Dairy products in moderate amounts may protect against type 2 diabetes: Red and processed meat may raise risk

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New research being presented at the annual meeting of the European Association for the Study of Diabetes in Stockholm, Sweden (19-23 Sept) shows that dairy products, especially low-fat products and yogurt,

are associated with a lower risk of developing type 2 diabetes (T2D).

Red and processed meat were linked to a higher risk of T2D but moderate amounts of fish and eggs could be eaten in their place, say the Italian researchers.

T2D is the most common form of diabetes and it occurs when the pancreas can't make enough insulin (the hormone which promotes the absorption of glucose from blood into the body's cells, maintaining normal blood sugar levels) and/or the insulin it makes doesn't work properly (low insulin sensitivity).

Overweight and obesity are the main risk factors and incidence of T2D is projected to increase. Common complications include heart disease, kidney disease, vision loss and circulatory problems which can lead to foot amputation.

Existing dietary guidelines for the prevention of T2D recommend eating specific plant-based foods such as whole grains, vegetables, fruits, legumes, olive oil and typically advise limiting consumption of most animal products.

However, not all sources of animal protein are nutritionally equal. Knowing how different animal products are associated with T2D would allow the guidelines to be updated, making it easier for people to choose the best foods to cut their risk of diabetes.

To do this, Dr. Annalisa Giosuè, of the Department of Clinical Medicine and Surgery, University of Naples Federico II, Naples, Italy, and colleagues carried out a review of existing meta-analyses into links between different animal-based foods and diabetes. This type of "review of reviews" provides one of the highest levels of evidence available in medicine.

The PubMed, Web of Science, Scopus and Embase databases were searched for dose-response meta-analyses of studies into the relationship between different foods and T2D.

The 13 meta-analyses that were suitable contained 175 estimates of how much 12 different animal products (total meat, red meat, white meat, processed meat, fish, total dairy, full-fat dairy, low-fat dairy, milk, cheese, yogurt and eggs) may increase or reduce the risk of developing T2D. (Red meat includes beef, lamb and pork, while white meat includes chicken and turkey. Processed meat includes bacon, sausages, and deli meat.)

There was a substantial increase in T2D risk with the consumption of 100 g/day of total meat (20% increase in risk) and 100 g/day of red meat (22% increase) and with 50 g/day of processed meats (30% increase). The quality of evidence was moderate.

A daily amount of 50g of white meat was associated with a smaller increase in T2D risk (4%).

Dr. Giosuè says, "There are several potential reasons for this. For example, red and processed meat are important sources of components like saturated fatty acids, cholesterol and haem iron, all known to promote chronic low-level inflammation and oxidative stress, which in turn can reduce the sensitivity of the cells to insulin.

"Processed meats also contain nitrates, nitrites and sodium, which, among other adverse effects, can damage the insulin-producing cells of the pancreas.

"White meat, in comparison, has a lower fat content, a more favorable fatty acid profile and a lower amount of haem iron."

Dairy foods, in contrast, appeared to protect against T2D or had a neutral relationship with the development of the condition.

Milk (200 g/day) was associated with a 10% reduction in risk, total dairy (200 g/day) with a 5% reduction in risk and low-fat dairy (200 g/day) with a 3% reduction. Yogurt (100 g/day) was associated with a 6% reduction in risk.

Cheese (30 g/day) and full-fat dairy (200 g/day) were found to have no effect on the risk of T2D. The quality of evidence was moderate to low.

Dr. Giosuè says, "Dairy products are rich in nutrients, vitamins and other bioactive compounds, which may favorably influence glucose metabolism—the processing of sugar by the body.

"For example, whey proteins in milk are known to modulate the rise of blood sugar levels after eating.

"Probiotics are also known to exert beneficial effects on glucose metabolism, which may explain why we found that a regular consumption of yogurt is associated with a reduced risk of type 2 diabetes."

She adds that although the results suggest that low-fat dairy products are more beneficial than full-fat dairy products, the finding should be treated cautiously, due to the small size of the reduction in risk and the low quality of the evidence.

A daily amount of 100 g of fish and one egg per day also showed neutral association with T2D risk, with low quality of evidence.

Dr. Giosuè says, "Type 2 diabetes is one of the major causes of diet-related death worldwide. Learning more about how different dietary

components increase or decrease the risk of type 2 diabetes is key to its prevention.

"Although more well-conducted research is needed to achieve high quality of evidence required to give solid recommendations, our extensive review of the scientific evidence shows that regular consumption of dairy foods in moderate amounts, especially low-fat products, milk and yogurt, may help reduce the risk of type 2 diabetes.

"It is also clear that while red and processed meat should be eaten sparingly, moderate amounts of fish and eggs could be good substitutes."

More information: 3. Prevention or Delay of Type 2 Diabetes and Associated Comorbidities: Standards of Medical Care in Diabetes—2022, *Diabetes Care* (2021). DOI: 10.2337/dc22-S003

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