

Restore SAP

Science-based probiotics for gastrointestinal health

Probiotics have long been studied for their numerous health benefits. Scientific research is now at a point where we can now gather a host of clinical studies and draw stronger conclusions regarding the impact of probiotics on specific health conditions. Prominent among these conditions are gastrointestinal disorders, where probiotics play a major role in restoring gut microbial flora with beneficial bacteria, and improving symptoms of diarrhea, irritable bowel syndrome and antibiotic associated diarrhea. Multi strain probiotics with various strains of *Lactobacillus* and *Bifidobacterium* are known to be more effective than single strain formulations. Additionally, supplementation with the beneficial fungus *Saccharomyces boulardii* provides protection against pathogens such as *Clostridium difficile*. Probiotic supplementation, via the gut-brain axis also can modulate mental health disorders such as depression and anxiety. Probiotics also help improve cognition in patients with Alzheimer's and patients suffering from cognitive impairment. Strong evidence from a meta-analysis study has shown that probiotics can boost the body's natural immunity and provide support to improve the recovery rate from infections. Probiotic administration to type 2 diabetes patients, non-alcoholic fatty liver disease patients and obese people has shown significant improvement in metabolic parameters, showing the therapeutic potential of probiotics in management of lifestyle disorders.

Restore SAP is a multi-strain probiotic formulation with *S. boulardii* that helps maintain a healthy gut flora, reduces risk of antibiotic-associated diarrhoea, alleviates parasite infections and supports gastrointestinal health.

ACTIVE INGREDIENTS

Each enteric vegetable capsule contains:

<i>Saccharomyces boulardii</i> CNCM I-1079	5 billion CFU
<i>Lactobacillus rhamnosus</i> R0011	2.5 billion CFU
<i>Bifidobacterium bifidum</i> R0071	1.25 billion CFU
<i>Bifidobacterium breve</i> R0070	1.25 billion CFU
<i>Bifidobacterium infantis</i> R0033	0.5 billion CFU

OTHER INGREDIENTS: Inulin, ascorbic acid, magnesium stearate, arabinogalactan, potato starch, saccharose, maltodextrin, yeast extract (peptone), and hypromellose (carbohydrate gum), hypromellose acetate succinate and purified water.

Contains no: Gluten, wheat, eggs, citrus, preservatives, artificial flavour or colour.

This product is non-GMO and vegetarian friendly

Do not use if seal is broken. Keep out of reach of children

DIRECTIONS FOR USE

Suggested use: Adults: Take 1-2 capsules daily or as directed by your healthcare practitioner.

INDICATIONS

Restore SAP helps:

- Contribute to a natural healthy gut flora
- Reduce the risk of antibiotic-associated diarrhoea
- Prevent risk of parasitic infections and improve parasite clearance when used as an adjuvant
- Support gastrointestinal health

CONTRAINDICATIONS

This product has come into contact with milk and soy. Do not use this product if you have a milk or soy allergy. Do not use if you have an immune-compromised condition (e.g. AIDS, lymphoma, patients undergoing long-term corticosteroid treatment).

CAUTIONS AND WARNINGS

If you have fever, vomiting, bloody diarrhoea or severe abdominal pain, consult a healthcare practitioner prior to use. Discontinue use and consult a healthcare practitioner if symptoms of digestive upset (e.g. diarrhoea) occur, worsen, or persist beyond 3 days.

PURITY, CLEANLINESS & STABILITY

All ingredients listed for each **Restore SAP** have been tested by an ISO 17025 accredited third-party laboratory for identity, potency and purity.

