Practice Paper of the Academy of Nutrition and Dietetics: Selecting Nutrient-Dense Foods for Good Health

ABSTRACT

The 2015 Dietary Guidelines for Americans encourage selection of nutrient-dense foods for health promotion and disease prevention and management. The purpose of this Academy of Nutrition and Dietetics practice paper is to provide an update regarding the science and practice of nutrient-dense food identification and selection. Characterization of tools used to identify nutrient density of foods is provided and recommendations for how registered dietitian nutritionists and nutrition and dietetics technicians, registered, might use available profiling tools to help consumers select nutrient-dense foods is discussed.
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RESEARCH SUGGESTS American diets are energy-rich and nutrient-poor.[1] Regular consumption of nutrient-dense foods for health promotion and disease prevention continues to be a mainstay of dietary recommendations provided by registered dietitian nutritionists (RDNs) and nutrition and dietetics technician, registered (NDTRs). Scientific and professional organizations such as the American Diabetes Association and the American Heart Association, whose memberships advocate optimal nutrition, prominently feature the concept of nutrient density in their dietary

guidance. The recently released 2015 Dietary Guidelines for Americans (DGA) recommend that individuals choose and consume a variety of nutrient-dense foods from among the basic food groups, including whole grains, low-fat milk, fruit, vegetables, lean meats and poultry, beans and peas, and nuts and seeds, prepared with little or no solid fats and added sugars, refined starches, and sodium.[2] This practice paper builds upon the 2007 nutrient density practice paper,[3] which introduced the concept of nutrient density and posed thoughtful questions and answers intended to bridge gaps between research and practice. The objective of this practice paper is to assist RDNs and NDTRs in guiding clients in making nutrient-dense food choices by summarizing the current knowledge regarding the science of nutrient density as it relates to individual foods, identifying consumer trends relevant to the selection and consumption of nutrient-dense foods, and describing nutrient-density profiling tools available to help consumers identify and choose nutrient-dense foods. Addressing nutrient-dense dietary patterns is not within the scope of this practice paper.

DEFINING NUTRIENT DENSITY

The core concept of nutrient density is the concentration of nutrients per amount of that food or caloric contribution of that food. The DGA definition of nutrient-dense foods are those that "provide vitamins, minerals, and other substances that contribute to adequate nutrient intakes or may have positive health effects, with little or no solid fats and added sugars, refined starches, and sodium."[2] Ideally, these foods and beverages also are in forms that retain naturally occurring components, such as dietary fiber. According to the DGA Executive Summary, "All vegetables, fruits, whole grains, seafood, eggs, beans and peas, unsalted nuts and seeds, fat-free and low-fat dairy products, and lean meats and poultry—when prepared with little or no added solid fats, sugars, refined starches, and sodium—are nutrient dense foods."[4]

Highly nutrient-dense dietary patterns are synonymous with higher consumption of whole grains, low-fat dairy, vegetables, and fruits[5]; that is, foods whose consistent intake has been associated with prevention of chronic disease.[6,7] In addition to a renewed focus on these foods, the DGA include practical suggestions for selecting these foods to optimize nutrient density of diets. Primarily, optimizing nutrient density is done by shifting typical food and beverage choices (items high in solid fats, added sugars, refined starches, or sodium) to more nutrient-dense options. Although the DGA recommend to focus on food first, fortified products

Tool	Description	Characteristics
NuVal Nutrition Scoring System (previously the Overall Nutritional Quality Index)[33]	Helps consumers understand the nutrient density of the food they purchase by generating a summative score based on presence or absence of >30 nutrients; uses Institute of Medicine Dietary Reference Intakes and the Dietary Guidelines for Americans; scores range from 1-100.	Scores correlate with health outcomes. Incorporates measures for quality of protein, fat, carbohydrates, calories, and n-3 fatty acid content and distinguishes between nutrients to encourage (eg, vitamins, minerals, and antioxidants) and nutrients to limit (eg, added sugar, sodium, *trans* fat, and cholesterol).
Nutrient Rich Foods Index[5]	This validated index is a sum of percent Daily Values for 9 nutrients to encourage minus the sum of percent daily value for 3 nutrients to limit with all Daily Values calculated per serving size.	Distinguishes between nutrients to encourage (eg, vitamins, minerals, and antioxidants) and nutrients to limit (eg, sugar, sodium, and saturated fat). Versatile across individual foods, total diet, and menus and allows calculation of nutritional value of food per unit cost.
Affordable Nutrition Index[34]	Scoring system based on the Nutrient Rich Foods Index that produces a nutritional value per dollar score to help consumers identify low-cost, nutritious foods.	Provides nutrition value per dollar tool that could help clients of federal food assistance programs (eg, WIC[a] and SNAP[b]), distinguishes between nutrients to encourage (eg, vitamins, minerals, and antioxidants) and nutrients to limit (eg, added sugar, sodium, and saturated fat).

[a]WIC=Special Supplemental Nutrition Program for Women, Infants, and Children.

[b]SNAP=Supplemental Nutrition Assistance Program.

Figure 1. Nutrient density profiling tools, United States.

and supplements may also be used to boost consumption of underconsumed, or shortfall, nutrients (eg, vitamin D, calcium, fiber, folate, vitamin E, and vitamin C) in certain instances when food alone may not be enough to meet needs.

ASSESSING NUTRIENT DENSITY OF FOODS

Nutrient density of a food can be characterized through its systematic ranking or classification based on nutrient composition.[5,8] Using established algorithms, the presence or absence of specific nutrients is noted and the food is assigned a score based on the a priori criteria. The resulting scoring system can be transformed into a practical tool to help consumers identify foods that appropriately balance essential nutrients, such as protein and mono- and polyunsaturated fats and dietary fiber, with overconsumed nutrients associated with poorer health outcomes, including added sugars, saturated fat, *trans* fat, and sodium.

Although no single nutrient-density profiling tool or system has been endorsed,[9] more than a dozen tools have been developed and pilot tested in the public sector.[10] Figures 1 and 2 provide a description of selected nutrient-density profiling tools available through retail grocery stores and some foodservice settings in the United States (Figure 1) and internationally (Figure 2) designed to provide consumers with point-of-purchase nutrient density guidance to help them choose among similar products.

RDNs and NDTRs should be mindful of several factors when recommending or using nutrient-density profiling tools to determine the nutrient density of individual foods. Firstly, all nutrient-density profiling tools generally consider both beneficial (and typically underconsumed) nutrients such as fiber and some vitamins and minerals, as well as those known to negatively influence health when consumed in excess (eg, added sugars, saturated fat, *trans* fat, and sodium); however, inclusion of these nutrients depends on the tool—some are more narrowly focused on several essential nutrients rather than the entire spectrum. In addition, some tools will highlight nutrients based on their known influence on important health outcomes. For example, scores in the NuVal system reflect what is known about relationships between saturated fatty acids, n-3 fatty acids, and cardiovascular disease, and promote n-3 fatty acids as beneficial for cardiovascular disease prevention. Finally, systems for evaluating the nutrient density of individual foods use different methods to present critical information. For instance, the Guiding Stars program assigns foods between one and three stars indicating nutrient density (0=Not rated, or lowest levels