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Healthy People, Healthy Planet: A Flexitarian Approach to Sustainable Healthy Diets
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Our eating habits affect not only our personal health but the health of the planet as well. Concerns about health, environmental sustainability, and animal welfare are all reasons why individuals are turning towards more plant-based eating, including flexitarian diets.[1,2] In 2019, the EAT-***Lancet*** Commission concluded that "[t]he global adoption of healthy diets from sustainable food systems would safeguard our planet and improve the health of billions."[3] Furthermore, international health and sustainability goals including the United Nations (UN) Sustainable Development Goals and Paris Agreement on climate change are linked to diets and the global food system.[3-5]

Sustainable healthy diets "are dietary patterns that promote all dimensions of individuals' health and well-being; have low environmental pressure and impact; are accessible, affordable, safe and equitable; and are culturally acceptable."6 According to the 2019 Intergovernmental Panel on Climate Change, "[c]onsumption of healthy and sustainable diets presents major opportunities for reducing GHG [greenhouse gas] emissions from food systems and improving health." Healthy and sustainable diets are high in coarse grains, pulses (eg, lentils, dry beans, dry peas, chickpeas), fruits and vegetables, and nuts and seeds, and low in energy-intensive animal-sourced foods (eg, beef and pork) and discretionary foods (such as sugary beverages).[7]

This continuing education course provides an overview of the EAT-***Lancet*** Commission's planetary health diet, a largely plant-based flexitarian diet; discusses the principles of a flexitarian diet; describes the nutritional advantages of a flexitarian diet; examines the health and environmental benefits of a flexitarian diet; and provides strategies RDNs can use when counseling their clients on implementing a flexitarian diet.

The Planetary Health Diet: A Largely Plant-Based Flexitarian Diet
In 2019, the EAT-***Lancet*** Commission on Healthy Diets From Sustainable Food Systems brought together 37 leading scientists from 16 different countries to answer the question: "Can we feed a population of 10 billion people a healthy diet within safe planetary boundaries for food production by 2050?"[3] Their answer was "yes," but not without widespread, multisector action, including major improvements in food production practices, large reductions in food loss and waste, and a substantial global shift toward healthy dietary patterns.[3,4]

