Sustainable Nutrition: Where do dietary patterns and nutrient quality fit in?

The *National Geographic* series “EAT: The New Food Revolution” showcases the challenge of feeding 9 billion people around the global dinner table by 2050. Sustainability often focuses on adequate calories and food production. However, in an interesting play on words, the series also reminds viewers that food sustains them. It is time to consider the many aspects of sustainable nutrition, from nutrient density of foods to the economic and social aspects of food choice that include cultural norms, preferences and consumer behavior (taste, cost and convenience). This issue of *Health Connections* discusses how health professionals can put sustainable nutrition in context in order to help consumers create and adopt food patterns that are nutritious, good for the planet and include all food groups.

**Research Update**

Descriptions of very complex, interrelated food systems often focus on the production, processing, packaging and distribution functions to assure a safe and sufficient food supply (see *Sustainability: Maintaining a healthy planet, people, products and profits*). Farm to fork and other local buying programs are meant to minimize the impact of food processing and transport on the environment. Given rising concerns about climate change, the loss of biodiversity and overuse of natural resources, the overall sustainability of food production has been equated with its impact on the environment. For that reason, the carbon footprint of foods, measured primarily by greenhouse gas emissions (GHGE) per kg of food product, has captured the public interest. In the sustainable nutrition security model, nutrient density of foods and the social and economic components of food choice are equally important. New metrics to assess components of nutrition sustainability such as the Nutrient Density of Climate Impact index are under development.

Environmental impact is one component of food sustainability that needs to be considered in a holistic manner to incorporate the many dimensions involved. Sustainable nutrition recognizes the interdependencies of food production systems, scientifically-based food and nutrient requirements and nutrients needed most for optimal health—not only globally but at the community and individual levels. Producing enough food to meet consumer demand is necessary but not sufficient if consumers are to achieve the level of nutrients needed for full health benefits.

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**HEALTH CONNECTIONS EDITOR**

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Too Little, Too Much or Just the Right Amount?

Most consumers can be described as falling into one of the following categories depending on the quantity of food eaten and quality of their food choices:

- Calorie and nutrient insufficient (food insecure)
- Calorie sufficient but nutrient insufficient
- Calorie and nutrient sufficient
- Calorie oversufficient but nutrient insufficient (the overfed but undernourished).

A wide range of additional factors further influence the particular foods and nutrients actually consumed and thus can place constraints on food choice and diversity. These include preference, affordability, cooking skill, level of and access to information on health/nutrition, culture and tradition.

The 2015 Dietary Guidelines Advisory Committee’s continued emphasis on potassium, calcium, fiber and vitamin D as nutrients of concern and health consequences of their inadequate intake during the life cycle underscores the need that the food supply be sufficient in quantity, high in nutrient quality and supportive of the social and cultural aspects of diverse dietary patterns. Although there is some debate over whether the committee’s charge extends beyond nutrition to sustainability, the 2015 sustainable diets framework placed health at the intersection of food patterns/intakes, food security and food sustainability.

International studies—many using a modeling approach—suggest that, in general, intake of animal-based foods was associated with a greater environmental impact (see next section and interview). However, as the literature also notes, and the committee maintained in its draft conclusion statement, an environmentally sustainable diet can be achieved without excluding any food group completely and, in fact, is important for nutrient adequacy.

Sidebar

Feed People, Not Landfills: The impact of food waste on food security and the environment

- It is estimated that about 31 percent of food available at consumer and retail levels in the United States is wasted. The infographic further describes the loss in pounds, retail value and calories.
- Food waste has associated environmental concerns in the loss of water, energy and other resources invested in production.
- An estimated 50 million Americans do not have access to enough food. Organizations can donate safe and healthy food to food banks or food rescue organizations and both reduce food sent to landfills and feed those in need.

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Has the concept of sustainable diets changed over the past few years?

