

THE FOOD PYRAMID AND DISEASE PREVENTION

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The United States has its first new food pyramid since 1992. Named “MyPyramid,” it was designed in accordance with the *US Dietary Guidelines for Americans* and jointly published in April 2005 by the US Department of Health and Human Services (HHS) and the US Department of Agriculture (USDA). These guidelines are “the cornerstone of federal nutrition policy and education” and are based on “what experts have determined to be the best scientific knowledge about diet, physical activity and other issues related to what [Americans] should eat and how much physical activity [they] need.”¹ For its part, MyPyramid was created solely by the USDA and reflects the agency’s attempt to present the *Dietary Guidelines* in a consumer-friendly form with the hope of encouraging people to be healthier by personally applying science “to their own lives.”¹

Intended for people 2 or more years old, the new

pyramid has a significant impact on clinicians, educators, and policymakers, as federal law requires that the *Dietary Guidelines* be “promoted by each Federal agency in carrying out any Federal (sic) food, nutrition, or health program.”² This includes menu planning in the National School Lunch Program; inclusion in educational materials presented by the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC); and usage by many other federal programs.²

Interestingly, the image for the new food pyramid has no recognizable connection to the old one (see Figure 1). Although MyPyramid recommends similar proportions of food, such as 2 to 3 servings of fruits per day, gone is the hierarchical representation of the relative proportions and specific recommendations of food groups found in the 1992 USDA Food Pyramid (Figure 2). Instead, the MyPyramid image is a multicolor, three-

