

# Quality of overall diet is key to lowering type 2 diabetes risk

4 February 2019



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Consistent with studies in other populations, findings from the first local study, The Singapore Chinese Health Study, conducted by researchers in the National University of Singapore's (NUS) Saw Swee Hock School of Public Health and Duke-NUS Medical School, have shown that a high-quality diet defined by low intake of animal foods such as red meat, and high intake of plant foods such as vegetables, fruits and whole grains, and reduced intake of sweetened beverages could be associated with reduced risk of diabetes.

Diet is an important risk factor for type 2 diabetes. Studying the impact of individual [food](#) items, however, does not account for the synergistic effects of diverse foods consumed together. Hence, scientists have turned increasing attention to studying the overall dietary patterns in order to capture the combined effect of a variety of food groups.

Five predetermined dietary patterns originating in Western populations, i.e. the alternative Mediterranean diet (aMED, an international adaptation of the eponymous diet), the Alternate

Healthy Eating Index 2010 (AHEI-2010), the Dietary Approaches to Stop Hypertension (DASH) diet, the plant-based diet index (PDI) and the healthful plant-based diet index (hPDI), are similar in being rich in plant-based foods, including whole grains, vegetables and fruits, nuts and legumes, and low in red meat and sugar-sweetened beverages. These dietary patterns have been shown to reduce the risk of diabetes and cardiovascular diseases, and are considered high-quality dietary patterns.

Nested in the Singapore Chinese Health Study, researchers from NUS Saw Swee Hock School of Public Health and Duke-NUS Medical School used data from 45,511 middle-aged and elderly participants who did not have diabetes during recruitment between 1993 and 1998. From the reported intake of 165 food items, the participants were scored on how similar their diet patterns were to the five high-quality diets in terms of intake of specific foods and nutrients included in these patterns. The participants were followed up over an average of 11 years, and 5,207 cases of diabetes were reported at subsequent follow-up interviews.

The study, recently published in the *American Journal of Epidemiology*, found that all five high-quality dietary patterns were inversely associated with risk of diabetes. Study participants in the top 20 percent of scores for similarity to these healthy dietary patterns had a significant reduction of 16 per cent to 29 per cent in risk of diabetes compared to those who were in the lowest 20 per cent. However, this reduction in risk was attenuated in smokers.

"Our results are consistent with studies in other populations that a high-quality diet defined by an abundance of minimally processed plant foods such as whole grains, vegetables, fruit, nuts and legumes, but restricted intake of red and processed meat, and sweetened beverages were significantly associated with lower risk of diabetes," said Professor Rob van Dam, NUS Saw Swee Hock

School of Public Health, and senior author of the publication.

In a related study also nested in this Singapore Chinese Health Study, published recently in the *European Journal of Nutrition*, the investigators have found that although rice consumption was not associated with risk of diabetes, replacing one daily serving of rice with red meat or poultry may increase the risk of diabetes by up to 40 per cent. In contrast, the replacement of rice with wholemeal bread could reduce the risk by 18 per cent. "This is consistent with the recommendation of maintaining a healthy dietary pattern by choosing healthy food items to lower the risk of disease," said Professor Koh Woon Puay, Duke-NUS Medical School, and Principal Investigator of the Singapore Chinese Health Study. "Hence, although higher rice intake was not substantially associated with a higher risk of [diabetes](#), eating more rice could lessen the intake of whole grains, which could reduce the risk instead. Hence, it is still advisable to replace rice with whole grains such as wholemeal bread and brown rice."

These two local studies also reaffirm the importance of a quality diet and is aligned with the Health Promotion Board (HPB)'s strategic focus on encouraging Singaporeans to eat a healthy, well-balanced and quality diet by eating foods from all food groups, like fruits and vegetables, whole grains, such as brown rice and wholemeal bread, as well as meat and others. As part of a healthy diet, HPB also recommends that Singaporeans limit their consumption of sodium and sugars from both foods and beverages.

"These studies put a spotlight on the importance of a quality diet and are timely in the context of findings from the latest National Nutrition Survey 2018, which HPB had recently shared," said Dr. Annie Ling, Group Director of Policy, Research & Surveillance, HPB. "The survey showed gradual improvements in Singaporeans' dietary habits as well as areas where diet quality could be improved. While Singaporeans are consuming more wholegrain, fruits and vegetables, as well as substituting saturated fat with unsaturated fat, high sugar and sodium intake remains a cause for concern. It is therefore important to continue

encouraging Singaporeans to pay attention to the foods they choose and the quality of their [diet](#)."

**More information:** 1. Diet Quality Indices and Risk of Type 2 Diabetes Mellitus: The Singapore Chinese Health Study. Guo-Chong Chen, Woon-Puay Koh, Nithya Neelakantan, Jian-Min Yuan, Li-Qiang Qin, and Rob M. van Dam; *Am J Epidemiol*. 2018;187(12):2651–2661

2. Rice intake and risk of type 2 diabetes: The Singapore Chinese Health Study. Jowy YH Seah, Woon-Puay Koh, Jian-Min Yuan, Rob M van Dam; *Eur J Nutr* (2018), doi.org/10.1007/s00394-018-1879-7

Provided by Duke-NUS Medical School

APA citation: Quality of overall diet is key to lowering type 2 diabetes risk (2019, February 4) retrieved 26 September 2022 from <https://medicalxpress.com/news/2019-02-quality-diet-key-lowering-diabetes.html>

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