

# Glycemic Index

## **An excellent overview from the Mayo Clinic:**

<https://www.mayoclinic.org/healthy-lifestyle/nutrition-and-healthy-eating/in-depth/glycemic-index-diet/art-20048478>

## **The University of Sydney website. They maintain a repository of glycemic index data.**

<http://www.glycemicindex.com/about.php>

## **A more recent study looking at variation within an individual in the measure of glycemic index:**

<http://ajcn.nutrition.org/content/104/4/1004>

## **From Dynamed Plus:**

### **Cochrane review**

- **low glycemic index diet reduces HbA1c ([level 3 \[lacking direct\] evidence](#)) and may reduce episodes of hypoglycemia ([level 2 \[mid-level\] evidence](#))**
  - based on Cochrane review of trials with unclear allocation concealment
  - systematic review of 11 randomized trials evaluating low glycemic diet for  $\geq 4$  weeks in 402 patients with type 1 or type 2 diabetes not optimally controlled
  - all trials had unclear allocation concealment, only 1 trial had reported method of randomization
  - low glycemic diet associated with decreased HbA1c in analysis of 6 trials with 247 patients (weighted mean difference -0.5%, 95% CI -0.9 to -0.1%,  $p = 0.0013$ )
  - episodes of hypoglycemia significantly fewer with low glycemic index diet compared to control diet (1 trial) and compared to measured carbohydrate exchange diet (1 trial)
  - no trials reported on mortality, morbidity, or costs
  - Reference - [Cochrane Database Syst Rev 2009 Jan 21;\(1\):CD006296](#)

### **Randomized trials**

- **low glycemic index diet associated with modest improvement in glycemic control and HDL cholesterol compared to high-cereal fiber diet ([level 3 \[lacking direct\] evidence](#))**
  - based on randomized trial without clinical outcomes
  - 210 persons with diabetes type 2 treated with antihyperglycemic medication randomized to low glycemic index vs. high cereal fiber diet
  - dietary instruction given at baseline, then patients presented food diaries at week 2, week 4 and then monthly for 6 months
  - 74% completed trial
  - comparing low glycemic index vs. high cereal fiber
    - mean decrease in HbA1c 0.5% vs. 0.18% ( $p < 0.001$ )
    - mean change in HDL cholesterol +1.7 vs. -0.2 mg/dL ( $p = 0.005$ )

- Reference - [JAMA 2008 Dec 17;300\(23\):2742](#), commentary can be found in [JAMA 2009 Apr 15;301\(15\):1538](#), [Evid Based Med 2009 Jun;14\(3\):72](#)
- **low glycemic index legume diet associated with slight improvement in glycemic control compared with high insoluble fiber diet (level 3 [lacking direct] evidence)**
  - based on randomized trial without clinical outcomes
  - 121 patients with type 2 diabetes randomized to low glycemic index legume diet (increase in legume intake by  $\geq 1$  cup per day) vs. high insoluble fiber diet (increase in consumption of whole wheat products) for 3 months
  - reduction in HbA1c by 0.5% for low glycemic index legume diet vs. 0.3% for high insoluble fiber diet ( $p < 0.05$ )
  - Reference - [Arch Intern Med 2012 Nov 26;172\(21\):1653](#), editorial can be found in [Arch Intern Med 2012 Nov 26;172\(21\):1660](#)
- **low glycemic index dietary carbohydrate not associated with change in glycemic control (level 3 [lacking direct] evidence)**
  - based on randomized trial without clinical outcomes
  - 162 patients with diabetes type 2 managed by diet alone randomized to high-carbohydrate, high-glycemic index (high-GI) vs. high-carbohydrate, low-GI vs. low-carbohydrate, high-monounsaturated-fat diets for 1 year
  - no significant difference in HbA1c levels between diets
  - mean C-reactive protein and 2-hour postload glucose levels lower with low-GI diet
  - Reference - [Am J Clin Nutr 2008 Jan;87\(1\):114](#), editorial can be found in [Am J Clin Nutr 2008 Jan;87\(1\):1](#), commentary can be found in [Evid Based Med 2008 Aug;13\(4\):107](#)
- **meals with low glycemic index may reduce average daily glucose and/or hyperinsulinism (level 3 [lacking direct] evidence)**
  - based on small studies without clinical outcomes
  - low-biologically-available-glucose diet (high-protein/low-carbohydrate) for 5 weeks reduced average daily glucose (198 vs. 126 mg/dL [11-7 mmol/L]) and HbA1c (9.8% vs. 7.6%) in randomized crossover trial of 8 men with type 2 diabetes ([Diabetes 2004 Sep;53\(9\):2375](#))
  - consumption of meals with low glycemic index (rate of carbohydrate absorption after a meal) may reduce hyperinsulinism, but evidence limited to small studies with methodologic problems ([JAMA 2002 May 8;287\(18\):2414](#)), commentary can be found in [JAMA 2002 Aug 14;288\(6\):695](#), editorial discussion can be found in [JAMA 2009 Dec 9;302\(22\):2477](#)
- **glycemic index-based nutritional education associated with modest improvement in glycemic control compared to conventional nutrition education (level 3 [lacking direct] evidence)**
  - based on randomized trial without clinical outcomes
  - 40 patients with fasting plasma glucose 110-160 mg/dL (6.11-8.88 mmol/L) or HbA1c 5.8%-8% were randomized to glycemic index-based nutritional education vs. conventional nutrition education
  - mean reduction in HbA1c 0.46% in glycemic index education group vs. 0.21% in control group ( $p < 0.001$ )
  - Reference - [Diabetes Care 2007 Jul;30\(7\):1874](#)