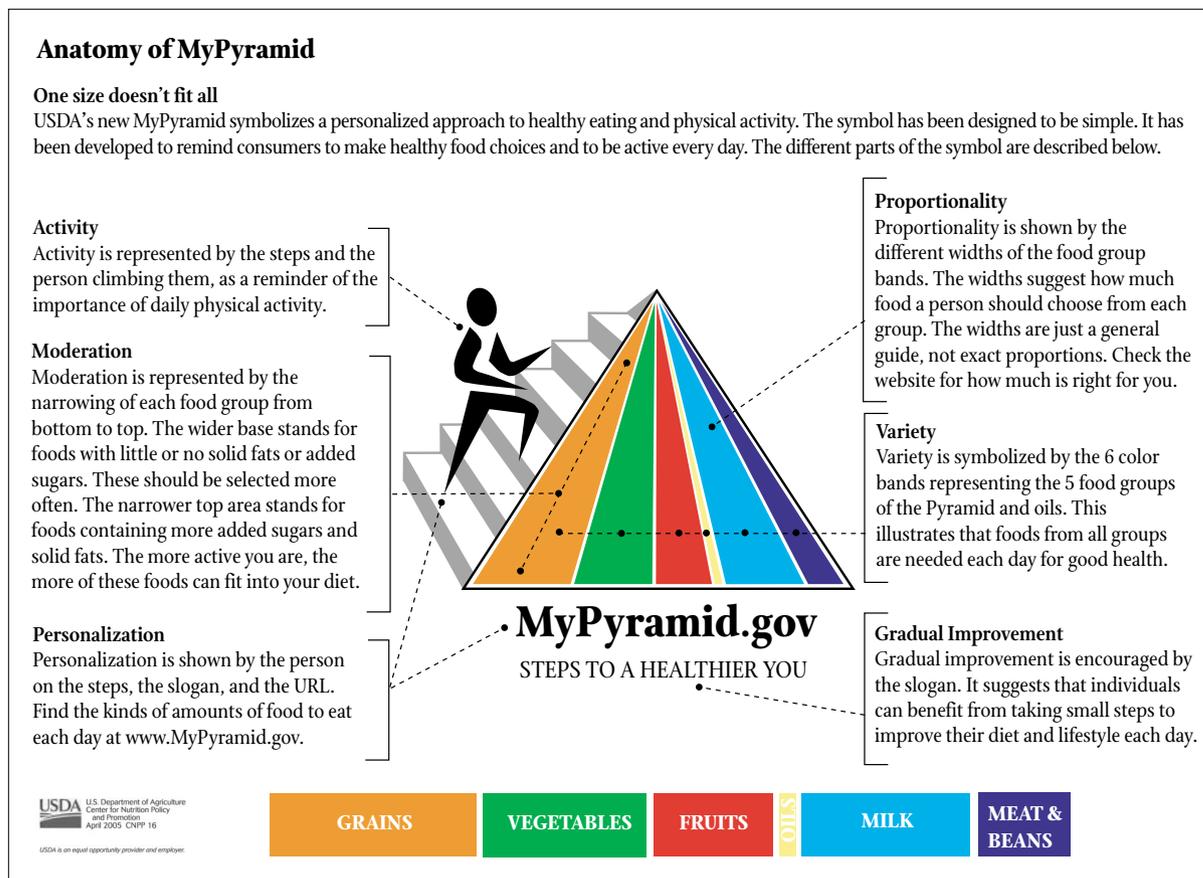


FIGURE 1
THE NEW FOOD PYRAMID ATTEMPTS TO IMPROVE HEALTH THROUGH A MORE INDIVIDUALIZED APPROACH TO DIET

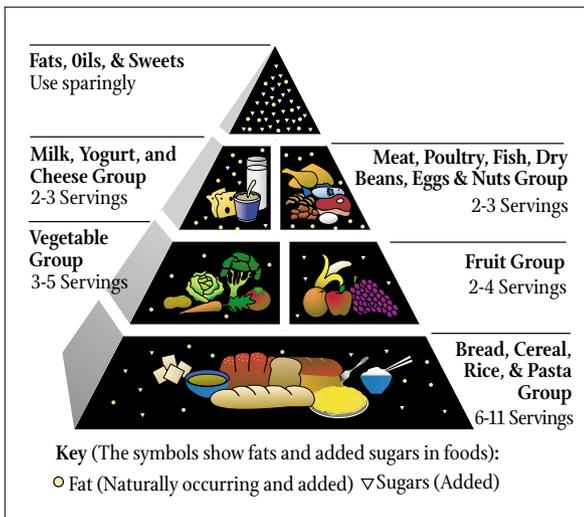


FIGURE 2
1992 FOOD PYRAMID

dimensional representation of the USDA's idea of a healthy diet and lifestyle. The concepts designed into the MyPyramid icon are variety, moderation, proportionality, activity, gradual improvement, and personalization.³ Six different colors arranged in vertical wedges represent the USDA's food groups—orange for grains, green for vegetables, red for fruit, yellow for oils, blue for milk, and purple for meat and beans—and indicate variety. Additionally, MyPyramid contains a "discretionary calories" category, which is not represented on the pyramid, that allows people to eat a limited amount of whatever food they want. The narrowing of each vertical food group from bottom to top of the pyramid represents moderation, and their relative wedge widths suggest how much food a person should consume from each group, demonstrating proportionality. The steps on the side of the pyramid and the person climbing them represent activity, and the slogan, "Steps to a Healthier You," is intended to encourage gradual improvement. The cartoon figure on the steps, the slogan, and the web address imply personalization.

In an April 19 press release unveiling the \$2.4 million campaign,⁴ USDA Secretary Mike Johanns said, "MyPyramid is about the ability of Americans to personalize their approach when choosing a healthier lifestyle that balances nutrition and exercise."⁵ MyPyramid's central message is "to help Americans live longer, better, and healthier lives."⁵ Indeed, MyPyramid does offer improvements over the old pyramid; however, some of its recommendations contribute to the development of coronary heart disease (CHD) and prostate cancer—with the latter potentially affecting a disproportionate number of black men.

INSIDE THE PYRAMID

What makes MyPyramid so personal—and thus, theoretically, personally applicable? The MyPyramid

campaign incorporates various multimedia educational strategies, including extensive print and online materials. Central to the campaign is a web-based tool, available at www.mypyramid.gov. When a person enters his age, sex, and activity level into the online form and clicks "Submit," a personalized MyPyramid Plan appears. This plan lists the recommended number of daily servings for 5 food categories—grains, vegetables, fruits, milk, and meat and beans—along with recommendations for oils and "discretionary calories." It then further delineates the amounts of whole grains and vegetables that should be in the diet, including weekly servings of dark green, orange, and starchy vegetables.

This tool is intended to provide a quick dietary overview. For a more detailed assessment of a person's diet and physical activity, someone can click the MyPyramid Tracker link (www.mypyramidtracker.gov). Here, again, the person must enter basic health stats, then also must enter all the foods eaten and physical activities undertaken in the past 24 hours. Based on this information, MyPyramid Tracker provides most of the same information as MyPyramid, but adds individual recommendations for total fat, saturated fat, cholesterol, and sodium consumption. (Oddly enough at press time, this site, unlike the MyPyramid site, did not list optimal amounts for oils and discretionary calories.) Beyond this, MyPyramid Tracker will evaluate a person's diet with regard to the recommended daily intake (RDI) of nutrients and percentage of omega-3 and omega-6 fatty acids. It can also compare that diet to the person's web-generated dietary recommendations, indicating whether the number of servings the diet provides in each food category is in accordance with the MyPyramid recommendations. This can be very helpful to people who are trying to understand how their diets measure up against the USDA's dietary advice.

