

# The SOY Connection

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## SOLID RESEARCH FOUNDATION BEHIND DIETARY GUIDELINES, MYPLATE RECOMMENDATIONS

By Joanne Slavin, PhD, and Katie Koecher

### Background of Dietary Guidelines

The Dietary Guidelines for Americans (DGAs) were first published in 1980.<sup>1</sup> DGAs have been published every 5 years since then. The DGAs impact nutrition policy. The need for “numbers” in the DGAs is driven by the relationship between the DGAs and federal nutrition programs.<sup>2</sup> Nutrition assistance programs such as school lunch and the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) are required to base regulations on the “most recent scientific knowledge,” which in the US is the DGAs.



Joanne Slavin, PhD, was a member of USDA's Dietary Guidelines Committee in 2010. She spoke to dietitians in Austin about the DGA development process at a seminar in 2012. Photo by Steve Veile.

The Dietary Guidelines Advisory Committee (DGAC) develops the scientific base for the DGAs. The 2010 DGAC included 13 members with wide expertise in nutrition, food science, life cycle nutrition, and nutrition education. The DGAC works in subcommittees to address questions of diet and disease risk; 2010 subcommittees were energy balance, carbohydrates and protein, fats, nutrient adequacy, sodium and fluids, and food safety.

The 2010 DGAC used an evidence-based review process with a hierarchy of evidence.<sup>3</sup> Strongest evidence is found in randomized, controlled trials (preferably double-blinded) followed by prospective cohort studies where a group or cohort

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### Topline Topics in this Issue

- How Soy Fits Into Dietary Guidelines for Americans
- Best of MyPlate Tracking Tools and Apps



FOCUS ON // **DIETARY GUIDELINES FOR AMERICANS**

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of subjects is studied over time. Food frequency instruments are often used to collect dietary information before any diagnosis of disease, making these studies more reliable than cross-sectional studies which make observations at a single point in time. No case-control studies, animal research, or in vitro studies are included in DGAC review, and typically cross-sectional studies are only included if no stronger prospective studies are available. The body of evidence for each question is then examined, and an evidence-based review process is used to conclude whether the evidence is strong, moderate, or limited. Agreeing on the strength of the relationship is difficult since, for each question, different types of studies have been published. For each question the 2010 DGAC addressed in the evidence-based report, the search criteria, inclusion and exclusion criteria for studies, the range of dates searched, and other information used in the review, are all available on the USDA portal.<sup>3</sup> The transparency used in an evidence-based approach is designed to minimize bias.<sup>4</sup>

So where and how does soy fit into the dietary guidelines? A versatile food, soybeans can be incorporated into the diet in many forms.<sup>5</sup> They can be eaten whole as immature beans (edamame), mature beans (soy nuts), or transformed into many products including soymilk, tofu, soy protein, or tempeh. Regardless of form, soy products are nutritionally dense and represent a dietary source of protein, vitamins, minerals, and in many instances, dietary fiber.<sup>6</sup> Whole soybeans are composed of more than 40% protein while soy protein isolates can contain upwards of 90% protein.<sup>7</sup>

### Protein

Protein needs are set based on ideal body weights (0.8g/kg body weight for adults) and average protein intake in the US is generally more than adequate. For men and women, protein provides about 15% of total calories. Protein found in animal sources such as meat, poultry, fish, eggs, and milk provide all nine indispensable amino acids and are referred to as "complete proteins." Protein found in plants, legumes, grains, nuts, seeds, and vegetables tend to be low relative to needs in one or more of the indispensable amino acids and are called "incomplete proteins." It is easy to complement protein sources; grains are low in lysine and high in methionine whereas legumes are low in methionine and high in lysine. Although plant based, soy protein is a high quality plant protein and isolates have 95–100% digestibility.<sup>8</sup>

Smit et al<sup>9</sup> estimated intakes of animal and plant protein in US adults, based on the Third National Health and Nutrition Examination Survey, 1988–1999. The main protein source in the American diet is animal protein

(69%), whereas grains (19%) contributed the most to plant protein consumption. Consumption of soy and other legumes is extremely low in the US population. This situation presents challenges in determining health outcomes with plant proteins. Most food frequencies do not track soy intake well, especially as newer sources of soy have entered the diet. Diets adequate in protein can be designed in many ways and are reflected in eating patterns around the world. Using the RDA for protein, a 150 pound adult would require 54 grams of high quality protein daily. Three ounces of lean meat contain about 25 grams of protein, 1 cup of milk (either dairy or soy) contains eight grams of protein, ½ cup tofu contains a minimum of 5.6 grams of protein, and cereals, grains, nuts, and vegetables contain about two grams of protein per serving.

