU dose (p=0.01) by the completion of the study. WGTT was significantly shorter in the treatment groups compared to placebo. Most gastrointestinal symptoms decreased in frequency in the *Bifidobacterium lactis* HN019 treated groups. Changes in constipation (p<0.001), irregular bowel movements (p<0.01) and flatulence (p<0.05) showed approximately two-fold decrease in symptom frequency over the course of the study.	**Gastrointestinal System Function Efficacy Study** *Bifidobacterium lactis* HN019 supplementation significantly decreased WGTT and frequency of gastrointestinal symptoms including constipation, irregular bowel movements and flatulence after 14 days. The results indicate that *Bifidobacterium lactis* HN019 could benefit individuals with low bowel frequency and associated symptoms. *Bifidobacterium lactis* HN019 was well tolerated.
Del Piano, M, Carmagnola, S, Anderloni, A, Andorno, S, Ballarè, M, Balzarini, M, Montino, F, Orsello, M, Pagliarulo, M, Sartori, M, Tari, R, Sforza, F & Capurso, L 2010, 'The Use of Probiotics in Healthy Volunteers With Evacuation Disorders and Hard Stools', *Journal of Clinical Gastroenterology,* Vol. 44, S30–S34.	Randomised, double-blind, placebo-controlled study.	300 healthy adults, 24-71 years, with evacuation disorders and hard stools.	Group A: Placebo Group B: *Lactobacillus plantarum* LP01 and *Bifidobacterium breve* BR03 (2.5 billion CFU of each strain) Group C: *Bifidobacterium animalis subsp. lactis* BS01 (5 billion CFU) Daily for 30 days.	Case reports detailing gastrointestinal symptoms were assessed for the week prior to Day 1 (baseline), Day 15 and Day 30 of the study. Participants taking *Lactobacillus plantarum* LP01 + *Bifidobacterium breve* BR03 and *Bifidobacterium animalis subsp. lactis* BS01 had a significant increase in the number of weekly bowel movements by Day 15 and the end of the study (Day 30) compared to baseline (p<0.001). *Lactobacillus plantarum* LP01 + *Bifidobacterium breve* BR03 improved faeces consistency by Day 15 (p=0.003) and Day 30 (p=0.001). Ease of expulsion was also significant by Day 15 (p=0.002) and the end of the study (p<0.001). Sensation of complete emptying was significant after 30 days of probiotic treatment compared to placebo (p<0.001). Discomfort associated with bowel movements was significantly decreased by Day 15 (p=0.007) and Day 30 (p<0.001) compared with placebo. A significant reduction in abdominal bloating was found after 2 weeks of probiotic treatment in both active groups (p<0.001).	**Gastrointestinal System Function Efficacy Study** *Lactobacillus plantarum* LP01 + *Bifidobacterium breve* BR03 and *Bifidobacterium animalis subsp. lactis* BS01 increased weekly bowel movements and gastrointestinal symptoms after 2 weeks of supplementation. These probiotic strains may be of particular use to those with low defecation frequency and associated symptoms. *Lactobacillus plantarum* LP01, *Bifidobacterium breve* BR03 and *Bifidobacterium animalis subsp. lactis* BS01 were well tolerated.
West, N.P, Horn, P.L, Pyne, D.B, Gebski, V.J, Lahtinen, S.J, Fricker, P.A & Cripps, A.W 2014, 'Probiotic supplementation for respiratory and gastrointestinal illness symptoms in healthy physically active individuals', *Clinical Nutrition,* Vol. 33, No. 4, pp.581-587.	Randomised, double-blind, placebo-controlled study.	465 healthy adults, 18-60 years.	*Bifidobacterium animalis subsp. lactis* BI-04 2 billion CFU or *Lactobacillus acidophilus* NCFM + *Bifidobacterium animalis subsp. lactis* Bi-07 or placebo, for 150 days.	Questionnaires were completed weekly to assess upper respiratory illness (URTI) or gastrointestinal illness. *Bifidobacterium animalis subsp. lactis* BI-04 supplementation reduced the URTI risk by 27% compared to placebo (p=0.002). The median time to first URTI was 3.2 months compared to 2.5 months in the placebo group.	**Immune System Function Efficacy Study** *Bifidobacterium animalis subsp. lactis* BI-04 supplementation reduced the risk of URTI in active, healthy participants. *Bifidobacterium animalis subsp. lactis* BI-04 was well tolerated.

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