All of these features may be great for people with Internet access, but most Americans will not benefit from this online resource. The US Census Bureau estimated that 58.5% of US households lacked Internet access in the year 2000.⁶ Among families whose income was less than \$28,000 per year, only 19% had Internet access.⁶ These are the families most likely to be taking part in the government-assistance programs that are federally mandated to provide food based on MyPyramid guidelines. Undoubtedly, these household numbers have changed since 2000, but the number of people who are without Internet access likely remains high. Although most public libraries offer free internet access, it seems quite unlikely that a person would bother to perform the time-consuming task entering the MyPyramid Tracker data requires. Thus, the USDA's heavy reliance on technology to deliver its message leaves many, if not the majority, of citizens without access to these online resources.

PERSONALIZED RECOMMENDATIONS

To determine whether MyPyramid is practical and promotes health, I generated a personalized set of recommendations at the MyPyramid website. The suggestions for me, a 38-year-old male who exercises an average of 30-60 minutes per day, are listed in Table 1.

In an attempt to implement these recommendations, I decided to enter a day's worth of meals on the MyPyramid Tracker site. However, instead of replicating my normal diet, I imagined what meals an "average" person who is trying to eat a healthful diet might eat (Table 2).

I created my menu with macronutrient proportions similar to those provided on a sample menu on the MyPyramid website.⁷ In looking at the resulting menu, it seems implausible that I could have met the MyPyramid dietary recommendations provided in Table 1. But I generally did—despite that the only vegetables for the day came in the McDonald's Side Salad I had for lunch and the canned peas and carrots for dinner. A comparison of the MyPyramid food plan and my menu shows grains at 8 oz (half should be whole grains) vs 11 oz; vegetables, 3.5 cups vs 3.7 cups; fruits, 2 cups vs 2.1 cups; milk, 3 cups, vs a few ounces less than 3 cups; meat and beans, 6.5 oz, vs only 5 oz.

According to data gathered from the MyPyramid Tracker database, my menu items would provide 2,000 calories and 214 mg cholesterol (less than 300 mg was recommended). Although the MyPyramid Tracker database does not provide data on trans fatty acid content in foods (a serious drawback of the system), the USDA National Nutrient Database for Standard Reference does for some foods.⁷ According to this database, my menu contained more than 2.46 g of trans fatty acids, or 5.4% of my total daily fat intake of 45.5 g—an amount that is, as later explained, a serious health concern. Additionally, the amount of trans fatty acids in my diet as estimated by the USDA Database is most likely an underestimate, because trans fat was not listed for fried beefsteak, which probably contains significant amounts because it is fried. Regardless, according to the MyPyramid Tracker, I was well within my recommended fat consumption. As a percentage of total calories, total and saturated fats were 22% (20 to 35% was recommended) and 8% (less than 10% was recommended), respectively. As a general comparison between my menu and the USDA's sample menu, approximately 18.4% of my calories came from protein vs the USDA's 20%; 61% from carbohydrates vs the USDA's 53%; and 22% from total fat vs the USDA's 30%.¹

In addition to these gross calculations, I used the MyPyramid Tracker database to determine nutrient content of the foods. For someone who is trying to understand the nutritional content of his or her diet, this is an excellent resource. It was easy to navigate and use. However, many common items are not found in the database, which makes this tool less functional. For example,

TABLE 1

MYPYRAMID FOOD PLAN FOR A 38-YEAR-OLD MALE WHO EXERCISES AN AVERAGE OF 30-60 MINUTES PER DAY.

