Recent Evidence on Red Meat, Protein, and Diabetes

THINKBEEF

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Many important studies that have examined red meat and protein intake in relation to diabetes risk show:

- Unprocessed red meat fits within a diabetes-friendly diet; and,
- Higher protein intakes can benefit people with and at risk of diabetes.

RED MEAT AND DIABETES

2024 – A Mendelian randomization study found no evidence of a causal link between red meat (beef, pork, and lamb) consumption and the development of type 2 diabetes or cardiovascular disease (heart disease, high blood pressure, and stroke).

Li G, Jiang J and Li Z. The relationship between processed meat, red meat, and risk of cardiovascular disease and type 2 diabetes: a Mendelian randomization study. Eur J Prev Cardiol 2024: Online ahead of print. Doi: 10.1093/eurjpc/zwae117.

2023 - A meta-analysis of 21 randomized controlled trials (RCTs) concluded red meat had no adverse effect on a range of blood makers for type 2 diabetes, such as fasting blood glucose, HbA1c, fasting insulin and insulin sensitivity, compared to diets with less or no red meat.

Sanders LM, Wilcox ML and Maki KC. Red meat consumption and risk factors for type 2 diabetes: a systematic review and meta-analysis of randomized controlled trials. Eur J Clin Nutr 2023;77(2):156-165.

2022 - A Burden of Proof meta-analysis using rigorous methodology concluded there is weak to no evidence of association between unprocessed red meat and type 2 diabetes, heart disease, colorectal cancer, breast cancer, or the two main types of stroke.

Lescinsky H et al. Health effects associated with consumption of unprocessed red meat: a Burden of Proof study. Nat Med 2022;28:2075–2082.

2021 – A meta-analysis of 20 RCTs concluded red meat had no adverse effect on blood sugar control or inflammation in adults at risk of diabetes, heart disease and stroke. This meta-analysis found no benefit of replacing unprocessed red meat with other animal or plant proteins such as poultry or soy.

O'Connor LE et al. Effects of total red meat intake on glycemic control and inflammatory biomarkers: a meta-analysis of randomized controlled trials. Adv Nutr 2021;12:115-127.

2021 – A RCT conducted in adults with type 2 diabetes found that compared to eating soybean or non-soy legumes, eating a moderate amount of unprocessed red meat (i.e., 337 g/week), as part of a balanced diet had no adverse effect on a range of cardio-metabolic risk factors including fasting blood glucose, HbA1c, fasting insulin, insulin sensitivity, cholesterol levels, and blood pressure.

Hassanzadeh-Rostamiz Z et al. Moderate consumption of red meat, compared to soy or non-soy legume, has no adverse effect on cardio-metabolic factors in patients with type 2 diabetes. Exp Clin Endocrinol Diabetes 2021;129(6):429-437.

2019 - An expert panel concluded there is little to no health benefits for reducing red meat based on a series of 5 high-quality reviews on red meat and chronic diseases including diabetes, heart disease, and cancer. They suggest most adults in North America and Europe can continue to eat red meat at current average intakes, about 3 to 4 times a week.

Johnston BC et al. Unprocessed red meat and processed meat consumption: dietary guideline recommendations from the Nutritional Recommendations (NutriRECS) Consortium. Ann Intern Med 2019;171:756-764.

PROTEIN INTAKE AND DIABETES

2024 – A systematic review concluded high-protein diets are effective for reducing high blood glucose in patients with type 2 diabetes. The authors recommend a high-protein diet (with >30% of total energy) to improve blood glucose and achieve a healthier metabolic profile.

Flores-Hernández MN et al. Efficacy of a high-protein diet to lower glycemic levels in type 2 diabetes mellitus: a systematic review. Int J Mol Sci 2024;25(20):1095

2024 – A meal rich in protein and lower in carbohydrate proved to be closest to optimal for minimizing blood glucose and related hormonal responses. This diet trial fed meals with varying amounts of macronutrients and fibre to people with and without type 2 diabetes. Meals rich in protein provided the most beneficial effects compared to meals rich in carbohydrate or fibre.

Ekberg NR, Catrina SB and Spégel P. A protein-rich meal provides beneficial glycemic and hormonal responses as compared to meals enriched in carbohydrate, fat or fiber, in individuals with or without type-2 diabetes. Front Nutr 2024;11:1395745.

2023 - A weight loss RCT showed calorie-restricted diets with moderate or high amounts of protein (21% or 40% of total energy) combined with regular exercise are an effective way to help adults with type 2 diabetes lose weight and improve body composition, blood glucose control, and cardiometabolic health. A higher protein diet with beef at least 4 times a week was as effective as the moderate protein diet with no red meat.

Clina JG et al. High- and normal-protein diets improve body composition and glucose control in adults with type 2 diabetes: a randomized trial. Obesity 2023; 31(8):2021-2030.

2021 - A 6-month RCT in obese adults with pre-diabetes showed 100% of those eating a high protein diet experienced remission of pre-diabetes compared to only 33% on a high carbohydrate diet. The high protein diet increased the hormones GLP-1 and GIP, which the authors suggest may be responsible in part for improved insulin sensitivity and β cell function compared to the high carbohydrate diet. Based on the results for the hunger hormone ghrelin, they concluded the high protein diet can reduce hunger more effectively than the high carbohydrate diet.

Stentz FB et al. High protein diet leads to prediabetes remission and positive changes in incretins and cardiovascular risk factors. Nutr Metab Cardiovascular Dis 2021;31(4):1227-1237.

2016 – As reported in their more recent paper above, this 6-month RCT in obese adults with prediabetes found 100% of those eating a high protein diet (30% protein, 30% fat, 40% carbohydrate) experienced remission of prediabetes to normal glucose tolerance, compared to only 33% of those eating a high carbohydrate diet (15% protein, 30% fat, 55% carbohydrate). This study showed the high protein diet improved insulin sensitivity, lean body mass, cardiovascular risk factors, and inflammatory markers.

Stentz FB et al. Remission of pre-diabetes to normal glucose tolerance in obese adults with high protein versus high carbohydrate diet: randomized control trial. BMJ Open Diabetes Res Care 2016;4(1):e000258.

BEEF - A GOOD CHOICE TO FILL THE PROTEIN PORTION OF THE PLATE

These findings suggest that eating a moderate amount of unprocessed red meat does not increase the risk of diabetes. Canadians are already eating a moderate amount of unprocessed red meat on average. Beef is an excellent source of protein that provides a wide range of essential vitamins and minerals.