Scientific Advisory Panel (SAP):
adding nutraceutical research
to achieve optimum health



351, Rue Joseph-Carrier, Vaudreuil-Dorion, Quebec, J7V 5V5
T 1 866 510 3123 • F 1 866 510 3130 • nfh.ca

Probiotics are beneficial symbiotic microorganisms have been extensively studied for their ability to foster our health by modulate various physiological mechanisms, improve gastrointestinal disorders as well as diseases occurring outside of the GI tract. [1] The two main groups of probiotics found in the intestinal tract are *Lactobacillus* and *Bifidobacterium*, which are also the most widely studied. [1] Various meta-analyses have confirmed the use of probiotics to treat gastrointestinal disorders such as diarrhea, including antibiotic associated diarrhea and irritable bowel syndrome. [2,3,4] A similar meta-analysis of non-gastrointestinal conditions with probiotic treatment shows promising therapeutic results for upper respiratory tract illness [5], depression, and bacterial vaginosis among other disorders. [5,6,7]. In addition to strains from the two most prominent group of bacteria, ie. *Lactobacillus* and *Bifidobacterium*, the naturally occurring yeast *Saccharomyces boulardii* is also frequently administered as a part of probiotic treatment, for its therapeutic potential against *Clostridium difficile* infections. [1]

PROBIOTICS AND GASTROINTESTINAL DISORDERS

The primary use of probiotics has been to treat gastrointestinal conditions and improve gut integrity and function. Several trials have been conducted to study the effect of probiotics on different gastrointestinal disorders. Meta-analysis of 63 randomized controlled trials with a total of 8014 participants showed that 15 studies with a higher probiotic dose ($> 10^{10}$ CFU/day) and 26 studies with a lower dose ($\leq 10^{10}$ CFU/day) showed beneficial effects in reducing duration and frequency of diarrhea, while 22 studies with unclear dosage information showed similar therapeutic results. [2] This evidence holds especially true in the case of antibiotic associated diarrhea, where a number of systematic reviews and meta-analyses have shown that probiotics are effective in prevention of antibiotic associated diarrhea in children. The study by Szajewska et al 2016 provided strain specific recommendations, with special emphasis on *Lactobacillus rhamnosus* and *S. boulardii* for the treatment of antibiotic associated diarrhea, and the use of *S. boulardii* for prevention of *Clostridium difficile* associated diarrhea. [3] A separate meta-analysis conducted with 63 randomized controlled trials with 1181 participants showed significant reduction of antibiotic associated diarrhea with administration of probiotics. [8] A meta-analysis of 14 studies with 865 participants showed that probiotics may help with symptoms of ulcerative colitis when compared with a placebo and also suggested that further carefully designed studies could substantiate this evidence. [9]

PROBIOTICS AND MENTAL HEALTH

The bidirectional communication between the gut microbiome and nervous system is well known. Probiotics have even been termed 'psychobiotics' due to their ability to modulate psychiatric disorders. [10] A meta-analysis of 23 studies showed a significant reduction in symptoms of depression with probiotic administration, the most successful being multi-strain probiotic supplementation. [10] These results have been previously confirmed with a meta-analysis that analyzed 12 clinical trials and showed a significant reduction in depression scores with probiotic administration. [6] Although meta-analyses observing the effects of probiotics on anxiety call for the need for stronger clinical evidence, randomized clinical trials conducted so far with multi-strain probiotics show promising results. In a randomized, double-blind, placebo controlled trial conducted with 70 petrochemical workers, administration of 1×10^{10} CFU of probiotic yoghurt coupled with a multi-strain probiotic capsule for 6 weeks significantly improved general health scores as well as depression anxiety and stress scores. [11] Probiotic supplementation can also help improve cognitive function and modulate markers of inflammation. In a meta-analysis conducted with 5 studies with a total of 297 participants with Alzheimer's disease or mild cognitive impairment, supplementation with probiotics significantly improved cognitive function, coupled with reduction in malondialdehyde and high-sensitivity C-reactive protein, indicating that probiotics may exert their influence on cognitive function by reducing levels of oxidative and inflammatory markers. [12]

