

# Legumes: Health Benefits and Culinary Approaches to Increase Intake

Rani Polak,<sup>1</sup> Edward M. Phillips,<sup>1</sup> and Amy Campbell<sup>2</sup>

Much evidence supports the health benefits of consuming a plant-based diet and increasing the intake of legumes. A high intake of fruits, vegetables, whole grains, legumes (beans), nuts, and seeds is linked to significantly lower risks of heart disease, high blood pressure, stroke, and type 2 diabetes (1,2). The American Diabetes Association's nutrition therapy recommendations for the management of adults with type 2 diabetes note that many eating patterns are acceptable for people with diabetes. Several diets, including the DASH (Dietary Approach to Stop Hypertension) and Mediterranean-style plans, although not strictly vegetarian, still promote increased intake of plant-based foods such as legumes and their associated health benefits (3). Although research supports the benefits of legume consumption, only ~8% of U.S. adults report eating legumes on any given day (4). The purpose of this article is to highlight the research demonstrating the benefits of increasing legumes in the diet and to offer practical suggestions to aid health care providers in increasing their own legume intake and more confidently discussing such a goal with their patients.

Unlike with some other chronic conditions, individuals who have type 2 diabetes are responsible for providing up to 95% of their own care (5). One of the most challenging aspects of type 2 diabetes care is helping patients adopt healthier behaviors. When nutrition therapy is

provided by a qualified professional, people can learn how to make better food choices to help improve their glycemic control, blood pressure, cholesterol, and BMI (6). In fact, medical nutrition therapy (MNT), as provided by a registered dietitian, has been shown to improve glycemic control outcomes and reduce health care costs to Medicare (7).

Recent literature demonstrates the benefit of augmenting this nutritional information with skills-based culinary education. Robust correlations exist between healthy food preparation skills and improved dietary quality (8) and between time spent in the kitchen and mortality (9), supporting the importance of preparing meals oneself. However, a 2007–2008 survey evaluating trends in U.S. home food preparation found a decrease in cooking activities (10). In response, it has been recommended that nutrition counseling expand from a primary focus on nutrients to include developing practical culinary skills (e.g., meal planning, shopping, food storage, and food preparation) (11–13). Culinary education was found to improve attitudes regarding healthy cooking (14) and to increase time spent cooking (15), confidence in cooking (16), healthy food consumption (14,15), and health outcomes (17). One program was reported to improve the pattern of nutrient intake in people with type 2 diabetes (18).

Providers, including physicians, dietitians, nurses, and pharmacists, can provide the knowledge and tools

<sup>1</sup>Institute of Lifestyle Medicine, Joslin Diabetes Center, Department of Physical Medicine & Rehabilitation, Harvard Medical School, Boston, MA

<sup>2</sup>Good Measures—Education Content Development and Training, Boston, MA

Corresponding author: Rani Polak, Rani.Polak@joslin.harvard.edu

DOI: 10.2337/diaclin.33.4.198

©2015 by the American Diabetes Association. Readers may use this article as long as the work is properly cited, the use is educational and not for profit, and the work is not altered. See <http://creativecommons.org/licenses/by-nc-nd/3.0> for details.

to help build skills and facilitate behavior change, but they can further help their patients (and themselves) in another way: by serving as role models for their patients. Individuals with diabetes who receive counseling from providers who value the importance of a healthful diet—and model this behavior by working to improve their own eating behaviors—are more likely to adopt a healthful eating plan (19,20).

Knowledge, skills, and tools aimed at increasing consumption of legumes are provided in the following sections and can help health care providers improve both their own and their patients' eating habits.

### Health Benefits of Legumes

By definition, beans are edible, nutritious seeds in the form of pods within the legume family. There are many varieties of legumes (sometimes called “pulses”). Some common types include kidney beans, cannellini beans, Great Northern beans, navy beans, fava beans, cranberry beans, black beans, pinto beans, soy beans, black-eyed peas, chickpeas, and lentils (21).

Many people are surprised to learn just how nutritious legumes are. They provide fiber, protein, carbohydrate, B vitamins, iron, copper, magnesium, manganese, zinc, and phosphorus. Legumes are naturally low in fat, are practically free of saturated fat, and because they are plant foods, they are cholesterol free as well. One serving of legumes, which is one-half cup, provides about 115 calories, 20 g of carbohydrate, 7–9 g of fiber, 8 g of protein, and 1 g of fat. Legumes also have a low glycemic index, generally ranging between 10 and 40.

