

SPECIAL FOCUS ISSUE: CARDIOVASCULAR HEALTH PROMOTION

THE PRESENT AND FUTURE: COUNCIL PERSPECTIVES

Trending Cardiovascular Nutrition Controversies



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ABSTRACT

The potential cardiovascular benefits of several trending foods and dietary patterns are still incompletely understood, and nutritional science continues to evolve. However, in the meantime, a number of controversial dietary patterns, foods, and nutrients have received significant media exposure and are mired by hype. This review addresses some of the more popular foods and dietary patterns that are promoted for cardiovascular health to provide clinicians with accurate information for patient discussions in the clinical setting. (J Am Coll Cardiol 2017;69:1172-87)

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NUTRITION AND CARDIOVASCULAR DISEASE

A heart-healthy diet has been the cornerstone of atherosclerotic cardiovascular disease (ASCVD) prevention and treatment for decades. Contemporary guidance by the American Heart Association/American College of Cardiology (AHA/ACC), the U.S. Department of Agriculture, and the Department of Health and Human Services is issued now as food-

based dietary patterns with accompanying specific nutrient recommendations (e.g., saturated fat, sodium) (1-5). The potential cardiovascular (CV) benefits of specific individual components of the "food-ome" (defined as the vast array of foods and their constituents) are still incompletely understood, and nutritional science continues to evolve. There are important challenges to establishing the scientific evidence base in nutrition, in part because of the

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complex interplay between nutrients and confounding by other healthy lifestyle behaviors associated with changes in dietary habits. However, in the meantime, several controversial dietary patterns, foods, and nutrients have received significant media exposure and are mired by hype. This review addresses some of the more popular food trends and dietary patterns that are promoted for CV health to provide clinicians with accurate information for patient discussions in the clinical setting.

CHALLENGES IN NUTRITION SCIENCE

Decades of research have significantly advanced our understanding of the role of diet in the prevention and treatment of ASCVD. The totality of evidence includes randomized controlled trials (RCTs), cohort studies, case-control studies, and case series/reports as well as systematic reviews and meta-analyses (6). Although a robust body of evidence from RCTs testing nutritional hypotheses is available, it is not feasible to obtain meaningful RCT data for all diet and health relationships. Studying preventive diet effects on ASCVD outcomes requires many years because atherosclerosis develops over decades and may be cost-prohibitive for RCTs (7). Most RCTs are of relatively short duration and have limited sample sizes. Dietary RCTs are also limited by frequent lack of blinding to the intervention and confounding resulting from imperfect diet control (replacing 1 nutrient or food with another affects other aspects of the diet). In addition, some diet and health relationships cannot be ethically evaluated (8). For example, it would be unethical to study the effects of certain nutrients (e.g., sodium, trans fat) on cardiovascular disease (CVD) morbidity and mortality because they increase major risk factors for CVD.

Epidemiological studies have suggested associations among diet, ASCVD risk factors, and ASCVD events. Prospective cohort studies yield the strongest observational evidence because the measurement of dietary exposure precedes the development of the disease (6). However, limitations of prospective observational studies include: imprecise exposure quantification; collinearity among dietary exposures (e.g., dietary fiber tracks with magnesium and B vitamins); consumer bias, whereby consumption of a food or food category may be associated with non-dietary practices that are difficult to control (e.g., stress, sleep quality); residual confounding (some nondietary risk factors are not measured); and effect modification (the dietary exposure varies according to individual/genetic characteristics). It is important

to highlight that many healthy nutrition behaviors occur with other healthy lifestyle behaviors (regular physical activity, adequate sleep, no smoking, among others), which may further confound results.

Case-control studies are inexpensive, relatively easy to do, and can provide important insight about an association between an exposure and an outcome. However, the major limitation is how the study population is selected or how retrospective data are collected (9). In nutrition studies that involve keeping a food diary or collecting food frequency information (i.e., recall or record), accurate memory and recording of food and nutrient intake over prolonged periods can be problematic and subject to error, especially before the diagnosis of disease. The advent of mobile technology and food diaries may provide opportunities to improve accuracy of recording dietary intake and may lead to more robust evidence.

Finally, nutrition science has been further complicated by the influences of funding from the private sector, which may have an influence on nutrition policies and practices (10).

HEALTHY DIETARY PATTERNS AND ASCVD RISK

Each year patients are bombarded with the publication of new “miracle” diet books that claim to promote health, effect weight loss, and reduce disease risks. Although the scientific evidence base for some of these diets is limited, there are several dietary patterns that have clearly been demonstrated to reduce the risk of many chronic diseases, including coronary heart disease (CHD). Clinicians must have an understanding of the specific common attributes of these healthy dietary patterns as a foundation for evaluating the health claims of new, widely hyped diets. Evidence-based healthy dietary patterns are high in fruits, vegetables, whole grains, legumes, and nuts in moderation, although some may include limited quantities of lean meats (including poultry and seafood), low-fat dairy products, and liquid vegetable oils (Table 1). These dietary patterns are also low in saturated, trans, and solid fats; sodium; added sugars; and refined grains.

The 2015 to 2020 Dietary Guidelines for Americans recommend 3 healthy eating patterns: 1) the Healthy U.S.-style Eating Pattern; 2) the Healthy

ABBREVIATIONS AND ACRONYMS

- ASCVD** = atherosclerotic cardiovascular disease
- BMI** = body mass index
- CD** = celiac disease
- CHD** = coronary heart disease
- CI** = confidence interval
- CV** = cardiovascular
- CVD** = cardiovascular disease
- GRD** = gluten-related disorder
- HDL-C** = high-density lipoprotein cholesterol
- HR** = hazard ratio
- LDL-C** = low-density lipoprotein cholesterol
- MI** = myocardial infarction
- MUFA** = monounsaturated fatty acids
- NCGS** = nonceliac gluten sensitivity
- NO** = nitric oxide
- PUFA** = polyunsaturated fatty acids
- RCT** = randomized controlled trial
- RR** = relative risk
- SFA** = saturated fatty acids
- T2DM** = type 2 diabetes mellitus
- VCO** = virgin coconut oil

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