It is important to remember that the definition of sustainable diets developed by the Food and Agriculture Organization of the United Nations does include the protection of natural resources as well as diet quality and health. Whereas the carbon footprint of agricultural production is an important concept, we need to think whether what is best for us is also best for the planet and vice versa. Studies from multiple countries have now shown that some foods with low environmental impact also have minimal nutritional value. By contrast, the United States’ current dietary guideline to consume 3 servings of fish per week is incompatible with the worldwide destruction of fisheries. We will need to balance land, water and energy use with nutritional requirements and with good health.

Recent studies have calculated the carbon cost of alternative diets. Right now we do not have complete information to do the same with the water footprint or with land use change. Interestingly, the more nutrient-rich diets—those with meat, dairy, vegetables and fruits—were associated with higher GHGE than were diets of lower nutritional value. Identifying those food groups that have high quality diets at low environmental cost will be a priority area for research.

This suggests that what consumers currently select can be sustainable with minor adjustments rather than a major restructure. A key finding was that a principal way to lower the dietary carbon footprint of existing food patterns was to simply eat less—particularly of low-nutrient foods/beverages.

Health professionals can encourage consumers to gradually enhance their current dietary patterns by stepwise substitution of more nutrient-rich foods to replace nutrient-poor foods. Eating less overall can help address obesity, and emphasizing more nutrient-rich foods helps address micronutrient deficiencies in the undernourished—and can improve consumers’ nutrient quality whatever their food and nutrition security category.

Interview

Adam Drewnowski, PhD, Director, Center for Public Health Nutrition, University of Washington, Seattle

How can health professionals break down the seemingly overwhelming concept of sustainable diets for clients/consumers?

Truly sustainable diets provide optimal and affordable nutrition to consumers while doing minimum damage to natural resources. We are still learning what the various trade-offs are. What we do know is that nutrient density of foods and the quality of food patterns need to figure heavily in our discussions of sustainability.

What is the current state of research efforts to calculate carbon costs per nutrient?

We have previously developed value metrics to show that certain food groups deliver the most nutrients per penny. Dairy products are the lowest cost source of dietary calcium, by far, whereas potassium is best sourced from potatoes and beans. We are now using the same methods to assess the carbon footprint associated with selected key nutrients in the food supply; for example, high-quality protein may not be so easy to get.
Sustainability: Tips for Consumers

1. Encourage clients to improve their carbon footprint by losing weight or maintaining a healthy weight and by minimizing food waste.

2. Emphasize that dietary patterns can be both sustainable and healthy without excluding any food group. Sustainability does not equal organic, nor does it require that consumers eat only plant-based foods. The volume of food needed to meet both calorie and nutrient requirements needs to be considered.

3. Customize messages based on where clients fit into the different nutrition security categories—one size doesn’t fit all when discussing sustainable diets.

4. Remember that minimally-processed foods can have greatly extended shelf life, enhanced nutrition and improved access, thus reducing waste and improving overall sustainability.

5. Relate to consumers' understanding of sustainability. The majority of Americans view agriculture positively, with 7 in 10 agreeing it can be sustainable and produce nutritious, high-quality foods.

6. Become familiar with the aspects of sustainability most important to Americans. These include:
   • Conserving the natural habitat.
   • Ensuring an affordable food supply.
   • Ensuring a sufficient food supply for the growing global population.

7. Educate consumers about biotechnology’s role in agriculture as consumers are more accepting when aware of the benefits for themselves and their families. Consumers are most trusting of health organizations, government agencies and health professionals—not journalists, bloggers or celebrities—for information regarding food biotechnology.

8. Remember that millennials have a big influence over sustainability in food production, are more favorable toward food biotechnology and are willing to pay more for sustainable foods and beverages compared to other age groups.

9. Recognize that the global population explosion will require a shift in priorities related to food production. Feeding the world will require exploring a wide range of options and resources to maximize the production of adequate amounts of nutrient-rich foods.