Food group	Recommendation (per day)
Grains	9 oz. (half should be whole grains)
Vegetables	3.5 cups
Fruits	2 cups
Milk	3 cups
Meat and beans	6.5 oz.
Oil	8 tsp.
Discretionary	410 calories (extra fats and sugars)
Total daily calories	2,600

TABLE 2

SAMPLE MENU THAT MEETS THE MYPYRAMID RECOMMENDATIONS FOR HEALTHY EATING FOR A 38-YEAR-OLD MALE WHO EXERCISES AN AVERAGE OF 30-60 MINUTES PER DAY.*

<p>Breakfast Bagel with fruit other than raisins, 1 large (3.5" to 3.75" diameter) Orange juice, 1.5 cup</p>
<p>Snack Black beans, cooked, no fat added, 1 cup Rice, brown, medium-grain, cooked, .5 cup Bread, multigrain, toasted, 2 large slices</p>
<p>Lunch McDonald's garden salad French fries, from frozen, deep-fried, 1 small fast-food order Milk, 1%, 1 cup</p>
<p>Snack Apple, fresh, small (2.5" diameter)</p>
<p>Dinner Beef steak, fried, 0.5 small steak Rice, brown, medium-grain, cooked, .5 cup Peas and carrots, canned, low sodium, no fat added, .5 cup Milk, lowfat, 1.33 cup Rice pudding, 0.5 cup</p>
<p>*Menu items are Listed as They Appear in the MyPyramid Tracker database of Foods.</p>

McDonald's Chicken McNuggets are not in the database, although they are in the USDA Database.⁸ In addition, the McDonald's Side Salad is listed, but it was unclear if the nutritional information for the salad included the salad dressing. Thus, I could not be sure MyPyramid Tracker conducted an accurate nutritional evaluation of my food choices.

Additionally, the MyPyramid website informs people that french fries count toward discretionary calories, presumably due to the high fat content, but it did not indicate

how many discretionary calories a serving of french fries contains. As it turns out, one small serving of McDonald's french fries contains 227 calories, well below my 410 discretionary calories. Though this information is interesting, realistically speaking, is anyone going to do the research to find how many calories are in french fries so that they can deduct it from their daily total? Probably not.

In addition to the omission of various foods on the MyPyramid Tracker website, some MyPyramid dietary recommendations surprisingly differ from those provided by MyPyramid Tracker. My MyPyramid plan called for 9 oz of grains and 3.5 cups of vegetables. However, when I used MyPyramid Tracker to comply with these recommendations, I realized that it computed my compliance based on 8 oz of grains and 3 cups of vegetables. The feature on MyPyramid Tracker that automatically verified I was meeting or exceeding the MyPyramid recommendations was, in fact, not comparing my meals to MyPyramid. Instead, MyPyramid Tracker provided a false sense of accomplishment, informing me that my diet met the MyPyramid recommendations, when in fact it did not.

PROMOTING DISEASE, REDUCING HEALTH

After diligently preparing a menu based on the MyPyramid's sample menu, what can I conclude? First, as a general comment, although the online tools the USDA developed provide a wealth of information for the motivated consumer, I believe that the website and dietary message are too confusing to benefit most people. Second and more serious, when actually applied, some of the recommendations of MyPyramid/MyPyramid Tracker conflict with dietary science and could promote diseases such as CHD, prostate cancer, and possibly other chronic degenerative illnesses.

Fat

Although MyPyramid makes a laudable effort to differentiate between healthy and unhealthy fats, its most serious drawback is, as previously mentioned, that it does not account for the consumption of trans fatty acids. These fats are created by heating oils during frying and are added to packaged foods to increase their shelf life. Another drawback is that MyPyramid's fat guidelines are too general. MyPyramid advises, "Saturated fats, trans fats, and cholesterol tend to raise 'bad' (low-density lipoprotein, or LDL) cholesterol levels in the blood, which in turn increases the risk for heart disease. To lower risk for heart disease, cut back on foods containing saturated fats, trans fats, and cholesterol."⁹ But if I'm starting out consuming a large amount of these fats in my normal diet and then decrease them as MyPyramid recommends, I might wrongly conclude that I'm following a healthy diet that will protect me from CHD.

This problem is clarified for saturated fats and cholesterol—but not trans fats—if someone takes the time to use MyPyramid Tracker, but what percentage of people will actually do this? For those who don't, the misperceptions continue.

CHD is the leading cause of death in the United States for men and women and kills more women each year than breast cancer.¹⁰ CHD begins early in life. The American Heart Association estimates that 11.2% of men and 6.2% of women have CHD by the time they're between the ages of 2 and 34 years old. The incidence steadily increases until 77.8% of men and 86.4% of women aged 75 years or older have CHD.¹⁰ Proper dietary recommendations would help eliminate many known causes of CHD, and the contribution of trans fatty acids to the development of CHD is indisputable.