PROBIOTICS AND IMMUNITY

Due to the ability of probiotics to modify gut microbial flora, and their effect on oxidative and inflammatory markers, their beneficial effects extend to the immune system as well. A meta-analysis conducted with 12 clinical trials with 3720 participants showed that probiotic supplementation was associated with lower incidence of acute upper respiratory tract infections, duration of infection and antibiotic use. [5] Another meta-analysis reported similar findings, where analysis of 20 randomized controlled trials conducted with healthy adults and children showed that probiotic supplementation was associated with lesser duration and intensity of illness and reduced days off work. [13] Analysis of 9 clinical trials conducted with a total of 623 adults showed that probiotics and prebiotics improved vaccine immunogenicity by modulating seroprotection and seroconversion rates, indicating the supportive nature of probiotics in boosting immunity in case of vaccinations. [14]

PROBIOTICS AND METABOLIC DISORDERS

The ability of probiotics to influence metabolic and hormonal parameters is well known. Probiotic supplementation can have a significant impact on quality of life for individuals suffering from lifestyle disorders. A meta-analysis of 105 clinical trials showed that probiotic supplementation significantly improved body weight, body mass index, body fat, waist circumference and visceral adipose tissue mass. [15] Analysis of trials with type 2 diabetes patients showed probiotic supplementation decreased levels of fasting glucose, glycated hemoglobin, insulin and improved insulin resistance. Additionally, probiotics appeared to reduce aspartate aminotransferases and alanine levels in patients with fatty

liver. These results were observed with multi strain products containing *Lactobacillus* and *Bifidobacterium* strains. [15]

SACCHAROMYCES BOULARDII IN ACUTE AND CHRONIC DISEASES

The multiple prophylactic and therapeutic effects of *S. boulardii* in inflammatory gastrointestinal diseases underline its efficacy in enteric diseases. [16] *S. boulardii* supplementation has been studied in antibiotic-associated diarrhea, *Clostridium difficile* infection, acute diarrhea, persistent diarrhea, enteral nutrition-related diarrhea, traveler's diarrhea, *Helicobacter pylori* infection. [16] *S. boulardii* supplementation has also been studied in chronic diseases such as Crohn's disease, ulcerative colitis, irritable bowel syndrome, parasitic infections (amebic colitis, giardiasis, *Blastocystis hominis* and human immunodeficiency virus (HIV)-related diarrhea. [16]

In a study with patients suffering from acute amebic colitis, co-administration of *S. boulardii* with conventional treatment significantly decreased the duration of symptoms and cyst carriage after 4 weeks. [17] In another prospective randomized clinical study in amebic colitis patients, addition of *S. boulardii* to metronidazole improved clearance of cysts and reduced the duration of diarrhea, fever and abdominal pain. [18]

Disappearance of Giardia cysts 2 weeks after start of the treatment was reported in a study with an adjuvant therapy of *S. boulardii* in combination with metronidazole in patients suffering from giardiasis in contrast to 17.1% of patients treated with 10 days metronidazole as monotherapy whose stool samples had *Giardia lamblia* cysts persisting. [19]. These results are encouraging despite being smaller studies, and larger studies can help establish the therapeutic benefits of *S. boulardii* in parasitic infections.

The use of probiotics has far reaching effects, and new benefits of probiotic supplementation are being discovered every day. A recent meta-analysis of 25 studies showed that multi-strain probiotic supplementation lowered the incidence of occurrence of atopic dermatitis in children, especially when pregnant mothers were administered probiotics. [20] Further studies will help in strengthening the evidence on the plethora of benefits of probiotics for different disorders.

