

Plant-based foods and Mediterranean diet associated with healthy gut microbiome

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Table 1. Summary of the key findings in relation to food or food pattern and effect on the gut microbiota.

Food/Food Pattern	Observed effect on gut microbiota
Plant-based diet	Associated with bacterial production of SCFAs, the main source of energy for the cells lining the colon.
Plant Protein	Associated with the biosynthesis of vitamins and amino acids and the degradation of sugar alcohols. Also associated with an increase in friendly bacteria <i>Bifidobacteria</i> and a decrease in <i>Blautia</i> and <i>Streptococci</i> .
Animal Protein	Associated with an increase in <i>Blautia</i> and <i>Streptococci</i> and a decrease in <i>Bifidobacteria</i> .
Low-fat fermented dairy	Associated with an increase of friendly bacteria and their functions: <i>Lactococcus lactis</i> , <i>Lactobacilli</i> and <i>Bifidobacterium bifidum</i> .
Mediterranean dietary pattern comprising plant protein, bread, legumes, vegetables, fish, nuts, wine	Associated with increased abundances of friendly bacteria <i>Roseburia hominis</i> , <i>Faecalibacterium prausnitzii</i> and <i>Bifidobacteria</i> and carbohydrate fermenting pathways which provide cells in the gut with energy.
Bread & Legumes, Fish & Nuts	Food combinations associated with a decrease in bacterial species that have been linked to inflammation and obesity: <i>Bacteroides fragilis</i> , <i>Escherichia coli</i> (<i>E.coli</i>), and <i>Clostridium bolteae</i> . Also associated with a decrease in functional pathways of aerobic bacteria and enterobacteria. Associated with reduced inflammatory markers in blood and stool.
Meat, potatoes & gravy, Sweets & table sugar, Fastfood & softdrinks	Food combinations associated with an increase in functional pathways of aerobic bacteria and enterobacteria. Associated with increased inflammatory markers in blood and stool.

A summary of the key findings in relation to food or food pattern and effect on the gut microbiota. Credit: UEG

A study presented at UEG Week 2019 has shown that specific foods could provide protection for the gut, by helping bacteria with anti-inflammatory properties to thrive.

Researchers from the University Medical Center Groningen, The Netherlands have found that certain foods including legumes, bread, fish, nuts and wine are associated with high levels of friendly gut bacteria that aids the biosynthesis of essential nutrients and the production of short-chain fatty acids (SCFAs), the main source of energy for cells lining the colon. The findings support the idea that the diet could be an effective management strategy for [intestinal diseases](#), through the modulation of the gut bacteria.

The experts observed four study groups, the [general population](#), patients with Crohn's [disease](#), ulcerative colitis and those with irritable bowel syndrome (IBS). The researchers analysed a stool

sample provided by each participant to reconstruct the host's microbiota and compared this with the results of a [food](#) frequency survey. The results identified 61 individual food items associated with microbial populations and 49 correlations between food patterns and microbial groups.

The experts found that:

- Dietary patterns rich in bread, legumes, fish and nuts, were associated with a decrease in potentially harmful, aerobic bacteria. Higher consumption of these foods was also associated with lower levels of inflammatory markers in stool that are known to rise during intestinal inflammation
- A higher intake of meat, fast foods or refined sugar was associated with a decrease in beneficial bacterial functions and an increase in inflammatory markers
- Red wine, legumes, vegetables, fruit, cereals, fish and nuts were associated with a higher abundance of bacteria with anti-inflammatory functions
- Plant-based diets were found to be associated with high levels of bacterial SCFA production, the main source of energy for cells lining the colon
- Plant protein was found to help the biosynthesis of vitamins and amino acids as well as the breaking down of sugar alcohols and ammonium excretion
- Animal-derived and plant-derived protein showed opposite associations on the gut microbiota

Gut microbiota:

Gut microbiota is the term given to the microbe population living in the intestine. Studies have shown that gut microbes play an important role in human health, including immune, metabolic and neurobehavioral traits. Links have also been made to obesity and a lack of diversity of the microbiota

has been shown in people with [inflammatory diseases](#) such as IBD, psoriatic arthritis, diabetes, atopic eczema, [coeliac disease](#) and arterial stiffness. In these diseases, certain diets have been implicated as [risk factors](#) and this new research indicates that gut microbiota may help explain the link between diet and disease.

The burden of intestinal diseases:

Intestinal diseases represent a significant cost burden to the European economy, population and healthcare systems. Approximately 3 million people in Europe are affected by IBD and it has an estimated direct healthcare cost of up to €5.6 billion. Obesity presents an even bigger public health concern, with over 50% of the European population considered overweight or obese and associated costs of €81 billion each year.

Commenting, lead researcher Laura Bolte said, "We looked in depth at the association between dietary patterns or individual foods and [gut microbiota](#). Connecting the diet to the gut microbiome gives us more insight into the relation between diet and intestinal disease. The results indicate that diet is likely to become a significant and serious line of treatment or disease management for diseases of the gut—by modulating the [gut microbiome](#)".

To conclude the dietary recommendations that could be derived from the study, Bolte added, "A diet characterised by nuts, fruits, greater vegetable and legume intake than animal protein, combined with moderate consumption of animal derived foods like fish, lean meat, poultry, fermented low fat dairy, and red wine, and a lower intake of red meat, processed meat and sweets, is beneficially associated with the gut ecosystem in our study."

Provided by United European Gastroenterology

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