

A Natural Solution to Controlling Appetite - A New Approach by Birmingham Engineers to Tackle Obesity

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Scientists at the University of Birmingham's School of Chemical Engineering have developed an aqueous solution that gels into a solid structure in the stomach, curbing appetite.

The solution is formulated using a 'pH-sensitive' hydrocolloid. Hydrocolloids are naturally occurring polymers, like starch in bread, and are commonly consumed as part of our everyday diet. The specific type of hydrocolloid used in this work is commonly found in a wide range of foods and is eaten by millions of people every day.

Once this solution has been consumed, it is designed to respond to or take advantage of the stomach's acidic environment and turn itself into a gel. The strength of this gel is carefully controlled so it is firm enough to provide a prolonged sense of fullness – usually associated with the consumption of solid foods rather than liquid-like products such as thickened drinks. This is why, while this gel structure 'sits' in the stomach, it suppresses appetite, making the consumer feel full for longer, reducing the likelihood of snacking and eating unhealthy foods.

The approach taken is novel, as it reinforces the healthy habit of eating three square meals a day. It is different to most scientific efforts to date, which usually look at how to produce healthier equivalents of unhealthy foods by reducing their fat, sugar and salt content.

The Birmingham scientists have designed other mechanisms into the technology to get the gel structure to progressively weaken after a certain time of exposure to the stomach's acidic environment, and eventually break down and pass through the digestive tract. This is important as it will allow for the desire to eat to return in time for the normal consumption of lunch or dinner.

Dr Fotis Spyropoulos of the School of Chemical Engineering, who is working on the project, says 'The solution we designed takes advantage of the body's natural process of digestion to structure itself into a gel. We are now working on a key element of the formulation – how to get it to release energy slowly. This is a crucial part of our work since people would feel unhappy by having a full stomach but no reward from it in terms of energy.'

Dr Phil Cox from the University of Birmingham's School of Chemical Engineering, says, 'One way of tackling the rising levels of morbid obesity is to control consumers' energy intake from foods. The problem is that foods have become softer, easily digestible and less satiating, meaning that individuals feel hungry more quickly and want to eat again, often between meals.'

The researchers' aim is to see the new solution in a breakfast drink or a type of porridge, the consumer benefitting from feeling full, but still able to eat three meals a day.

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