Using data from the Nurses' Health Study, Walter Willett, MD—who established the Nurses' Health Study II in 1989—showed 12 years ago that trans fatty acid consumption increases the risk of CHD.¹¹ Trans fatty acids adversely influence blood lipids, including LDL and high-density lipoprotein (HDL) cholesterol, triglycerides (TG), and lipoprotein(a).¹² They also decrease endothelial function and increase insulin resistance and thrombosis.¹² One clinical trial found that average LDL concentration significantly increased and average LDL particle size significantly decreased when volunteers consumed as little as 0.6 g trans fatty acids per 100 g of fat ($P < .05$).¹³ In a follow-up to the Nurses' Health Study, trans fat intake linearly correlated to plasma concentration of C-reactive protein (CRP), a marker of inflammation and an independent risk for heart disease ($P = .009$). CRP was 73% higher among women in the highest quintile of trans fatty acids intake (3.7 ± 0.6 g/d) compared to those in the lowest quintile (1.5 ± 0.3 g/d).¹⁴

MyPyramid allowed me to consume 2.46 g trans fatty acids out of a total 45.5 g fat in my diet, although the research overwhelmingly concludes that this level of trans fatty acid intake contributes to cardiovascular disease. If I were to follow the menu I created, which adheres to the MyPyramid fat guidelines, instead of following dietary guidelines that prohibit trans fatty acid consumption, I would be at increased risk for CHD.

Dairy

Dairy consumption in the amounts recommended by MyPyramid increases risk of prostate cancer, the leading cancer among men and the second leading cause of cancer mortality among men in the United States.¹⁵ Blacks are disproportionately affected by this disease. The incidence is 60% higher in black compared to white men.¹⁶ Compared to Asian/Pacific Islanders, black men are 3 times more likely to get prostate cancer and 6 times more likely to die from it.¹⁵

A review of 14 case-controlled studies and 9 cohort studies concluded that dairy intake “is one of the most consistent dietary predictors for prostate cancer in the published literature.”¹⁷ Data from the Physicians’ Health Study, in which diet and prostate cancer incidence were documented in 20,885 male physicians for 11 years, showed that those who consumed more than 2.5 servings of dairy products per day had a 1.34 relative risk of getting prostate cancer compared to those who consumed 0.5 servings per day.¹⁸ All MyPyramid diets include the recommendation to consume at least 2 cups per day of milk-based products, with the majority of diets recommending at least 3 cups per day.

A BETTER APPROACH

The first federal dietary guidelines were published in 1894 and were based on laboratory evaluations of macronutrients.¹⁹ Later publications also assessed micronutrient needs. Taking laboratory nutrition science and implementing it as food policy is a bottom-up approach that provides recommendations based on individual nutrients such as saturated fat, cholesterol, and calcium. This bottom-up approach is evident in the most recent *Dietary Guidelines* and food pyramid.

A top-down approach, also called “dietary pattern analysis” may provide more rational recommendations. Dietary pattern analysis shows that a whole-foods, plant-based diet decreases disease risk and promotes health.²⁰ Whereas the current USDA recommendations for saturated fat and cholesterol merely decrease the rate of cardiovascular disease development,²⁰ a whole-foods, plant-based diet can reverse cardiovascular disease. The heart-healthy effects of this diet have been demonstrated in separate clinical trials conducted by Caldwell B. Esselstyn, Jr, MD, at the Cleveland Clinic in Ohio²¹⁻²⁴ and Dean Ornish, MD, in Sausalito, Calif.²⁵⁻²⁷ Unlike the USDA recommendations, Esselstyn’s patients were required to avoid oils, meat, fish, fowl, and dairy products, which brought their average blood cholesterol level down from 246 mg/dL to 132 mg/dL and resulted in an opening of clogged arteries in 70% of his patients.

Similarly, in a controlled clinical trial, Ornish placed 28 volunteers on a plant-based, very low-fat diet, with only about 10% of calories coming from fat (compared to 20-35% recommended by the USDA) for 1 year. Rather than being limited to a specific number of food

servings as found in MyPyramid, Ornish’s volunteers could eat as much as they wanted from the acceptable foods list, which contained fruits, vegetables, and whole grains. The only animal products permitted were egg whites and 1 cup per day of nonfat milk or yogurt. Volunteers also were required to practice stress management techniques (eg, meditation) and exercise 3 hours per week. Average total cholesterol fell from 227 mg/dL to 172 mg/dL, and LDL-cholesterol decreased from 152 mg/dL to 95 mg/dL. Symptoms of chest pains decreased by 91% in the experimental group compared to an increase of 165% in the control group. Similar to participants in Esselstyn’s study, Ornish’s volunteers experienced a regression of their heart disease.