### Plant protein and 2010 DGAC

The 2010 DGAC agreed to examine five questions on animal and plant proteins and health outcomes. A key question was as follows:

*"What is the relationship between vegetable protein and/or soy protein and selected health outcomes?"*

In regard to this question, the DGAC concluded:

*"Few studies are available, and the limited body of evidence suggests that vegetable protein does not offer special protection against type 2 diabetes, coronary heart disease, and selected cancers. Moderate evidence from both cohort and cross-sectional studies show that intake of vegetable protein is generally linked to lower blood pressure. Moderate evidence suggests*

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soy protein may have small effects on total and low density lipoprotein cholesterol in adults with normal or elevated blood lipids, although results from systematic reviews are inconsistent. A moderate body of consistent evidence finds no unique benefit of soy protein on body weight. A limited and inconsistent body of evidence shows that soy protein does not provide any unique benefits in blood pressure control.”



report does not provide sufficient evidence to conclude that increases in whole grain and fiber and decreases in dietary saturated fat, salt, and animal protein will lead to positive health outcomes. They state that lack of supporting evidence limits the value of the proposed recommendations as guidance for consumers or as the basis for public health policy. Their

The DGAC also noted the implications of its findings in regard to vegetable or soy protein and selected health outcomes:

*“Our review indicated that intake of vegetable protein is generally linked to lower blood pressure, but this could be due to other components in plant foods, such as fiber, or other nutrients. Individual sources of vegetable protein have no unique health benefits, so choice of plant protein sources can come from a wide range of plant-based foods. Consumption of plant proteins of lower quality is generally fine as long as calorie needs are met and effort is made to complement the incomplete vegetable protein. Consumption of lower-quality protein is of great concern when protein needs are high. Thus, consumption of lower-quality vegetable protein must be carefully considered during pregnancy, lactation, and childhood. Additionally, recommendations to lower caloric intake to combat obesity by increasing plant-based food intake must be linked to cautionary messages to maintain protein total intake of sufficient quality at recommended levels.”*

## Challenges in Evaluating Diet and Disease Relationships

Issues with contradictory evidence in the DGAC 2010 report were reviewed by Hite et al.<sup>10</sup> They suggest that the

support of lower carbohydrate intakes, a view shared by many of the public comments to the DGAC, is definitely an area needing more discussion for the 2015 Dietary Guidelines.

## Conclusions

The DGAC report is an evidence-based, systematic review written by the DGAC. The DGAs are written by the government based on the DGAC report. Food guides, such as MyPlate.gov are also written by government staff. The DGAC does not play a singular role in determining the DGAs or MyPlate.gov. The translational process—taking the scientific report and turning it into the DGAs—has been criticized for not being transparent to the public or even to the members of the DGAC.<sup>10</sup>

Efforts to micromanage the diet by imposing strict dietary rules are difficult to support with evidence-based nutrition science.<sup>11</sup> Because humans are omnivores, they can survive on a wide range of foodstuffs. Yet with the need to decrease calories to address the obesity epidemic, the protein content of the diet becomes more critical. Clear label information on total calories and protein in a consumed portion would be of benefit to consumers attempting to control calorie intake and obtain essential protein. Nutrient needs across the life cycle vary greatly, so general advice, although well-meaning, may actually be harming health status and making the obesity epidemic worse. 🍌

## ABOUT THE AUTHORS

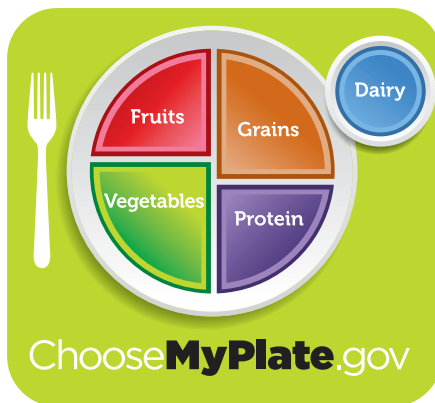
**Joanne Slavin, PhD, RD**, is Professor, Dept. of Food Science and Nutrition, University of Minnesota. She was a member of the 2010 Dietary Guidelines Advisory Committee.

**Katie Koecher** has a Bachelor of Science degree in Food Science and is a PhD candidate in Food Science at the University of Minnesota working in the area of dietary fiber and gut health, especially changes in microbiota.

