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# You can't fool the human body when it comes to carbs

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Credit: Petr Kratochvil/public domain

(Medical Xpress)—That lack of 'kick' you feel when drinking diet beverages has a scientific basis: it seems the mouth is able to detect the presence or absence of carbohydrate even when a liquid tastes and smells identical to the real thing.

A new study by Dr Nick Gant's team from the Centre for Brain

Research at the University of Auckland provides yet more evidence that the brain knows far more about the foods we ingest that previously thought.

"Liquid solutions used in our study were sweetened artificially but when carbohydrate was present, we saw increased activation in the brain that we don't see when only sweetness is present," he says. "This helps explain the 'kick' people complain is absent in diet beverages or products.

"We may be able to use the experimental platform in this study to help develop functional foods and artificial sweeteners that are as hedonistically rewarding as the real thing."

The study used a unique brain imaging sequence to test the behavioural and neural response of ten participants who performed arm exercises while their mouths were rinsed with carbohydrate, artificial sweetener or placebo solution.

The study found a 30% increase in task-related brain activity when carbohydrate was present even though the liquid wasn't swallowed.

"This study provides further evidence of a "sixth taste sense" for carbohydrate by receptors in the human mouth. The mouth signals that energy is on its way which in turn leads to increased activity in key regions of the brain including those that control movement and vision."

The study findings could also explain why the 'perk up' response noted in athletes after they have drunk carbohydrate is immediate, even though the body hasn't had time to absorb it and convert it to energy.

"Carbohydrates are extremely powerful oral stimuli that have profound and immediate effects on the brain and the mouth is a more capable

sensory organ that we currently appreciate," Dr Gant says.

Brain networks that signal between the mouth and the brain are thought to break down in some eating disorders.

"Those responses are absent when nil by mouth patients are fed artificially and this help may explain why artificial nutrition therapy is less successful than ingesting food in the normal way."

Provided by University of Auckland

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