Clearly, the evidence for heart-healthy diets does not correspond with the USDA’s recommendations. Instead of trying to legislate by micro- and macronutrients, where the sum of the pieces doesn’t equal a healthy whole, a better approach that is also practical may be to embrace a dietary system. An example of a good, easy-to-implement whole-foods, plant-based diet is the Mediterranean diet, which stresses exercise, whole grains, fruits, vegetables, legumes, and nuts (Figure 3). It also recommends consuming 6 glasses of water per day. MyPyramid makes no mention of water intake. Following the Mediterranean diet has been shown

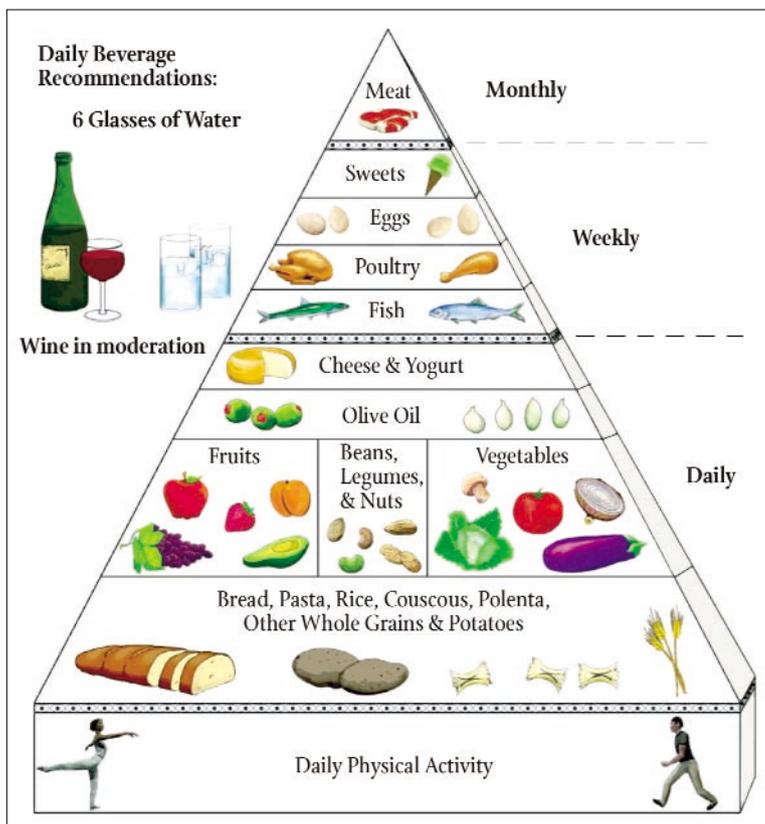


FIGURE 3
THE MEDITERRANEAN FOOD PYRAMID STRESSES A WHOLE-FOODS, PLANT-BASED DIET

to increase longevity,²⁸⁻³² lower incidences of metabolic syndrome (a precursor to diabetes),³³ decrease cardiovascular disease risk,³⁴⁻³⁷ and reduce the risk of death from cancer.³¹

CONCLUSION

There is no research that shows the MyPyramid dietary protocol reduces disease risk or mortality. In contrast, a whole-foods, plant-based diet has been confirmed in numerous epidemiological and clinical studies to improve health, decrease disease, and increase longevity. Let's hope that by the time the next reincarnation of the pyramid arrives, it provides an eating plan that adequately addresses the healthcare crisis in America.

NOTE

The HHS has developed a toolkit to educate professionals in the broader use of the *Dietary Guidelines* that includes educational information on USDA's MyPyramid. For more information, go to <http://www.health.gov/dietaryguidelines/dga2005/toolkit/>. For more information on the Mediterranean diet, Oldways Preservation and Trust maintains a website that includes the Mediterranean Diet Pyramid and supporting documentation. Go to http://www.oldwayspt.org/pyramids/med/p_med.html.

John Neustadt, ND, has written more than 100 published research reviews, is a regular contributor to *HerbalGram*, a publication of the American Botanical Council, and is a member of the American Association of Naturopathic Physicians' Scientific Affairs Committee. Before attending naturopathic medical school, Dr Neustadt worked for high-tech companies developing online consumer applications. Dr Neustadt is in private practice in Bozeman, Mont.

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