

Probiotics and Psychobiotics for Depression and Mental Health



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Summary: For millennia, humans have been eating fermented foods. Modern research confirms that fermented foods are good for us, because they contain healthy bacteria known as probiotics.

What are Probiotics?

Probiotics are the live bacteria found in fermented foods (such as yogurt and sauerkraut), which appear to be beneficial for health. Because probiotics are healthy for the brain, some experts also refer to them as “psychobiotics”.

How Do Probiotics Help?

The human gastrointestinal tract (GI tract) is a very complex ecosystem, with more than 1,000 bacterial species. Probiotics help in many ways:

- They form a part of the healthy community of microbes (i.e. healthy microbiome) in our body;
- They make it harder for unhealthy bacteria to survive in our body;
- Reduce the production of inflammatory chemicals, such as cytokines;
- They help to break down compounds that we cannot digest;
- Defend our GI tract against pathogenic (i.e. disease-causing) bacteria;
- Stimulate our immune system;
- They make “post-biotics”, which are the healthy leftover products after your body digests prebiotics and probiotics such as
 - Vitamins B and K, amino acids,
 - Antimicrobial peptides and acids (which impair harmful bacteria),
 - Short-chain fatty acids (which help healthy bacteria to thrive).

Recommendations for Probiotics

Eat probiotic foods for at least several weeks, such as:

- Yogurt or kefir (made from the fermentation of milk)
- Kombucha (made from the fermentation of tea)
- Tempeh or miso (made from the fermentation of soy products)
- Kimchi or sauerkraut (made from the fermentation of cabbage)

Note

- Fermented foods with live culture is best.
- Try to purchase fermented foods from the refrigerated section of the grocery store, as this will most likely mean that there is live culture. You can check the label to ensure it says “live culture” or “live bacteria” on the ingredients. On the other hand, food sold on a shelf or in a can (e.g. a can of sauerkraut) will probably not have live culture.
- Probiotics are best when taken
 - In the morning (when our stomach acid is at the lowest level),
 - With or after food (because this further protects the healthy bacteria from being killed by stomach acid).

Ensure you are eating prebiotics too

Prebiotics are the compounds that act as food for probiotics and thus help them thrive such as

Foods with fermentable fibre	Resistant starches	Polyphenols
<ul style="list-style-type: none"> • Garlic • Onions • Berries • Jerusalem artichokes • Mushrooms • Rye • Barley 	<ul style="list-style-type: none"> • Legumes • Seeds • Grains • Cooked potatoes • Green bananas • Plantain • Corn • 	<ul style="list-style-type: none"> • Onion • Apple • Tea • Cocoa • Red wine • Red fruit • Soybeans

How Long to See Improvement?

In a study where people took probiotic supplements *Lactobacillus acidophilus* and *Bifidobacteria langum*, health improvements were seen as early as thirty days (Messaoudi, 2011).

Side Effects of Probiotics

Most people can ingest probiotics without any significant problems -- after all, humans have been consuming them for millennia.

- Side effects are possible, however, and some people report a temporary increase in gas, bloating or diarrhea as the probiotic changes the flora in the gut. However, these effects usually improve within days or weeks of starting probiotics.

Are you wondering about probiotics in someone with a compromised immune system, severe medical illness or other medical issues?

- If so, it is best to speak with your healthcare provider for advice in your situation.

What about Probiotic Supplements?

On one hand, many scientific studies have used probiotic supplements. One can find probiotic supplements sold in grocery stores, pharmacies and health food stores.

On the other hand, many experts recommend probiotic foods rather than supplements. The reason is that addition

to the live bacteria, one is also ingesting the environment in which they thrive (such as prebiotics) (Rad, 2016).

References

- Allen, A., Hutch, W., Borre, Y. et al. Bifidobacterium longum 1714 as a translational psychobiotic: modulation of stress, electrophysiology and neurocognition in healthy volunteers. *Transl Psychiatry* 6, e939 (2016). <https://doi.org/10.1038/tp.2016.191>
- Ansari F, Pourjafar H, Tabrizi A, Homayouni A. The Effects of Probiotics and Prebiotics on Mental Disorders: A Review on Depression, Anxiety, Alzheimer, and Autism Spectrum Disorders. *Curr Pharm Biotechnol.* 2020;21(7):555-565. doi: 10.2174/1389201021666200107113812. PMID: 31914909. <https://pubmed.ncbi.nlm.nih.gov/31914909/>
- Dinan T, Stanton C, Cryan J: Psychobiotics: A Novel Class of Psychotropic, *Biological Psychiatry*, 2013 Nov 15, 74(10): 720-726. <https://doi.org/10.1016/j.biopsych.2013.05.001>
- Homayoni Rad A, Vaghef Mehrabany E, Alipoor B, Vaghef Mehrabany L. The Comparison of Food and Supplement as Probiotic Delivery Vehicles. *Crit Rev Food Sci Nutr.* 2016;56(6):896-909. doi: 10.1080/10408398.2012.733894. PMID: 25117939.
- Messaoudi M, Lalonde R, Violle N, et al. Assessment of psychotropic-like properties of a probiotic formulation (Lactobacillus helveticus R0052 and Bifidobacterium longum R0175) in rats and human subjects. *Br J Nutr.* 2011;105(5):755-764. doi:10.1017/S0007114510004319
- Nadeem I, Rahman MZ, Ad-Dab'bagh Y, Akhtar M. Effect of probiotic interventions on depressive symptoms: A narrative review evaluating systematic reviews. *Psychiatry Clin Neurosci.* 2019 Apr;73(4):154-162. doi: 10.1111/pcn.12804. Epub 2019 Jan 6. PMID: 30499231. <https://pubmed.ncbi.nlm.nih.gov/30499231/>
- Probiotics: What You Need to Know, National Center for Complementary and Integrative Health. Retrieved Sat, July 30, 2022 from <https://www.nccih.nih.gov/health/probiotics-what-you-need-to-know>
- Metchnikoff E: *Essais optimistes. The prolongation of life. Optimistic studies.* Translated and edited by P. Chalmers Mitchell. 1907, London: Heinemann
- Noonan S, Zaveri M, Macaninch E, et al Food & mood: a review of supplementary prebiotic and probiotic interventions in the treatment of anxiety and depression in adults. *BMJ Nutrition, Prevention & Health* 2020;3:doi: 10.1136/bmjnph-2019-000053 <https://nutrition.bmj.com/content/3/2/351>
- Wallace CJK, Milev R. The effects of probiotics on depressive symptoms in humans: a systematic review. *Ann Gen Psychiatry.* 2017 Feb 20;16:14. doi: 10.1186/s12991-017-0138-2. Erratum in: *Ann Gen Psychiatry.* 2017 Mar 7;16:18. PMID: 28239408; PMCID: PMC5319175.

Authors

Written by members of the eMentalHealth.ca Team and the professionals at the Children's Hospital of Eastern Ontario (CHEO) in Ontario, Canada. French translation by Mary Velez (uOttawa RN candidate, class of 2024).

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