Legumes are an integral part of many healthy eating patterns, including the Mediterranean style of eating, the DASH eating plan, vegetarian and vegan diets, and lower-glycemic-index (GI) diets. Along with being a highly nutritious food, evidence shows that legumes can play an important role in the prevention and

management of a number of health conditions.

### Type 2 Diabetes

A diet rich in plant-based foods, including legumes, and lower in refined grains, sugar-sweetened beverages, and processed meats has been shown to lower the risk of developing type 2 diabetes and, for those who have diabetes, to improve both glycemic and lipid control (22). In one study, 121 subjects with type 2 diabetes were randomized to either a low-GI diet emphasizing legume consumption (target: 1 cup/day of cooked legumes, or ~190 g) or a diet emphasizing wheat fiber foods. After 3 months, 93.3% completed the low-GI legume diet arm and reported an average intake of 211 g/day. A similar proportion (95.1%) completed the high-wheat fiber diet arm. Mean A1C fell by 0.5% ( $P < 0.001$ ) with the low-GI legume diet with significant decreases in total cholesterol and triglyceride levels, as well as decreases in systolic and diastolic blood pressure compared to the diet high in wheat fiber foods (23). Other studies have also reinforced the positive effects of legumes on reductions in A1C and blood glucose levels (24,25).

### Hyperlipidemia

Regularly eating legumes may help lower total and LDL cholesterol levels. A meta-analysis of 10 randomized, controlled trials in which non-soy legumes were consumed for a minimum of 3 weeks revealed that eating legumes has a cholesterol-lowering effect. The mean net change in total cholesterol in the legume-eaters compared to a control group was  $-11.8$  mg/dL (95% CI  $-16.1$  to  $-7.5$ ), and the mean net change in LDL cholesterol was  $-8.0$  mg/dL (95% CI  $-11.4$  to  $-4.6$ ) (26). In another trial, 31 subjects with type 2 diabetes followed either a legume-free therapeutic diet for heart disease or the same diet replacing two servings of red meat with legumes on 3 days/week. Researchers saw improvements with the legume group in LDL cho-

lesterol and triglycerides, as well as in fasting blood glucose and insulin levels (27).

### Hypertension

Legumes are rich in potassium, magnesium, and fiber, all nutrients that have a positive impact on blood pressure management (28). A systematic review and meta-analysis combined the results of eight trials involving >500 people, half of whom were overweight or obese, and found reductions in blood pressure in those who ate legumes. In subjects who consumed slightly less than 1 cup of legumes each day for 10 weeks, both systolic and mean arterial blood pressure were significantly decreased (29). In another study, 113 obese subjects consumed two servings of legumes and four servings of whole grains per day for 18 months in place of refined carbohydrate foods. Blood pressure, triglycerides, weight, and waist circumference were reduced (30).

### Weight Management

A diet that regularly includes legumes may help with weight control. The fiber, protein, and slowly digested carbohydrate found in legumes may aid in satiety. Using data from the National Health and Nutrition Examination Survey (NHANES), it was observed that adults who consumed a variety of legumes had significantly lower body weights compared with those who did not consume legumes. Legumes consumers also were much less likely to be obese (BMI  $>30$  kg/m<sup>2</sup>) than non-consumers (31). Furthermore, evidence supports the beneficial effect of a Mediterranean-style eating plan, which is rich in legumes, fiber, and monounsaturated fat, for weight loss (32).

Despite the well-documented health benefits of legume consumption, the actual intake of legumes remains low. According to NHANES data, on any given day, only ~8% of adults consume dry legumes and peas (4). This may be attributed, in part, to people's unfamiliarity with how to



# Orange Lentil Salad With Feta and Fresh Herbs

Serves 8 / Serving size: 1/2 cup

## INGREDIENTS

- 7 oz split orange lentils, picked over and rinsed
- 2 pinches Atlantic sea salt
- 3 Tbsp. fresh lemon juice
- 3 Tbsp. extra-virgin olive oil
- 1 clove garlic, crushed
- 1 Tbsp. chopped fresh mint
- 2 Tbsp. chopped fresh parsley
- 1 oz low-fat, semi-soft white cheese, such as feta
- Pinch ground black pepper

## DIRECTIONS

Place lentils in a small pot and add water with a pinch of salt to cover. Bring to a boil over medium heat, and then immediately remove from heat and drain. Rinse lentils in cold water and drain in a colander.

