

Chewing habits determine blood sugar levels after a carbohydrate-rich meal

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Taking slower and fewer bites of a spoonful of rice releases less glucose into the bloodstream than quick and continuous chewing, show A*STAR researchers. Surges in blood sugar levels, known as the glycemic response, can increase a person's risk of developing obesity, heart disease and type 2 diabetes, which is of particular concern in Asia, a region accounting for 60 per cent of the global diabetic population.

"The old wives' tale to chew and chew and chew like a cow is actually counterproductive when it comes to glycemic response," says Christiani Jeyakumar Henry, who led the study together with colleague Yung Seng Lee at the A*STAR Singapore Institute for Clinical Sciences, and Verena Tan. "These results are gratifying because [chewing](#) time and frequency are behaviors that we can consciously change," adds Lee.

The glycemic response to food varies considerably between individuals. Henry and Lee wanted to identify non invasive ways for people to reduce this response. In a previous study on the mastication behavior of 11 Singaporeans, Henry found that smaller balls of white rice are chewed less before swallowing when using chopsticks instead of a spoon, which significantly reduces blood sugar levels.

In the current study, the researchers looked at the glycemic response of 75 healthy men served a bowl of basmati or jasmine rice. They compared chewing parameters of frequency and duration per mouthful, saliva content, and the time taken for food to clear the stomach.

Blood samples and saliva swabs were taken from the study participants before and after every meal. Their jaw movements were monitored via surface electrodes and stomach activity measured using an ultrasound machine.

For both types of rice, fewer bites per mouthful, at a slower chewing rate, were associated with lower blood sugar levels. Lee insists, however, that further intervention studies are needed to confirm the link between chewing and glycemic response.

Both the speed of stomach emptying and activity of salivary enzymes responsible for breaking down starch into smaller chains of glucose were not associated with changes in blood sugar levels.

Lee is currently also assessing stool samples of the participants for gut bacteria. "We want to identify the gut bacterial patterns that are associated with a higher or lower glycemic response."

Henry is keen to find more ways of manipulating [blood sugar](#) levels using local ingredients, for example by tricking people into chewing less and swallowing larger particles of rice by mixing the staple with peas, pistachios or nuts. "Food is the new medicine—that is our mantra," says Henry.

More information: Verena Ming Hui Tan et al. The role of digestive factors in determining glycemic response in a multiethnic Asian population, *European Journal of Nutrition* (2015). [DOI: 10.1007/s00394-015-0976-0](#)

Lijuan Sun et al. The impact of eating methods on eating rate and glycemic response in healthy adults, *Physiology & Behavior* (2015). [DOI: 10.1016/j.physbeh.2014.12.014](#)

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