The gut microbiota can influence the effectiveness of dietary treatments

November 10 2015, by Johanna Hillgren

Why a dietary treatment works for some but not others seems to depend on interactions between the gut microbiota and the diet. A new study, published in *Cell Metabolism*, shows that people with better control of blood sugar after eating barley kernel bread also have a different balance of microbes in the gut.

Dietary interventions can be used to improve the metabolism of humans,

and they also have a major impact on the gut microbiota. Previous studies at the Sahlgrenska Academy have shown that the gut microbiota is altered in metabolic diseases such as type 2 diabetes, and that the gut microbiota contributes to obesity, diabetes and cardiovascular disease.

Barley kernel bread

In a new study, 39 subjects ate barley kernel bread for three days followed by control bread made from white flour for three days (with a break between the two diets). The results showed that barley kernel bread improved the control of blood sugar, but only in some individuals.

Gut microbiota

Prevotella, a group of bacteria previously shown to be associated with high fiber intake, was present in higher proportions in those who responded beneficially to barley kernel bread than in those who did not respond to this dietary intervention.

By transferring the gut microbiota of these individuals to germ-free mice, the research group could demonstrate that the altered gut microbiota contributed to the beneficial effects of the barley kernel bread.

Metabolism

"Our findings clearly show the importance of the interaction between the gut microbiota and the diet and contribute to our understanding of metabolism in health and disease. The results may help to explain why responses to different dietary treatments are so individual," says Professor Fredrik Bäckhed at the Sahlgrenska Academy, University of Gothenburg.

Lund University participated

Bread with different fibers has attracted considerable interest and is a focus area at the Antidiabetic Food Center at Lund University (a VINN Excellence Center), which participated in the study.

"It is incredibly exciting to see the link between the gut microbiota and various dietary fibers, which can help us develop more individualized dietary guidelines," says Professor Inger Björk at Lund University.

Further studies

The researchers are now planning further studies and hope to confirm if the gut microbiota can identify which individuals will respond to a specific diet.

"Our results also show that control of blood sugar is improved in mice supplemented with Prevotella if they are given a high-fiber diet. Our findings could lead to a combination product with Prevotella and fiber from grains," says Fredrik Bäckhed at the Sahlgrenska Academy.

More information: The article Dietary fiber-induced improvement in glucose metabolism is associated with increased abundance of Prevotella is published in *Cell Metabolism* online on 5 November.

Provided by University of Gothenburg