# HOW SOY FITS INTO THE NEW DIETARY GUIDELINES

By Patricia Samour, RD, LDN and Vanessa Hinojosa

The key to good nutrition depends on the type and amounts of food consumed in relation to the amount of exercise. MyPlate is a great image—a plate—and is accompanied by messages to encourage consumers to make healthy choices. It is easy to understand and helps promote nutrition messages based on the 2010 Dietary Guidelines. In general, half of the plate should be fruits and vegetables; smaller amounts are protein, cereals, and dairy. MyPlate was developed as an effort to promote healthy eating for consumers. MyPlate does not, however, show specific amounts of foods to eat.



## How many fruits and vegetables should I include?

Fruits and vegetables compose half of MyPlate. Try to add different colors of fruits and vegetables to your plate. Vegetables can be eaten raw or cooked; you can get them fresh, frozen, canned or dried. Soybean (edamame) is considered a vegetable and can be added to a salad or eaten in their pods as a snack. Soybeans can also be mixed with other beans and salsa and served on a bed of mixed greens or in a taco.

## What about grains in MyPlate?

Grains compose 25% of MyPlate; you need at least half of your daily grain consumption to be whole grains. Examples of whole grains are brown rice, oatmeal and whole wheat flour. There are different ways to add soy products to grains. For example, soy crumbles can be cooked in a sauce pan with onions, tomato sauce and other seasonings and served over whole grain pasta. Serve soy crumbles in salsa inside whole wheat tortilla tacos.

## What soyfoods are in Protein Foods Group?

Many other soy products (such as tofu, tempeh and soy crumbles) are included in the Protein Foods Group. They are made from soybeans and are similar to other protein foods. For example, eat veggie burgers at a meal, like a hamburger. Serve soy crumbles or tofu in

tomato sauce over your favorite grain. Saute/grill tofu cubes as a stir fry, or serve as a shish kabob with sliced red peppers, onions and mushrooms with a citrus vinaigrette sauce. Soy nuts can be eaten as a snack, in tossed salads or added to other recipes that include nuts. Tofu is a great food to add to just about any sauce, in a salad or many other ways. Even those who say they don't like tofu would be surprised when it is added to sauces without their knowledge. Soyfoods are a great protein source and much healthier for the average American than most other high protein foods. Other soy protein options include smart deli baked ham style, bacon style strips, sausages, ground sausages style, chicken style and chorizo.

## What about fats, oils and sweets?

The MyPlate icon includes only the five food groups to help consumers prioritize their choices. Oils are typically a component in food. Fats and oils are high in calories and some are healthier than others. Soy oil is a great oil to use in cooking and in salad dressings because it provides a combination of omega-3 and omega-6 fatty acids. Use it in cooking your stir fry tofu and vegetable dishes; use in making your own salad dressing. If you are adventuresome, you can even make your own mayonnaise with soy oil.

## How much fiber should I eat?

Most adult Americans do not eat enough fiber. Aim for 28–32 grams of fiber per day. Some of the best sources of fiber include beans and peas, vegetables, fruits, whole grains, and nuts. Soyfoods such as soy nuts, soybeans and edamame are great sources of fiber.

## In what food group are soy milk and other soy products?

Fortified soy milk is in the Dairy Group as it provides a similar nutrition profile as cow's milk, particularly calcium, vitamin D, vitamin A, potassium, and protein. Other soyfoods in this group include soy cheese, soy yogurt and soy ice cream. 🍌

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# Healthy Handout

## BEST OF THE MYPLATE TRACKING TOOLS AND APPS

By Christine Palumbo, RD

In June 2011, the U.S. Department of Agriculture, along with First Lady Michelle Obama, unveiled the now-familiar MyPlate to replace the food pyramid. USDA harnessed the power of social media as a way to build public awareness of the accompanying website, [www.choosemyplate.gov](http://www.choosemyplate.gov), easily found by plugging in the words “myplate” or “choose myplate” into any search engine. Choose MyPlate is a comprehensive website that includes sample menus and recipes, daily food plans and SuperTracker, among other features.

The SuperTracker page puts MyPlate to work by personalizing recommendations for what and how much to eat, and the amount of physical activity required. With the latest feature of the SuperTracker allowing users to set their own personal calorie goal, this already popular feature of MyPlate now provides even more value to consumers.

SuperTracker is a highly visual site that allows users to create a profile and from that obtain a personalized nutrition and physical activity plan. Specific tools include the Food Tracker, Food-A-Pedia, Physical Activity Tracker, My Weight Manager, My Top 5 Goals and My Reports. Let’s look at a few of these.

