



The Powerful Role of Nitrates and Nitric Oxide in Intestinal Health

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The gastrointestinal (GI) tract encompasses a complex balance of microbes, hormones, neurotransmitters, and enzymes. The health of our gastrointestinal system is dependent upon this balance and is extremely important for longevity and well-being. The GI system not only controls physical wellness, it also is integral to mental health. This is due to the gut-brain connection, the communication between the intestinal tract and the brain, which plays a critical role in our mental as well as physical well-being. Severe gut dysfunction could exacerbate the symptoms of brain disorders, significantly affecting quality of life.

The intestinal microbiome also influences metabolic and immune pathways, as well as genetic and epigenetic factors that shape all aspects of physiology. Disruption of the intestinal microbial ecosystem, known as dysbiosis, has major impacts in health. Dysbiosis has been associated not only with gastrointestinal, but also neurological, cardiovascular, respiratory, metabolic and oncological diseases. Therefore, a rich, diverse intestinal microbiome is essential to our mental, intestinal, and overall health. Yet, according to the Centers for Disease Control (CDC), five out of six individuals in the U.S. receive one antibiotic prescription each year. This leads to alteration of the microbiome and increases dysbiosis.

A nitrate-rich diet, which supports the nitrate to nitrite to nitric oxide pathway, may help prevent dysbiosis and promote gastrointestinal health as well as support the gut-brain axis and maintain homeostasis. Dietary nitrates and their metabolites are correlated with healthy oral, gut, and intestinal microbiota. Furthermore, nitrates may modulate inflammatory, immune, and oncological pathways. Nitrates also provide protection against toxicity induced by LPS (lipopolysaccharides), an endotoxin that increases proinflammatory cytokines and which is associated with a more permeable gut lining leading to leaky gut.

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