

Effects of Glycemic Load on Metabolic Health and Type 2 Diabetes Mellitus

Christian K. Roberts, Ph.D.,^{1,2,3} and Simin Liu, M.D., Sc.D.^{1,3,4}

Abstract

A large body of epidemiologic evidence has demonstrated that the combination of a Western diet and lifestyle is primarily responsible for the increased metabolic disease risk, such as obesity, type 2 diabetes mellitus (T2DM), and metabolic syndrome, noted in society today. Thus finding optimal intervention strategies to combat these growing epidemics is imperative. Despite some controversy, a growing body of literature indicates that one aspect of diet that likely affects phenotypic outcomes and metabolic disease risk is the glycemic load (GL). This brief review will provide an overview of the GL concept, discuss epidemiologic work investigating relationships between both GL and metabolic risk factors, as well as intervention studies that have assessed the impact of GL on phenotypic outcomes related to T2DM and cardiovascular disease. Overall, a low dietary GL may be protective against metabolic disease and should be considered as a healthful dietary component.

J Diabetes Sci Technol 2009;3(4):697-704

Author Affiliations: ¹Program on Genomics and Nutrition, Department of Epidemiology, University of California, Los Angeles, School of Public Health, Los Angeles, California; ²Department of Physiological Science, University of California, Los Angeles, Los Angeles, California; and ³Center for Metabolic Disease Prevention, University of California, Los Angeles, Los Angeles, California ⁴Department of Medicine, David Geffen School of Medicine, University of California, Los Angeles, Los Angeles, California

Abbreviations: (ARIC) Atherosclerosis Risk in Communities, (BMI) body mass index, (CHD) coronary heart disease, (CRP) C-reactive protein, (GI) glycemic index, (GL) glycemic load, (HDL) high-density lipoprotein, (HOMA-IR) homeostasis-model assessment for insulin resistance, (HPFS) Health Professionals Follow-Up Study, (IL-6) interleukin-6, (LDL) low-density lipoprotein, (NF-κB) nuclear-factor kappa-B, (NHS) Nurses' Health Study, (PAI-1) plasminogen activator inhibitor 1, (T2DM) type 2 diabetes mellitus, (TG) fasting triglyceride, (TNF-R2) tumor necrosis factor receptor-2

Keywords: carbohydrate, cardiovascular disease, diet, fiber, metabolic syndrome, obesity

Corresponding Author: Simin Liu, M.D., Sc.D., Program on Genomics and Nutrition, UCLA School of Public Health, Box 951772, 650 Charles E. Young Dr. S., Los Angeles, CA 90095-1772; email address siminliu@ucla.edu