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HEART DISEASE
& THE GUT

WHITEPAPER



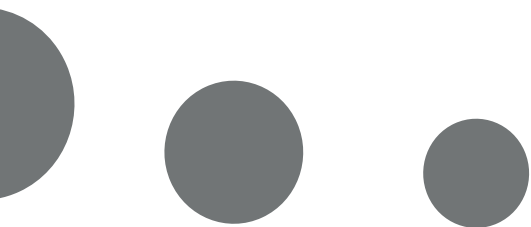
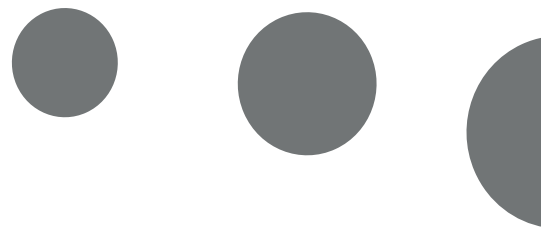
HEART DISEASE AND THE GUT

Heart disease or Cardiovascular disease (CVD) includes conditions affecting either the heart or its associated blood vessels. CVD is often associated with the accumulation of deposits such as fat or cholesterol on the walls of arteries, which restricts the blood supply to vital organs such as the brain and heart, impairing their function, the consequences of which can sometimes be lethal. CVD is currently one of the leading causes of death in the UK, with an estimated 7.4 million people living with CVD conditions across the UK. The risk factors for the development of CVD include; high blood pressure, smoking, high cholesterol (fatty food), excessive weight, diabetes and a lack of physical activity⁽¹⁷⁰⁾.

Some specific products of the gut microbiota have been implicated as creating a predisposition to cardiovascular risks. For example, trimethylamine (TMA) is produced by bacteria from dietary phosphatidylcholine and carnitine (compounds which are abundant in meat, eggs, fish and dairy). Trimethylamine is oxidised in the liver to trimethylamine N-oxide (TMAO). The presence of TMAO in the blood is correlated positively with the onset of cardiovascular events⁽¹⁴⁰⁾. Fortunately, simple modifications to diet are a feasible approach to lower the levels of TMAO, therefore reducing the risk of CVD.

Research points out that butyrate (one of the primary SCFAs) is a compound which is playing an important role in preventing CVD. The microbiota of individuals with CVD often demonstrate a reduced representation of bacterial species involved in the production of butyrate^(141, 142, 143). Reduced levels of butyrate may result in a weakening of the barrier function of the gut, promoting leakage of microbial toxins such as lipopolysaccharides (LPS) in the blood, sequentially triggering inflammation and cardiovascular event⁽¹⁶⁸⁾. Other SCFAs could also have relevance in the reduction of CVD risks - for instance, acetate was shown to improve cardiac function⁽¹⁶⁹⁾.





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