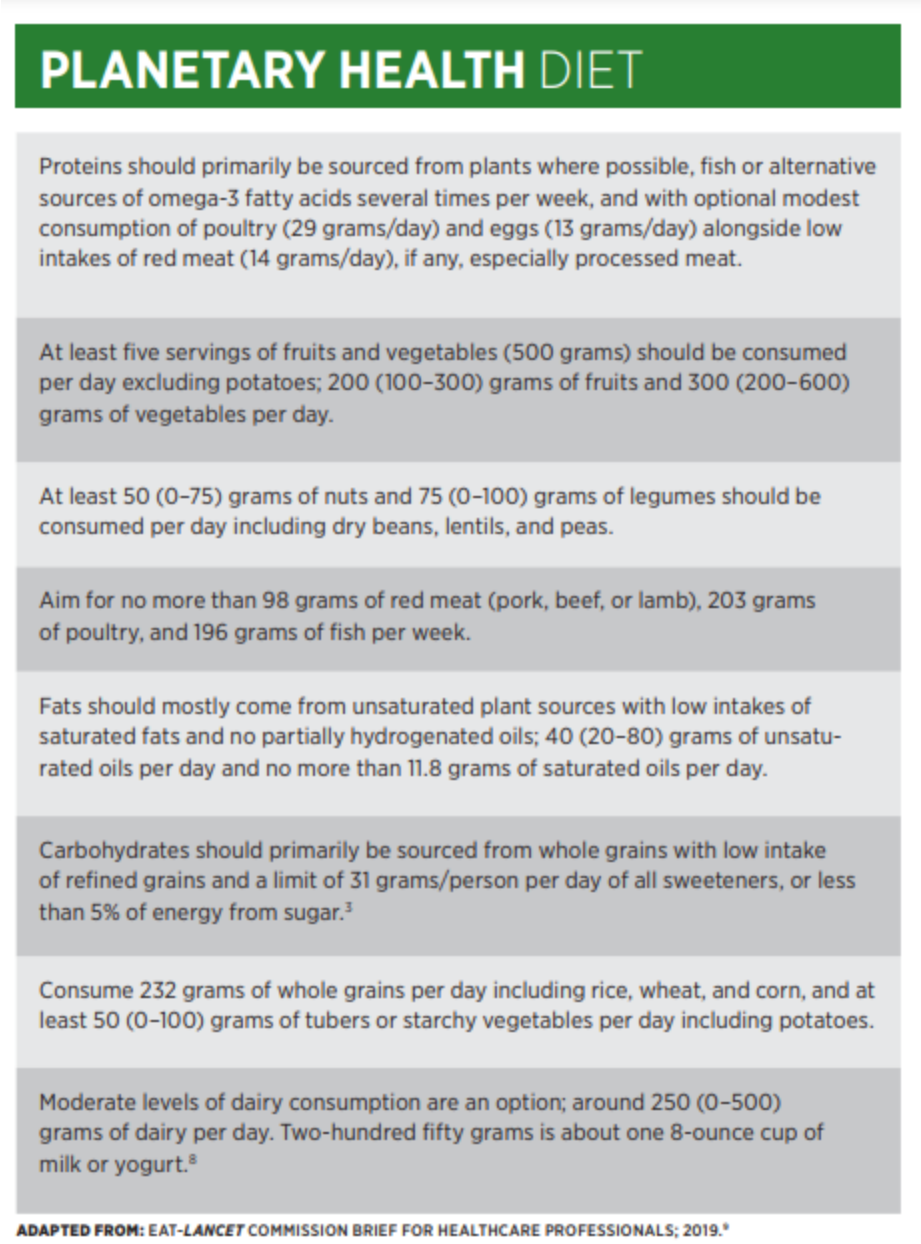
The Commission developed a healthy reference diet or planetary health diet based on global scientific targets for a healthy diet from a sustainable food production system that operates within planetary boundaries for food, including climate change, land-use change, freshwater

use, nitrogen recycling, phosphorus recycling, and biodiversity loss. Each planetary boundary represents a system or process that is important for regulating and maintaining the stability of Earth.[3,4]

As noted by the Commission, "[t]ransformation to healthy diets by 2050 will require substantial dietary shifts," including a greater than 50% reduction in global consumption of red meat and sugar (primarily by reducing consumption in wealthier countries), and a greater than 100% increase in consumption of nuts, fruits, vegetables, and legumes. However, because "some populations depend on agro-pastoral livelihoods and animal protein from livestock and many populations continue to face burdens of undernutrition,"[3] the role of animal-sourced foods in people's diets must be considered in each context and within local and regional realities.[3,4]

The planetary health diet is a "flexitarian diet, which is largely plant-based but can optionally include modest amounts of fish, meat, and dairy."[3] It is meant to be flexible and can be adapted to local and regional contexts, culinary/cultural traditions, and personal dietary preferences. It recommends consuming a range of foods that amount to 2,500 calories a day to promote human health.[3,4] Of course, the optimal energy intake needed to maintain a healthy weight will vary depending on a person's age, height and weight, and physical activity level.[4]

The planetary health diet outlines empirical food groups and ranges of food intake, which when consumed as a diet optimizes human health (see table).[3,4,8,9] Seeing specific foods included in grams per day may be unfamiliar, including 13 grams per day of eggs, when one large egg is about 50 grams. Hence, it may be easier to think about consumption of certain foods, such as eggs, on a weekly basis (1.5 to two eggs per week).[4,10] The same applies to other animal protein foods including red meat, poultry, and fish.[10] The table below outlines weekly intake recommendations for these food items.