Transfer lentils to a salad bowl. Add lemon juice, oil, garlic, mint, parsley, and cheese. Let sit for at least 30 minutes at room temperature for flavors to blend. Add salt and pepper before serving.

*Nutrition information: calories, 125; total fat, 5 g; calories as fat, 36%; saturated fat, 1 g; cholesterol, 3 mg; carbohydrate, 15 g; dietary fiber, 3 g; sodium, 114 mg; protein, 6 g; carbohydrate choices, 1; Exchanges, 1 starch, 1 fat.*

*Recipe and photo reprinted with permission from Polak R. Delicious Diabetic Recipes. Watertown, Mass., Charlesbridge Publishing, 2009.*

prepare and incorporate them into their eating plan.

### Preparing Legumes

There are many myths about alleged difficulties in preparing legumes. Some people imagine long soaking periods, whereas others dread complicated preparation techniques. The truth is that legumes are very easy to use, especially when you know some tips about preparing them.

### Lentils

Lentils come in a variety of colors, including orange, green, and black. Not only do many lentils have relatively short cooking times, they do not require advance soaking. Even lentils that are relatively slow to cook require just 20 minutes of cooking

time. To prepare lentils, place them in a small pot and add water, with a pinch of salt, to cover. Bring to a boil over high heat, then reduce the heat and simmer, uncovered, for about 20 minutes, until lentils are soft. Drain the lentils and use them as discussed below. To reduce preparation time even more, you can always prepare a double batch of lentils when you do cook them; cooked lentils can be stored in the refrigerator up to 5 days.

Split orange lentils are particularly easy to prepare; rinse them, put them in a pot with cold water and salt (3 cups of water for every cup of lentils), and bring to a boil. When the water boils (3–5 minutes), the lentils are ready. Drain the lentils, rinse them in cold water to stop the cooking

process, and then use them in your recipe. Keeping these easy-to-prepare lentils on hand will enable you to use them whenever you like.

The texture of quickly cooked lentils should be a bit crunchy; if you want them softer, cook the orange lentils longer, up to 6–8 minutes. If you cook lentils for a long time, their texture becomes very soft, and they may almost seem pureed. Lentils cooked in this manner can be made into a thick, Indian-style sauce by adding spices such as curry, turmeric, cumin, and garam masala and served over brown rice.

### Slow-Cooked Legumes

A few members of the legume family, including chickpeas and kidney beans,



## Aromatic Mixed Rice and Lentils

Serves 10 / Serving size: 1/2 cup

### INGREDIENTS

1 Tbsp. extra-virgin olive oil  
 1 large onion, chopped  
 1 clove garlic, crushed  
 1/2 tsp. ground cardamom  
 1/2 tsp. ground cinnamon  
 1/2 tsp. ground allspice  
 1 cup brown rice, soaked overnight and drained  
 1 cup green lentils, picked over and rinsed  
 1/2 tsp. Atlantic sea salt  
 1/2 tsp. ground black pepper  
 1/2 cup chopped fresh parsley, for garnish

### DIRECTIONS

In a large pot, heat oil over medium-high heat. Add onion and sauté until brown, about 5 minutes. Mix in garlic, cardamom, cinnamon, and allspice and sauté for 1 minute. Add rice and mix to combine. Add enough water to cover rice with 1/2 inch of liquid and cover pot. Increase heat to high and bring to a boil, then reduce heat to low and cook for about 30 minutes, until liquid is absorbed and rice is soft.

In the meantime, place lentils in a small pot and add water with a pinch of salt to cover. Bring to a boil over high heat; then reduce heat and simmer, uncovered, for about 20 minutes, until lentils are soft.

Drain lentils and mix into rice. Add salt and pepper to taste, and garnish with parsley before serving.

*Nutrition information: calories, 156; total fat, 2 g; calories as fat, 12%; saturated fat, 0 g; cholesterol, 0 mg; carbohydrate, 28 g; dietary fiber, 7 g; sodium, 120 mg; protein, 7 g; carbohydrate choices, 2; Exchanges, 2 starch.*

*Recipe and photo printed with permission from Polak R. Delicious Diabetic Recipes. Watertown, Mass., Charlesbridge Publishing, 2009.*

need more time to cook. Soak the legumes overnight and drain. Then, in a large pot, combine legumes, water, and 1 tsp. of baking soda (to help soften the legumes more quickly), and bring to a boil over high heat. Reduce heat to medium and cook, uncovered, for about 2 hours, until the legumes are soft. Drain the legumes, season with salt and pepper (with this kind of legume it is preferable to season at the end of the cooking process), and set aside to cool.

