Journal of Food & Nutritional Disorders

COMMENTARY

A SCITECHNOL JOURNAL

Effect of Probiotics on Gut Microbiota

John Smith*

Commentary

The term microbiome is defined as the overall amount of microbial genes harboured by the microbiota that is the microbes inhabiting the intestines of humans [1]. There are trillions of bacteria in the human stomach that interact with the host.

The gut microbiota has a number of beneficial qualities, including the fermentation of non-digestible substrates including dietary fibres and endogenous intestinal mucus, which supports the growth of microorganisms that create (Short Chain Fatty Acids) SCFAs like acetate, propionate, and butyrate, as well as gases [2,3]. Changes in the gut microbiota can occur within days of changing diet, according to studies; African Americans and rural Africans who switched diets for only two weeks revealed significant differences [4]. Another study evaluating dramatic transitions between plant and animal protein-based diets after only five found similar results days [5]. Healthy microbiota,on the other hand, are resistant to temporal changes caused by dietary treatments, indicating that homeostatic reactions restore the original community composition, as demonstrated recently in the case of bread [6].

Probiotics are live microorganisms that provide a health benefit to the host when given in sufficient doses [2]. Lactobacilli, Streptococci, and Bifidobacteria are currently the most common probiotic bacteria utilised in human nutrition, supplements, and animal feed [7].

Probiotics boost human health by altering the resident microbiota, either by temporarily replacing a missing feature of the microbiota, augmenting the endogenous population, or energising (part of) the resident microbiota [7]. Certain probiotic strains which secrete antibiotic-like factors help to prevent the growth of potential competitors. By effectively using the niche and accessible sources of energy in the digestive system, probiotic microorganisms can inhibit the growth of foreign germs and reduce the availability of substrate for pathogens. The use of antibiotics is known to have long-term effects on the intestinal microbiota composition and thereby on health, thus probiotics are given in parallel with the antibiotics as certain studies that they lower the distortion of the gut microbiota [8-11].

The ability of probiotics to control the effect of the gut microbiota on the local immunological and inflammatory systems, down-regulating overstimulated inflammatory and/or immune responses either directly or indirectly is another possible benefit of probiotics [13,14]. A few probiotics can affect the gut microbiota's enzymatic activities, such as nitrogen digestion as measured by urinary p-cresol concentrations, glucosidases, bile salt hydrolases, and azoreductase [14].

***Corresponding author:** John Smith, Department of Food and Nutritional Disorders, University of New York, USA, E-mail: John_smith1987@gmail.com

Received: June 04, 2021 **Accepted:** June 11, 2021 **Published:** June 24, 2021

The cross-talk between the intestinal microbiota (that is an integralpart of us) and host leads to life-long epigenetic programming. Along these lines, manipulating the microbiota, either by prebiotics, probiotics or fecal microbial transplantation, seems rational for the prevention and treatment of disease [7].

Probiotics have been proposed to restore the healthy composition and function of the gut microbiome as a result of their preventative and therapeutic effects. Human microbiome research, on the other hand, may lead to the discovery of new indigenous microbial species and the development of techniques to positively affect gut microbial ecosystems [15].

References

1. Morelli L, Callegari ML (2015) The effect of diet and probiotics on the human gut microbiome. In Metabolic syndrome and complications of pregnancy. Springer, Cham, 35-45.
2. Valdes AM, Walter J, Segal E, Spector TD (2018) Role of the gut microbiota in nutrition and health. BMJ, 361.
3. Kendall C, Emam A, Jenkins D (2006) Colonic health: fermentation and short. J Clin Gastroenterol 40: 235-243.
4. O'Keefe SJ, Li JV, Lahti L, Ou J, Carbonero F, et al. (2015) Fat, fibre and cancer risk in African Americans and rural Africans. Nat Commun 6: 1-4.
5. David LA, Maurice CF, Carmody RN, Gootengerg DB, Button et al. (2013) Diet rapidly and reproducibly alters the human gut microbiome. Nature 505: 7484.
6. Korem T, Zeevi D, Zmora N, Weissbrod O, Bar N, et al. (2017) Bread affects clinical parameters and induces gut microbiome associated personal glycemic responses. Cell Metab 25: 1243-1253.
7. Scott KP, Michel AJ, Midtvedt T, Van Hemert S (2015) Manipulating the gut microbiota to maintain health and treat disease. Microb Ecol Health Dis 26: 25877.
8. Greenwood C, Morrow AL, Lagomarcino AJ, Altaye M, Taft DH, et al. (2014) Early empiric antibiotic use in preterm infants is associated with lower bacterial diversity and higher relative abundance of Enterobacter. J Pediatr 165: 23-29.
9. Blaser M (2011) Stop the killing of beneficial bacteria. Nature 476: 393-394.
10. Koning CJ, Jonkers DM, Stobberingh EE, Mulder L, Rombouts FM, et al. (2008) The effect of a multispecies probiotic on the intestinal microbiota and bowel movements in healthy volunteers taking the antibiotic amoxycillin. Am J Gastroenterol 103: 178-189.
11. Engelbrektson A, Korzenik JR, Pittler A, Sanders ME, Klaenhammer TR, et al. (2009) Probiotics to minimize the disruption of faecal microbiota in healthy subjects undergoing antibiotic therapy. J Med Microbiol 58: 663-670.
12. Sang LX, Chang B, Zhang WL, Wu XM, Li XH, et al. (2010) Remission induction and maintenance effect of probiotics on ulcerative colitis: a meta-analysis. World J Gastroenterol: WJG 16: 1908-1915.
13. Klaenhammer TR, Kleerebezem M, Kopp MV, Rescigno M (2012) The impact of probiotics and prebiotics on the immune system. Nature Rev Immunol 12: 728-734.
14. Ouwehand AC, Lagstrom H, Suomalainen T, Salminen S (2002) Effect of probiotics on constipation, fecal azoreductase activity and fecal mucin content in the elderly. Ann Nutr Metab 46: 159-162.
15. Hemarajata P, Versalovic J (2013) Effects of probiotics on gut microbiota: mechanisms of intestinal immunomodulation and neuromodulation. Therap Adv Gastroenterol 6: 39-51.

Author Affiliation Top

Department of Food and Nutritional Disorders, University of New York, USA