What does a planetary health plate look like? By volume, approximately half of the plate should consist of fruits and vegetables, while the other half should consist of primarily whole grains, plant-sourced protein (eg, beans, lentils, peas, nuts, and soy foods such as tofu and tempeh), unsaturated plant oils, modest amounts of animal-sourced protein foods and dairy and limited amounts of added sugars and starchy vegetables (see figure below).[3,4] The Harvard T.H. Chan School of Public Health, The Nutrition Source provides a sample seven-day planetary health diet meal plan.[10]

There have been criticisms of the planetary health diet including the potential to devastate the animal-husbandry industry and that it is too expensive for many consumers.[11] One analysis estimated that the planetary health diet would be unaffordable for at least 1.58 billion people, mostly in sub-Saharan Africa and South Asia. Based on these findings, the authors concluded that "[m]easures to alleviate price and income constraints will be essential to bringing healthy and sustainable diets within reach of the world's poor."[12]

Flexitarian Diet Basics

"Flexitarian" is a combination of the words "flexible" and "vegetarian." It refers to an individual who follows a primarily but not strictly vegetarian diet, occasionally eating red meat, poultry, or fish and seafood.[13,14] A flexitarian diet is sometimes referred to as a semivegetarian diet.[14] It encourages variety rather than restriction, as individuals do not have to exclude any specific food.[15] The EAT-***Lancet*** Commission notes that a flexitarian diet is "largely plant-based but can optionally include modest amounts of fish, meat, and dairy foods."[3,4]

A flexitarian diet is plant-rich and based on the following principles: emphasize fruits, vegetables, and whole grains; focus on plant-based sources of protein (eg, legumes, nuts, and seeds); include dairy products and eggs (in moderation); incorporate poultry, fish and seafood, and red meat occasionally; and minimize consumption of processed meats (eg, bacon), refined grains and grain products, processed snack foods, fast food, and added sugars.[16,17] The

principles of a flexitarian diet are aligned with the 2020–2025 Dietary Guidelines for Americans, as both emphasize fruits, vegetables, whole grains, dairy, and a broad range of protein sources, including beans, lentils, and peas; nuts, seeds, and soy products; fish and seafood; and lean meat, poultry, and eggs.[18,19] However, some experts have expressed concern that dietary targets for the Healthy U.S.-Style Dietary Pattern within the Dietary Guidelines for Americans emphasize a diet that is relatively high in animal-sourced foods such as meat, eggs, and dairy foods.[20]

Nutritional Advantages of a Flexitarian Diet

In a flexitarian diet, the large quantity of plant-based foods, along with a moderate intake of dairy products and low amounts of red meat, saturated fat, and added sugars generally provide an all-around healthy mix of high-quality protein, dietary fiber, vitamins, minerals, and unsaturated fatty acids.[15] Dairy foods, included as part of a flexitarian diet, provide numerous nutrients including calcium, phosphorus, vitamin A, vitamin D (in products fortified with vitamin D), riboflavin, vitamin B_{12}, potassium, zinc, choline, magnesium, selenium, and iodine.[15,21] For individuals who choose dairy alternatives, fortified soymilk and soymilk yogurt alternative—which have calcium, vitamin A, and vitamin D added—can be consumed as part of the dairy group, as their nutritional content is similar to dairy milk and yogurt.[21]

By consuming more nutrient-dense foods and beverages, such as vegetables, fruits, whole grains, nonfat and low-fat dairy products, and fortified soymilks, individuals can increase their intake of dietary components of public health concern, including calcium, potassium, dietary fiber, and vitamin D.[22]

Health Benefits of a Flexitarian Diet

Rapid urbanization and rising incomes are driving a global dietary transition in which traditional diets high in plant-based foods are being replaced with a Western-style dietary pattern, which is high in saturated fat, added sugar, and animal protein, and low in dietary fiber.[23] It is characterized by a high intake of calories, highly processed foods (including ultraprocessed foods), refined grains and starch (potatoes), processed and red meats, high-fat dairy products, and desserts and sweets.[10,23,24] Fruits and vegetables, whole grains, legumes, and fish and seafood are generally underconsumed.[24] This Western-style dietary pattern is associated with obesity and related metabolic diseases.[25]