Although it takes some time, soaking and cooking the legumes does not take much planning or effort.

You can also prepare slow-cooking legumes in advance and store them in the freezer. The next time you prepare slow-cooking legumes such as chickpeas or white beans, prepare a double batch and freeze the portion you are not using immediately in freezer-safe storage bags.

If you would like to start using legumes but are concerned about the preparation time, you can start with using prepared beans, which may be purchased frozen or canned. Most canned beans are high in sodium, so look for lower-sodium varieties, and rinse them before using.

### Incorporating Legumes Into Your Meal Plan

#### Legume Salad

A basic legume salad can be made from a combination of any kind of cooked legumes, together with chopped herbs, lemon juice, olive oil, salt, and pepper. Then, you can add chopped vegetables or fruit, cheese cubes, or even slices of chicken breast. See, for example, the recipe for Orange Lentil Salad With Feta and Fresh Herbs in the box on p. 200. For variety, add walnuts, diced tomato, celery slices, sliced chicken breast, or any combination of these ingredients.



# Sea Bass With Vegetables and Chickpeas

Serves 4 / Serving size: 1 fillet + 1/2 cup vegetables

## INGREDIENTS

### Chickpeas:

- 2 lb dry chickpeas, soaked overnight and drained (1/2 cup for this recipe)
- 5 quarts water
- 1 Tbsp. baking soda
- 1/2 tsp. Atlantic sea salt
- 1/2 tsp. ground black pepper

### Fish:

- 2 Tbsp. extra-virgin olive oil
- 4 cloves garlic, finely chopped
- 1 1/3 lb Swiss chard, stalks removed and thinly sliced
- Pinch Atlantic sea salt
- Pinch ground black pepper
- 2 cups dry white wine
- 4 4-oz sea bass fillets
- 2 Tbsp. fresh lemon juice
- 2 medium tomatoes, cut into 1/4-inch cubes

## DIRECTIONS

**Prepare chickpeas:** In a large pot, combine chickpeas, water, and baking soda and bring to a boil over high heat. Reduce heat to medium and cook, uncovered, for about 2 hours, until chickpeas are soft. Drain chickpeas, season with salt and pepper, and set aside to cool. Reserve 1/2 cup of the chickpeas for this recipe and transfer the rest to freezer-safe storage bags or containers. Freeze for up to 4 months.

**Prepare fish:** Place wok on medium-high heat and add oil, swirling to coat. Add garlic and sauté gently for 3 minutes, until brown. Add Swiss chard, salt, and pepper and steam until chard wilts, about 3 minutes. Using a slotted spoon, remove chard from pan and transfer to a plate.

Add wine to pan and bring to a boil over medium-high heat. Add fish and cook for 5 minutes, until fish is opaque. Add chickpeas, lemon juice, tomatoes, and chard and cook for 3 minutes.

*Nutrition information: calories, 282; total fat, 10 g; calories as fat, 32%; saturated fat, 2 g; cholesterol, 45 mg; carbohydrate, 15 g; dietary fiber, 4 g; sodium, 682 mg; protein, 25 g; carbohydrate choices, 1; Exchanges, 3 lean meat, 1/2 starch, 2 vegetable.*

*Recipe and photo reprinted with permission from Polak R. Delicious Diabetic Recipes. Watertown, Mass., Charlesbridge Publishing, 2009.*

You can also replace the orange lentils with cooked green lentils, chickpeas, or white beans.

This salad can be prepared a full day in advance if you leave out the cheese cubes until just before serving. Simply mix the rest of the ingredients and let the salad sit covered in your refrigerator. You can also let it sit at room temperature; some lentils may sprout while the salad is marinating,

giving the salad a softer texture and more interesting appearance.

### Legumes Soup

Legumes are an excellent soup ingredient. Because soups often require longer cooking times, you may not mind the amount of time required to cook legumes for this purpose. Take your favorite combination of legumes and vegetables, simmer them together for 30–40 minutes, add a few herbs

and some lemon juice, and you will have a nice Mediterranean soup. For example, in a large pot, bring 1 cup of red lentils, 6 cups of water, and a pinch of salt to a boil over high heat. Reduce heat to low and cook, uncovered, for 30 minutes, until soft. Periodically remove the foam that forms on top. In the meantime, heat 2 Tbsp. of olive oil in a large frying pan over medium heat. Add 1 cup of

chopped celery and 6 crushed garlic cloves, and sauté for 2 minutes until brown. Add about a half bunch of chopped cilantro and 4 peeled turnips cut into 1/2-inch cubes, and cook for 2 minutes. Add turnip mixture to lentils and cook for 20 minutes. Mix in 3 Tbsp. of lemon juice and cook for an additional 3 minutes. Add salt and pepper to taste and serve.

