

## Boosting chemical by-product of dietary fibre fermentation in gut slims and trims

Propionate-friendly fibre intake may offer new weight management option, say researchers

[Effects of targeted delivery of propionate to the human colon on appetite regulation, body weight maintenance and adiposity in overweight adults Online First: 11 Dec 2014. doi 10.1136/gutjnl-2014-307913]

Boosting levels of a naturally produced by-product of dietary fibre fermentation in the bowel can help trim the waistline and stave off weight gain, reveals a small study published online in the journal **Gut**.

This approach may offer a new weight management option, suggest the researchers.

Animal studies have shown that the natural fermentation of dietary fibre by gut bacteria produces short chain fatty acids, one of which is propionate.

These fatty acids stimulate the release of the gut hormones PYY and GLP-1, which in turn suppress appetite. And propionate seems to be the most effective at stimulating PYY and GLP-1 release.

To find out if increasing levels of propionate in the bowel could reduce food intake and stave off weight gain in people, the researchers developed a propionate supplement primed to target propionate release in the bowel.

First, 20 volunteers were given either the propionate supplement or just inulin, a predominantly fructose-containing plant fibre, and allowed to eat as much as they liked from a buffet. When given the propionate supplement, participants ate 14% less, on average, and had higher levels of PYY and GLP-1 in their blood.

Next, 60 overweight adults between the ages of 40 and 65 received either a daily 10 g dose of the propionate supplement or 10 g of inulin alone over a period of 24 weeks. They were asked to follow their normal dietary and exercise routines throughout.

Body weight was assessed at the beginning and end of the study period, as was the distribution of fat around the body.

A fasting blood sample was also taken to check on risk factors for cardiovascular disease and diabetes, including blood fats, liver enzymes, and markers of inflammation.

Forty nine of the original 60 participants completed the trial.

Among the 25 people taking the propionate supplement, just one put on more than 3% of their baseline weight, compared with six of the 24 treated with inulin alone.

Furthermore, the propionate supplement altered the distribution of body fat, significantly trimming abdominal fat tissue compared with inulin alone, and lowering the total amount of fat in the liver.

Both the propionate supplement and inulin cut the risk factors for cardiovascular disease and diabetes, although only the propionate supplement significantly reduced 'bad' low density cholesterol and the enzyme aspartate transaminase, high levels of which are associated with tissue damage, particularly of the heart and liver.

The evidence suggests that adults gain around half to 1 kilo in weight every year throughout middle age by just consuming 50-100 extra calories a day. And the findings provide the first direct evidence that raising propionate levels in the bowel can cut energy intake and stave off longer term weight gain, say the researchers.

“The present results support a role specifically for colonic propionate in weight management and may provide a molecular explanation of recent data that have observed changes in the gut [range of bacteria] and associated [short chain fatty acid production] profiles in weight loss,” they conclude.

**Contacts:**

Professor Gary Frost, Nutrition and Dietetic Research Group, Section of Investigative Medicine, Imperial College London, London UK.

Email: [g.frost@imperial.ac.uk](mailto:g.frost@imperial.ac.uk)

**Or**

Dr Douglas Morrison, Stable Isotope Biochemistry Laboratory, Scottish Universities Environmental Research Centre, University of Glasgow, Glasgow, UK.

Email: [Douglas.Morrison@glasgow.ac.uk](mailto:Douglas.Morrison@glasgow.ac.uk)