A review of the evidence-based literature published in 2017 concluded that a flexitarian diet provides emerging benefits for weight management including lower body weight and BMI and improved metabolic health, including lower blood pressure and blood glucose.[14] More recently, in 2020, a study of 10,797 individuals published in the ***British Journal of Nutrition*** found that flexitarians had a significantly lower BMI and lower blood pressure than omnivores.[26]

In the U.S., atmospheric fine particulate matter (PM2.5) (ie, air pollution) from anthropogenic sources (ie, due to human activity) is responsible for approximately 100,000 premature deaths each year. Of these premature deaths, one-fifth are linked to agriculture.[27-29] Chronic exposure to PM2.5 increases the incidence of premature mortality from chronic disease (eg, cardiovascular disease). Nationwide dietary shifts that increase consumption of plant-based foods while maintaining protein intake and other nutritional needs could reduce agricultural air

quality-related mortality, according to a study published in 2021.[27] In this study, the authors evaluated the emission of pollutants from food production that contribute to PM2.5. These pollutants include directly emitted PM2.5 (primary PM2.5) and PM2.5 formed in the atmosphere (secondary PM2.5) from the precursors ammonia (NH_3), nitrogen oxides, sulfur dioxide (SO_2), and nonmethane volatile organic compounds.[27] These authors found that by shifting to a flexitarian diet (ie, the EAT-***Lancet*** Commission's largely plant-based flexitarian diet), 10,700 deaths could be prevented per year, or a 68% reduction in agricultural air quality-related mortality.[27] Air pollution from food production also jeopardizes achievement of the UN Sustainable Development Goal 3 (ensure healthy lives and promote well-being for all at all ages).[5]

Environmental Benefits of a Flexitarian Diet

The global food system is a major contributor to climate change, land-use change and biodiversity loss, depletion of freshwater resources, and pollution of aquatic and terrestrial ecosystems from synthetic fertilizer and manure application.[30] In the absence of concerted action, environmental impacts of the food system are expected to increase in the next 30 years because of population growth and a global transition to diets that are high in calories and contain larger quantities of animal-source foods, ie, Western-style diets.[5,30-32]

Meat from ruminant animals, such as beef, has the largest environmental impact for most environmental indicators such as greenhouse gas emissions, land use, and energy use.[5,33] "While there can be large variation around the mean environmental impact of any given food, the lowest impact animal-source food typically has higher environmental impacts than the highest impact plant-based food."[5]

Three separate studies published in 2021 estimated that the global food system is responsible for 33% to 35% of global greenhouse gas emissions,[34-36] which threatens global temperature targets in the Paris Agreement on climate change and achievement of UN Sustainable Development Goal 13 (take urgent action to combat climate change and its impacts).[5] Dietary choices play a significant role in determining the amount of heat-trapping (greenhouse) gases that are emitted from the food system.[36] In general, CO_2-equivalent (greenhouse gas) emissions from plant-based foods are 10 to 50 times lower than most animal-sourced foods, per kilogram. Beef generates the highest emissions of heat-trapping gases per kilogram of commodity produced.[33,37]

In a study published in 2020, researchers concluded that extensive changes to the global food system, including adoption of plant-rich diets (eg, the EAT-***Lancet*** Commission's largely plant-based flexitarian diet), will likely be needed to limit global warming and meet the 1.5˚ and 2˚ C temperature targets in the Paris Agreement on climate change.[38] Other researchers found that adopting more plant-based flexitarian diets globally could reduce greenhouse gas emissions by more than half, and reduce other environmental impacts as well, including nitrogen application.[31,32] "[C]hanges in cropland use, freshwater use, and phosphorus application were split into reductions in high-income and middle-income countries and increases in low-income countries."[32]

How to Implement a Flexitarian Diet

To get started implementing a flexitarian diet, clients and patients can use the following strategies as a guide:[13,16]