Another way to make legume soup is by cooking the legumes with aromatic ingredients such as onion, garlic, or leeks until soft. Then transfer everything to a food processor or use an immersion blender and puree until smooth. You can also add your favorite legumes to any soup you prepare regularly.

### **Legumes as a Whole Vegetarian Meal**

All legumes, when served with a grain, contain all the essential amino acids and are recommended as protein choices, especially for vegetarians or vegans. For example, the famous Mediterranean dish *majadra* traditionally combines rice and green lentils and can be made easily from leftovers as in the recipe for *Aromatic Mixed Rice and Lentils* in the box on p. 201.

This recipe is very adaptable. Replace the green lentils with black lentils or mung beans, or replace the brown rice with wheat berries. Adding vegetables to this recipe is an excellent way to improve the nutritional value and enhance the flavor. Sauté 1 cup sliced button mushrooms in 2 Tbsp. of unrefined canola oil and spoon over the rice and lentil mixture just before serving.

### **Adding Legumes to Everyday Cooking**

Having a supply of cooked legumes in your refrigerator or freezer will enable you to add them to almost any dish you make. For example, add 1 Tbsp. of prepared lentils to every cup of prepared rice or quinoa to enrich the color and texture of these grains. Try adding legumes to your beef stew or fish as in the recipe for *Sea Bass With*

**TABLE 1. Practical Pointers for Increasing Your Intake of Legumes**

Make sure you always have lentils in your pantry. They are the quickest legume to prepare.
Buy legumes even if you are not sure when you are going to use them. Dry legumes are good to have on hand and rarely spoil.
The next time you enter the kitchen to cook, even just for 20 minutes, boil a pot filled with water and lentils. Once you finish your dinner, the lentils will be ready to cool and store in the refrigerator for later use.
Save time by preparing the whole package of lentils instead of just what you need right now. Store half of the leftovers in the freezer and the other half in the refrigerator.
Soaking legumes? Make a double portion and freeze the soaked legumes for future cooking.
Use the cooked legumes in your refrigerator as a side dish with your dinner, or add them to your next soup or stew.
Bring a legume salad to work for lunch.
When your refrigerator legumes are almost gone, defrost some frozen ones to replenish your supply.
Once you become comfortable cooking legumes, try preparing two different kinds at one time.

**TABLE 2. Tips for Cooking With Legumes**

Soak larger legumes such as chickpeas and kidney beans for 24 hours in cold water before preparing.
When preparing legumes other than lentils, add the salt at the end of the cooking process.
Legumes absorb a lot of water. Add at least 3 cups of water to each cup of legumes you cook.
Drain prepared legumes well before storing. It will increase their shelf life and improve their quality for later cooking.
During cooking, use a ladle to occasionally remove the foam that rises to the top.
Legume salads taste even better when allowed to marinate with the other ingredients for at least 30 minutes before serving.
Use the legume cooking liquid instead of water when you process legumes to make hummus or other types of spreads or dips.
Add legumes to meat recipes. The taste combination is great!
Add a squeeze of lemon any time you feel that your legume salad or soup needs more flavor.
Ready for a challenge? Try undercooking legumes for salad, until they are just partially soft. Then let them stand in the dressing for more than 30 minutes for a great texture and taste.

*Vegetable and Chickpeas* in the box on p. 202. If you want to vary the recipe, replace the chickpeas with black or white beans or with any other legume whose color goes well with the other ingredients. Any kind of legume can be added to a variety of salads as well. The next time you make a green salad, toss in a bunch of legumes to

add protein and fiber and enhance the color, texture, and taste.

### **Upgrading Your Legume Recipes**

A squeeze of lemon juice will probably enhance the flavor of any legume dish, whether warm, like soup or legume stew, or cold, like salad. Yogurt might also be just what a legume dish

needs to make its flavor complete. Serve legume soups with a small bowl of yogurt or the majadra topped with 3 Tbsp. of plain yogurt. It usually takes time for legumes to absorb some of the flavors. If you are not satisfied with the result immediately, taste it again before serving.

