individualized eating plan that includes all components necessary for optimal nutrition (4,9).

The amount of carbohydrate intake required for optimal health in humans is unknown. Although the recommended dietary allowance for carbohydrate for adults without diabetes (19 years and older) is 130 g/day and is determined in part by the brain's requirement for glucose, this energy requirement can be fulfilled by the body's metabolic processes, which include glycogenolysis, gluconeogenesis (via metabolism of the glycerol component of fat or gluconeogenic amino acids in protein), and/or ketogenesis in the setting of very low dietary carbohydrate intake (49).

What are the dietary fiber needs of people with diabetes?

The regular intake of sufficient dietary fiber is associated with lower all-cause mortality in people with diabetes (51,52). Therefore, people with diabetes should consume at least the amount of fiber recommended by the DGA 2015–2020 (minimum of 14 g of fiber per 1,000 kcal) with at least half of grain consumption being whole intact grains (8). Other sources of dietary fiber include nonstarchy vegetables, avocados, fruits, and berries, as well as pulses such as beans, peas, and lentils.

A few studies have shown modest A1C reduction (−0.2% to −0.3%) (53, 54) with intake in excess of 50 g of fiber per day. However, such very high intake of fiber may cause flatulence, bloating, and diarrhea. Meeting the recommended fiber intake through foods that are naturally high in dietary fiber, as compared with supplementation, is encouraged for the additional benefits of coexisting micronutrients and phytochemicals (55).

Does the use of glycemic index and glycemic load impact glycemia?

The use of the glycemic index (GI) and glycemic load (GL) to rank carbohydrate foods according to their effects on glycemia continues to be of interest for people with diabetes and those at risk for diabetes. As defined by Brand-Miller et al. (56), "the GI provides a good summary of postprandial glycemia. It predicts the peak (or near peak) response, the maximum glucose fluctuation, and other attributes of the response curve." Two systematic reviews of the literature regarding GI and GL in individuals with diabetes and at risk for diabetes reported no significant impact on A1C and mixed results on fasting glucose (9,50). Further, studies have used varying definitions of low and high GI foods, leading to uncertainty in the utility of GI and GL in clinical care (45).

What are the total protein needs of people with diabetes?

There is limited research in people with diabetes or prediabetes without kidney disease on the impact of various amounts of protein consumed. Some comparisons of protein amounts have not demonstrated differences in diabetes-related outcomes (57–60). A 12-week study comparing 30% vs. 15% energy from protein noted improvements in weight, fasting glucose, and insulin requirements in the group that consumed 30% energy from protein (61). A meta-analysis from 2013 of studies ranging from 4–24 weeks in duration reported that high-protein eating plans (25–32% of total energy vs. 15–20%) resulted in 2 kg greater weight loss and 0.5% greater improvement in A1C but no statistically significant improvements in fasting serum glucose, serum lipid profiles, or blood pressure (62).

What are the dietary fat and cholesterol goals for people with diabetes?

The National Academy of Medicine has defined an acceptable macronutrient distribution for total fat for all adults to be 20–35% of total calorie intake (49). Eating patterns that replace certain carbohydrate foods with those higher in total fat, however, have demonstrated greater improvements in glycemia and certain CVD risk factors (serum HDL cholesterol [HDL-C] and triglycerides) compared with lower fat diets. The types or quality of fats in the eating plans may influence CVD outcomes beyond the total amount of fat (63). Foods containing synthetic sources of *trans* fats should be minimized to the greatest extent possible (8). Ruminant *trans* fats, occurring naturally in meat and dairy products, do not need to be eliminated because they are present in such small quantities (64).

The body makes enough cholesterol for physiological and structural functions such that people do not need to obtain cholesterol through foods. Although the DGA concluded that available evidence does not support the recommendation to limit dietary cholesterol for the general population, exact recommendations for dietary cholesterol for other populations, such as people with diabetes, are not as clear (8). Whereas cholesterol intake has correlated with serum cholesterol levels, it has not correlated well with CVD events (65,66). More research is needed regarding the relationship among dietary cholesterol, blood cholesterol, and CVD events in people with diabetes.

What is the role of fat in the prevention of type 2 diabetes?

Large epidemiologic studies have found that consumption of polyunsaturated fat or biomarkers of polyunsaturated fatty acids are associated with lower risk of type 2 diabetes (67). Supplementation with omega-3 fatty acids in prediabetes has demonstrated some efficacy in surrogate outcomes beyond serum triglyceride levels. In a single-blinded RCT design in Asia, 107 subjects with newly diagnosed impaired glucose metabolism and coronary heart disease (CHD) supplemented with 1,800 mg/day of eicosapentaenoic acid (EPA) experienced improved postprandial triglycerides, glycemia, insulin secretion ability, and endothelial function over a 6-month period (68). Further, in a recent multisite RCT that included 57% of participants with diabetes, age 50 years or older, and with at least one additional CVD risk factor, plus elevated fasting triglycerides and low HDL-C, benefits were seen from adding 2 g of icosapent ethyl twice daily to statin therapy in terms of lower rates of a composite CVD outcome and CVD mortality, but there were also slightly higher rates of hospitalization for atrial fibrillation and serious bleeding (68a).

The intervention in the PREvención con DIeta MEDiterránea (PREDIMED) study, comparing a Mediterranean-style eating pattern supplemented either with extra-virgin olive oil or with nuts versus a control diet, reduced incidence of type 2 diabetes among people without diabetes at high cardiovascular risk at baseline (69). The Malmö Diet and Cancer cohort study examined specific food sources of saturated fat and found that intake of saturated fat from dairy products, coconut oil, and palm kernel oil were associated with lower diabetes risk (70), whereas saturated fat intake was associated with higher risk of diabetes in