### SuperTracker tools

**Food Tracker.** Under Daily Limits, you can see calories consumed, including “empty calories,” as well as bar charts showing the level of oil, saturated fat and sodium consumed.

**Daily Food Group Targets.** Whether you prefer tables or color-coded bar graphs, these show daily targets and whether or not you’re under, at, or over your targets for each food group.

**My Coach Center** is where you set up your personal goals. Goals can be set for weight management, physical activity, calories, food groups and nutrients. Sign up to receive tips and support related to your goals daily, weekly or monthly either by email or in My Coach Center.

**Food-A-Pedia** allows a user to type in the name of a food prior to consuming in order to learn its nutrient content. For example, by typing in “edamame,” you learn one cup provides 189 calories, 17 grams protein, 15 grams carbohydrate, 8 grams dietary fiber, 1 gram saturated fat, 2 grams monounsaturated fat, 3 grams polyunsatu-

rated fat, 59% DV for copper, 46% DV vitamin K and 50% DV  $\alpha$ -linolenic acid. You can also choose whether to count it as a vegetable or a protein source.

### Nutrition Education Series

Available in both English and Spanish, the *10 Tips Nutrition Education Series* of handouts provides consumers and professionals with high quality, actionable tips in a convenient, printable format. These are perfect for posting on a refrigerator, for example.

### Practical Tips

SuperTracker empowers users at all their decision points in a day. It’s fun to use since food journaling is now electronic, interactive and motivating.

1. Create a personalized profile. You can then track your diet, intensity and duration of exercise, and even location and mood during meals and snacks. The latest version allows users to set a personal calorie goal, rather than relying on set calorie levels.
2. Using the My Reports tab, you can share your progress using the share tools via Facebook, Twitter, Stumbleupon, Google, Bookmarks, Digg, Reddit, LinkedIn, Windows Live Messenger, MySpace and Email. For example, you can email reports to your dietitian or bring in to your next appointment. Together you can review the reports and set new goals. Or, when a user reaches a goal, My Coach Center gives you the option to share this on Facebook and Twitter.
3. You can sign up to follow selected food groups on Twitter and to receive nutrition tips related to that group biweekly. Food group handles are @MyPlateProtein, @MyPlateVeggies, @MyPlateDairy and @MyPlateFruits.
4. SuperTracker makes it easy to learn about simple food swaps. For example, shifting to more nutrient-rich foods like whole grains like brown rice, barley and whole wheat pasta.
5. For the more mature, encourage your children or grandchildren to help you set up your profile. Setting goals and tracking diet and exercise can then become a family activity to be shared. This could be done even if family members live far away. 🍌

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**Christine M. Palumbo, MBA, RD** is principal of Christine Palumbo Nutrition, a nutrition communications practice in suburban Chicago. In addition, she’s on the faculty of Benedictine University and pens the Good Sense Eating column for *Chicago Parent* magazine. She is a former board member of the Academy of Nutrition and Dietetics.



## Research Update

By Mark Messina, PhD

### Isoflavones Safe Approach For Menopausal Symptoms

Further evidence in support of soy isoflavones as a safe approach for alleviating menopausal hot flashes comes from a one-year study conducted by Italian researchers.<sup>1</sup>

For this study, 130 postmenopausal women suffering from menopausal symptoms were given either 60 mg soy isoflavones and *Lactobacillus sporogenes* (intended to improve isoflavone absorption) or a placebo comprised of calcium and vitamin D3. Hot flashes in the isoflavone group decreased steadily over the one year study period from 34.4% at 3 months to 50.3% at 12 months, whereas in women given calcium and vitamin D, symptoms decreased by only 2.7% at 3 months and 7.9% at 12 months.

The differences between groups were statistically significant at each time point. Furthermore, there were no differences between groups in endometrial thickness and mammographic density;

these two measures are markers for endometrial and breast cancer, respectively. These findings agree with a recently published two-year study that also found no effects of isoflavones on these two markers of cancer risk and reported isoflavone supplementation reduced adverse reports of menopausal symptoms in comparison to the placebo.<sup>2</sup> 🍌

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**Mark Messina, PhD** is the co-owner of Nutrition Matters, Inc., a nutrition consulting company, and is an adjunct professor at Loma Linda University. His research focuses on the health effects of soyfoods and soybean components. He is chairperson of *The Soy Connection* Editorial Board.

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