Oats & Health: From Farm to Fork

Chu YF

Quaker Oats Center of Excellence, PepsiCo R&D Nutrition, Barrington, IL, USA

Considerable research has been published on the health effects of oats, particularly on oats' effects on cardiovascular risk factors and indices of carbohydrate metabolism (e.g., glucose, insulin levels). Additionally, work in nascent areas such as post-prandial glycemic responses as well as the antioxidant and anti-inflammatory properties of oats have been noteworthy. Furthermore, the relationship between the physical characteristics of oats (e.g., viscosity, molecular weight) and their health effects has been explored in greater detail. Key research findings regarding the purported mechanisms for the health effects of oats and oat components are summarized in this abstract. For cardiovascular risks, consumption of 3-6 g/day oat β-glucan significantly lowers the atherogenic lipid profile, including low-density lipoprotein cholesterol (LDL-C), non-high-density lipoprotein cholesterol (non-HDL-C), small dense LDL, LDL particle number, and apolipoprotein B. Oat consumption has also been associated with increases in HDL-C in studies of hypertriglyceridemic individuals. Data on the effects of oats and oat components on blood pressure are inconsistent, but some studies have found a modest hypotensive effect in obese subjects and in individuals with treated hypertension. Data on the impact of oat and β-glucan consumption on glucose homeostasis are conclusive. Several well-controlled clinical trials have suggested a beneficial, dose-related effect on postprandial glucose levels (in contrast to fasting values), especially when oat products (versus β-glucan) are consumed. Data are also clear that oat consumption improves subject satiety (i.e., hunger and fullness). However, it is unclear what the potential long-term effects of oat consumption (or its constituents) are on modulating weight gain in adults. Several *in vitro* studies have shown that oats can affect gut microbial metabolism in ways that may benefit gut and whole-body health; however, studies on laxation have not yielded positive results. It is possible that the physicochemical characteristics of oats affect fermentability. There is a small, but increasing, number of well-designed clinical studies investigating the potential for oats to serve as dietary antioxidative and/or anti-inflammatory substances. Emerging *in vitro* data suggest plausible and potential physiologically relevant effects. There is a growing appreciation for the relationship between the physicochemical properties of oats/oat fractions and health-related variables, particularly in emerging areas such as satiety, glycemic response management, and antioxidant potential. A recent study indicated that processors may be able to improve the physicochemical and nutritional properties of oat end products through processing of specific oat genotypes from select growing locations. Positive physiological outcomes may eventually be dependent on processing, variety selection, and preparation before consumption. To conclude, from farm to fork, the impact of each step should carefully be studied to help food companies design and deliver products that can provide the most health benefits to consumers.