1. Start small. Commit to one meat-free day per week, such as "Meatless Monday," or two meatless days per week. Then, adjust your diet over time. Also, focus on making meals with smaller portions of meat, such as a stir-fry.
2. Make plant-based substitutions. Substitute the meat in your meals for a plant-based source of protein, such as lentils and beans. For example, make a Bolognese sauce with brown lentils or prepare stews with beans or lentils in place of meat. Alternatively, use a 50/50 approach by substituting half the meat content of a recipe with a plant-based food (eg, 50/50 mushroom-beef burger). This allows for a reduction in meat intake while enabling clients to savor flavors and textures they enjoy.
3. Make the most of plant-based meat-alternatives such as plant-based veggie burgers, tofu, and tempeh.
4. Take inspiration from cuisines that traditionally use lentils and beans and bring out their flavor with herbs and spices, eg, an Indian dal or curry or a Mediterranean stew.
5. Incorporate other nutrient-dense foods, such as dairy foods, into plant-based recipes. For example, add a dollop of plain yogurt to a lentil-vegetable curry.
6. Prepare large batches of your favorite plant-based recipes. Freeze the leftovers or save them for the next day's lunch.
7. If your clients feel held back by their limited cooking skills, suggest they take a vegetarian or vegan cooking class. Doing so will increase their culinary confidence and ability to prepare plant-based recipes.
8. Plan the next week's meals. This will minimize food waste and save time and money.

Take Home Messages

Healthy diets from sustainable food systems are needed to feed a projected 10 billion people by 2050. Major changes, including dietary changes, are necessary to build a more sustainable food system. These changes are outlined in the EAT-***Lancet*** Commission's planetary health diet, which is a largely plant-based flexitarian diet that optionally allows for modest consumption of fish, meat, and dairy.

In a flexitarian diet, the large quantity of plant-based foods along with a moderate intake of dairy products, and low amounts of red meat, saturated fat, and added sugars provide high-quality protein, fiber, vitamins, minerals, and unsaturated fatty acids. Evidence suggests that a flexitarian diet may provide benefits for weight management including lower body weight and BMI, and for metabolic health, including lower blood glucose, and blood pressure. It may also reduce agricultural air-quality mortality.

Adopting flexitarian diets globally could also reduce environmental impacts associated with the food system, including a reduction in greenhouse gas emissions and other environmental impacts, including nitrogen application. A flexitarian diet is an example of a sustainable healthy dietary pattern. Dietitians can work with clients to implement flexitarian diets.

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Quiz

1. Which of the following practices are components of the planetary health diet?
A. Low intake of whole grains and high intake of fish
B. High intake of fish and modest intake of dairy foods
C. Low intake of plant-based foods and high intake of meat
D. High intake of plant-based foods and modest intake of dairy foods

2. Which of the following environmental benefits is associated with the flexitarian diet?
A. Reduced greenhouse gas emissions
B. Increased use of nitrogen application
C. Reduced freshwater use in low-income countries
D. Increased cropland in high- and middle-income countries

3. Potential health benefits of the flexitarian diet include:
A. Lower blood pressure and lower body weight and BMI.
B. Stabilized blood glucose levels and lower blood pressure.
C. Lower body weight and BMI and increased blood pressure.
D. Stabilized body weight and BMI and increased blood glucose levels.

4. Which of the following strategies is suggested for implementing a flexitarian diet?
A. Eat out more frequently.
B. Commit to eating a meat-free diet.
C. Avoid plant-based meat alternatives.
D. Substitute beans for some meat in recipes.

5. Based on a study reviewed in this article, shifting to a flexitarian diet could reduce agricultural air quality–related mortality by:
A. 28%
B. 48%
C. 68%
D. 88%

6. Which nutrients of public health concern are provided by dairy foods and fortified soymilk in a flexitarian diet?
A. Calcium, vitamin D, and potassium
B Dietary fiber, calcium, and selenium
C. Potassium, vitamin A, and phosphorus
D. Choline, calcium, and dietary fiber