

More Whole Grains May Be Key to Lowering Diabetes Risk

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Eating more whole grain foods — rye bread, whole grain bread, or oatmeal/muesli — has been tied to having a lower risk of developing type 2 diabetes in a large study of middle-aged people in Denmark.

Among healthy 50- to 65-year-old Danes, those who ate the most of these whole grain foods (highest quartile) had about a 30% lower risk of developing type 2 diabetes by the time they were 65 to 80 years old compared with their peers in the lowest quartile of whole grain consumption.

Moreover, the association persisted whether the whole grains were rye, wheat, or oats.

The study from the Danish Diet, Cancer, and Health Cohort [was published](#) in the September issue of the *Journal of Nutrition*.

Studies in different populations "have consistently found that the intake of whole grains and cereal fiber is associated with a lower risk of type 2 diabetes and prediabetes," Cecilie Kyrø, PhD, from the Danish Cancer Society Research Center in Copenhagen, and colleagues write.

"Our findings are in line with accumulating evidence that whole grains may be one of the most important food groups for the prevention of type 2 diabetes,"

The results support "dietary advice, which recommends switching out foods containing white flour for whole grains," said senior author Rikard Landberg, PhD, Chalmers University of Technology, in Gothenburg, Sweden, in a press release from the university. "Whole grain has several positive effects beyond protection against type 2 diabetes."

Sacha Uelmen, RDN, CDE, Director of Nutrition for the American Diabetes Association, agreed in a comment to *Medscape Medical News*. "The take-home message is "choose more whole grains over processed grains," she said.

In the United States, dietitians advise people "when you choose grains, make most of them whole grains" and look for the "100% whole grain" stamp and the word "whole" in the ingredient list, she explained.

However, she was not convinced about the claim that whole grains may be one of the "most important foods" to ward off diabetes.

"Choosing whole grains over refined wheat products is definitely going to help. Saying that's the most important recommendation for people with diabetes — it would have to be individualized depending on what they normally eat."

Moreover, this is an observational study and cannot show cause and effect, she noted, and as the authors admit, unknown confounders might explain some of the findings. And the role of grains in the diet and the potential benefit of a low-carbohydrate diet remain controversial.

Nevertheless, this study is "food for thought" and "reinforces what we know," Uelmen said.

Rye, Wheat, and Oats

Whole grains include the starchy endosperm, germ, and bran, whereas refined grains lack the germ and bran, Kyrø and colleagues explain.

The researchers speculate that eating whole grain foods may lower the risk of type 2 diabetes "by improving insulin sensitivity, lowering postprandial glucose response, and possibly also lowering inflammation," which may be related to their high fiber content and positive effect on the gut microbiota.

However, most previous studies were conducted in the United States, where people mainly get their whole grain from wheat, Landberg noted.

"We wanted to see if there was a difference between different cereals," he explained, "since they contain different types of dietary fiber and bioactive substances that influence risk factors for type 2 diabetes."

On average, the researchers note, adults in the United States eat less than 16 g/day of whole grains, and those in the United Kingdom consume 27 g/day — mainly from wheat.

In contrast, in Denmark, adults eat an average of 33 g/day (in 2000-2004) to 58 g/day (in 2011-2013) of whole grains — mainly a dense rye bread but also whole-wheat bread and oatmeal/muesli.

The researchers defined a serving of whole grains as 16 g, where one slice of rye bread equals 50 g of whole grains, one slice of whole wheat bread equals 40 g of whole grains, and one serving of oatmeal/muesli equals 35 g of whole grains.

The highest quartile of whole grain intake in the United States would be at the level of the lowest quartile of whole grain intake in Denmark, according to Landberg, adding that "in Europe, Scandinavians eat the most [whole grains]; Spanish and Italians, the least."

Large Number of Participants, 15-Year Follow-up

The study enrolled 26,251 men and 29,214 women living in Copenhagen or Aarhus in 1993 to 1997. Participants completed a lifestyle questionnaire that included questions about smoking and exercise, and a 192-item food frequency questionnaire.

Participants were divided into quartiles of whole grain consumption by gender.

Men had a median whole grain intake of 42 g/day, ranging from ≤ 27 g/day (lowest quartile) to ≥ 60 g/day (highest quartile).

Women had a median whole grain intake of 34 g/day, ranging from ≤ 24 g/day to ≥ 50.8 g/day.

Men and women in the highest quartiles of whole grain intake also had a lower body mass index, were more educated, and were less likely to smoke.

During a median 15-year follow-up, 15.7% of the men and 11.3% of the women (7417 participants) were diagnosed with type 2 diabetes.

Men in the highest quartile of whole grain intake had a 34% lower risk of being diagnosed with type 2 diabetes than men in the lowest quartile.

Similarly, women in the highest quartile of whole grain intake had a 22% lower risk of the outcome than women in the lowest quartile.

In both genders the risk was assessed after adjustment for age, education, physical activity, smoking, alcohol consumption, intake of red and processed meat, body mass index, and in women, menopause and hormone replacement.

The association persisted after further adjustment for dietary glycemic index and intake of dietary fiber, magnesium, leafy vegetables, dairy products, sugar-sweetened beverages, coffee, and vitamin D.

And the association remained whether the source of whole grain was rye bread, whole grain bread, or oatmeal/muesli.

Each additional 16 g/day intake of whole grains was associated with an 11% and 7% lower risk of being diagnosed with type 2 diabetes for men and women, respectively.

The inverse association between whole grain intake and risk of diabetes was seen with "both soluble fiber (oats) and insoluble fiber (wheat and rye)," which "suggests that numerous mechanisms may explain the findings," the researchers write.

The study showed "robust associations" between whole grains and risk of type 2 diabetes.

"Thus, given the large prevalence of type 2 diabetes, increasing whole-grain intake should be recommended at the population level."

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