

**Press Release 29<sup>th</sup> September 2015**

**Irish researchers collaborate with Italian colleagues to investigate the health benefits of a Mediterranean diet**

- Vegan and vegetarian diets are associated with health promoting short chain fatty acids, finds research published online in the journal *Gut*.
- High dietary intake of fibre-rich foods, such as fruit, vegetables, and legumes are associated with the production of SCFAs and a reduced production of trimethylamine oxide (TMAO), a molecule that is implicated with cardiovascular disease; even in people on the omnivore diets.
- Potential beneficial effects are not limited to vegetarian or vegan diets but are associated with the Mediterranean diet.

Researchers at the APC Microbiome Institute in University College Cork and University of Naples Federico II have shown that a Mediterranean diet rich in fruit and vegetables is linked to a rise in health promoting short chain fatty acids and the bacteria in the gut that make these compounds.

The Cork researchers provided the complex bioinformatic analysis in a study to assess the levels of gut bacteria and the “chemical fingerprints” (metabolites) in the stool and urine of 153 adults living in four geographically distant cities in Italy who were either omnivores (51), vegetarians (51) or vegans (51). Professor Paul O’Toole, Dr Ian Jeffery and their colleagues at the APC Microbiome Institute in Cork have amassed considerable experience in the analysis of gut bacteria in different populations, investigating the microbiota changes within different life stages including infants, people with chronic GI conditions, elite athletes and the elderly (the landmark ELDERMET project).

The Mediterranean diet is characterised by high intake of fruit, vegetables, legumes, nuts and cereals; moderately high intake of fish; regular but moderate alcohol consumption; and low intake of saturated fat, red meat, and dairy products. Most (88%) of the vegans, almost two thirds of the vegetarians (65%), and around a third (30%) of the omnivores consumed a diet with a high adherence to the traditional Mediterranean diet.

The researchers found that levels of SCFAs were strongly associated with the quantity of fruit, vegetables, legumes, and fibre habitually consumed, irrespective of whether the person was vegan, vegetarian or omnivorous. SCFAs have been linked to health promoting effects, including a reduced risk of inflammatory diseases, diabetes, and cardiovascular disease.

Vegetarian and vegans were found to have gut bacterial compositions associated with long-term fibre intake. Specifically, *Prevotella* and *Lachnospira*, known as good fibre-degrading organisms leading to the production of SCFA, were more linked to plant-based foods, which may explain the higher levels of SCFA found in vegans, vegetarians and in individuals with high-level adherence to the Mediterranean diet.

On the other hand, levels of trimethylamine oxide (TMAO)—a compound that has been linked to cardiovascular disease—were significantly lower in the urine samples of vegetarians and vegans than they were in those of the omnivores. However the analysis showed that the more omnivores followed a Mediterranean diet, the lower were their TMAO levels.

TMAO levels were also linked to the prevalence of microbes associated with the intake of animal

proteins and fat, including *L-Ruminococcus* (from the *Lachnospiraceae* family). Eggs, beef, pork and fish are the primary sources of carnitine and choline, compounds that are converted by gut microbes into trimethylamine, which is then processed by the liver and released into the circulation as TMAO.

“We provide here tangible evidence of the impact of a healthy diet and a Mediterranean dietary pattern on gut microbiota and on the beneficial regulation of microbial metabolism towards health maintenance” said Professor Danilo Ercolino, University of Naples Federico II, lead author of the study.

Professor Paul O’Toole, APC Microbiome Institute, Cork, added “You don’t have to be a vegetarian or vegan to reap some of the benefits of healthy eating. Western omnivore diets can be made more healthy when a threshold consumption level of plant foods is also included.”

**Notes for editors:**

**Original reference:** High-level adherence to a Mediterranean diet beneficially impacts the gut microbiota and associated metabolome doi 10.1136/gutjnl-2015-309957 *Gut* 29<sup>th</sup> September 2015 <http://gut.bmj.com/content/early/2015/09/03/gutjnl-2015-309957.full>

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**About the APC Microbiome Institute:**

*The APC Microbiome Institute <http://apc.ucc.ie/> in Cork, the national centre for excellence in food and medicine research, is one of Science Foundation Ireland’s national centres for research and it represents a partnership between UCC, Teagasc and CIT. Since its foundation in 2003 it has made several seminal contributions to the field and was ranked second in the world by Thomson Reuters for its area of science. In recognition of the significantly increased scale of APC activities and the importance of microbes in health, UCC has recently recognised the Cork scientists with the designation of institute (28 August 2015).*

*APC scientists carry out research on gastrointestinal bacterial community (the microbiome). The microbiome is not only a target for treatment and prevention of disease, it is a repository for functional food ingredients, new drugs and biomarkers of disease. Over the past decade APC scientists have related food and microbial diversity with health, have discovered new anti-microbials and anti-inflammatories and developed templates for future foods.*