REFERENCES

- Islam S.U. "Clinical Uses of Probiotics." *Medicine (Baltimore)*. No. 5 (2016 Feb):95-e2658.
- Allen S.J., et al. "Probiotics for treating acute infectious diarrhoea." *Cochrane Database Syst Rev*. No. 11 (2010 Nov 10): 2010-CD003048.
- Szajewska H., et al. "Probiotics for the Prevention of Antibiotic-Associated Diarrhea in Children." *J Pediatr Gastroenterol Nutr*. Vol. 506, No. 3 (2016 Mar): 62-495.
- Didari T., et al. "Effectiveness of probiotics in irritable bowel syndrome: Updated systematic review with meta-analysis." *World J Gastroenterol*. Vol. 84, No. 10 (2015 Mar 14): 21-3072.
- Hao Q., et al. "Probiotics for preventing acute upper respiratory tract infections." *Cochrane Database Syst Rev*. (2015 Feb 3): 2-CD006895.
- Huang R., et al. "Effect of Probiotics on Depression: A Systematic Review and Meta-Analysis of Randomized Controlled Trials." *Nutrients*. No. 8 (2016 Aug 6): 8-483.
- Wang Z., et al. "Probiotics for the Treatment of Bacterial Vaginosis: A Meta-Analysis." *Int J Environ Res Public Health*. No. 20 (2019 Oct 12): 16-3859.
- Hempel S., et al. "Probiotics for the prevention and treatment of antibiotic-associated diarrhea: a systematic review and meta-analysis." *JAMA*. Vol. 69, No. 18 (2012 May 9): 307-1959.
- Kaur L., et al. "Probiotics for induction of remission in ulcerative colitis." *Cochrane Database Syst Rev*. No. 3 (2020 Mar 4): 3-CD005573.
- Zagorska A., et al. "From probiotics to psychobiotics - the gut-brain axis in psychiatric disorders." *Benef Microbes*. Vol. 732, No. 8 (2020 Dec 2): 11-717.
- Mohammadi A.A., et al. "The effects of probiotics on mental health and hypothalamic-pituitary-adrenal axis: A randomized, double-blind, placebo-controlled trial in petrochemical workers." *Nutr Neurosci*. Vol. 395, No. 9 (2016 Nov): 19-387.
- Den H., et al. "Efficacy of probiotics on cognition, and biomarkers of inflammation and oxidative stress in adults with Alzheimer's disease or mild cognitive impairment - a meta-analysis of randomized controlled trials." *Aging (Albany NY)*. Vol. 4039, No. 4 (2020 Feb 15): 12-4010.
- King S., et al. "Effectiveness of probiotics on the duration of illness in healthy children and adults who develop common acute respiratory infectious conditions: a systematic review and meta-analysis." *Br J Nutr*. Vol. 54, No. 1 (2014 Jul 14): 112-41.
- Lei W.T., et al. "Effect of Probiotics and Prebiotics on Immune Response to Influenza Vaccination in Adults: A Systematic Review and Meta-Analysis of Randomized Controlled Trials." *Nutrients*. No. 11 (2017 Oct 27): 9-1175.
- Koutnikova H., et al. "Impact of bacterial probiotics on obesity, diabetes and non-alcoholic fatty liver disease related variables: a systematic review and meta-analysis of randomised controlled trials." *BMJ Open*. No. 3 (2019 Mar 30): e017995.
- Kelesidis, T., & Pothoulakis, C. "Efficacy and safety of the probiotic *Saccharomyces boulardii* for the prevention and therapy of gastrointestinal disorders." *Therapeutic advances in gastroenterology*. Vol. 125, No. 2 (2012): 5-111.
- Mansour-Ghaneai F., et al. "Efficacy of *Saccharomyces boulardii* with antibiotics in acute amoebiasis." *World J Gastroenterol*. Vol. 1833 (2003) 9-1832 [PMC free article] [PubMed] [Google Scholar].
- Dinleyici E.C., et al. "Clinical efficacy of *Saccharomyces boulardii* and metronidazole compared with metronidazole alone in children with acute bloody diarrhea caused by amebiasis: a prospective, randomized, open label study." *Am J Trop Med Hyg*. Vol. 80 (2009): 953-955 [PubMed] [Google Scholar]
- Besirbellioglu B.A., et al. "Saccharomyces boulardii and infection due to *Giardia lamblia*." *Scand J Infect Dis*. Vol. 38 (2006): 479-481 [PubMed] [Google Scholar]
- Jiang W., et al. "The Role of Probiotics in the Prevention and Treatment of Atopic Dermatitis in Children: An Updated Systematic Review and Meta-Analysis of Randomized Controlled Trials." *Paediatr Drugs*. Vol. 549, No. 5 (2020 Oct): 22-535.