### Making Legume Sprouts

The nutritional benefit of including legume sprouts in one's eating plan is that they are low in calories and carbohydrate. For example, 1 cup of raw mung bean sprouts (which shrinks to 1/2 cup cooked bean sprouts) contains just 31 calories and 6 g of carbohydrate, along with 2 g of fiber and 3 g of protein. Mung bean sprouts also provide vitamin C, vitamin K, and folate.

The culinary benefit of including legume sprouts is that they do not need to be cooked. All you need to make sprouts are legumes and some room in your pantry. Every type of raw legume can sprout as long as it is in its natural form and has not been cut or split. The process is simple: let the legumes soak for 10–24 hours, and then spread them in a layer on a large plate, tray, or colander. Make sure the layer is no more than a couple of legumes thick. Cover the legumes with a damp kitchen towel or with plastic wrap that is pierced in a few spots with a fork, and place them in a dark place. The seed sprouts are ready to eat when tiny sprouts appear on each legume. They can be eaten immediately or stored in the refrigerator for 3–4 days.

You can sprout legumes even if you do not use legumes for cooking. It does not take very much time to fill a bowl with water and soak a few chickpeas or lentils, and once you do it a few times, you will easily get into the routine. Some stores even sell special containers for storing legumes during the sprouting process.

Table 1 provides a list of practical pointers for people who want to increase their intake of legumes. Table 2 summarizes useful tips for

cooking with legumes. Consider attaching both to your refrigerator door and sharing them with your patients.

### Conclusions

Nutrition has moved from being viewed only as a preventive modality to being recognized as a disease management tool. Incorporating healthy nutrition into both your own life and your clinic routines might be a meaningful change that you can implement one bite at a time. Just as you would advise your patients, start with a few small changes, and when those become habits, think about bigger ones. The time for nutritious food is now.

### Duality of Interest

Dr. Polak receives author royalties for *Delicious Diabetic Recipes: The Gourmet Cookbook for a Healthy Life*, published in 2009 by Charlesbridge. Dr. Phillips receives author royalties for *ACSM's Exercise is Medicine: A Clinician's Guide to Exercise Prescriptions*, published by Lippincott, Williams & Wilkins in 2009. Ms. Campbell is a writer/blogger for the Internet sites Diabetes Self-Management and Diabetic Connect. No other potential conflicts of interest relevant to this article were reported.

### References

1. Hu FB. Plant-based foods and prevention of cardiovascular disease: an overview. *Am J Clin Nutr* 2003;78:544S–551S
2. Orlich MJ, Fraser GE. Vegetarian diets in the Adventist Health Study 2: a review of initial published findings. *Am J Clin Nutr* 2014;100(Suppl. 1):353S–358S
3. Evert AB, Boucher JL, Cypress M, et al. Nutrition therapy recommendations for the management of adults with diabetes. *Diabetes Care* 2013;36:3821–3842
4. Mitchell DC, Lawrence FR, Hartman TJ. Consumption of dry beans, peas, and lentils could improve diet quality in the U.S. population. *J Am Diet Assoc* 2009;109:909–1013
5. Anderson RM, Funnell MM, Butler PM, et al. Patient empowerment: results of a randomized controlled trial. *Diabetes Care* 1995;18:943–949
6. Franz MJ, Monk A, Barry B, et al. Effectiveness of medical nutrition therapy provided by dietitians in the management of non-insulin-dependent diabetes mellitus: a randomized, controlled clinical trial. *J Am Diet Assoc* 1995;95:1009–1017
7. Institute of Medicine. The Role of Nutrition in Maintaining Health in the Nation's Elderly: Evaluating Coverage

of Nutrition Services for the Medicare Population. Washington, D.C., National Academies Press, 2000

8. Larson NI, Perry CL, Story M, Neumark-Sztainer D. Food preparation by young adults is associated with better diet quality. *J Am Diet Assoc* 2006;106:2001–2007
9. Chen RC, Lee MS, Chang YH, Wahlqvist ML. Cooking frequency may enhance survival in Taiwanese elderly. *Public Health Nutr* 2012;15:1142–1149
10. Smith PL, Ng WS, Popkin MB. Trends in U.S. home food preparation and consumption: analysis of national nutrition surveys and time use studies from 1965–1966 to 2007–2008. *Nutr J* 2013;12:1–10
11. Lichtenstein AH, Ludwig DS. Bring back home economics education. *JAMA* 2010;303:1857–1858
12. Hartmann C, Dohle S, Siegrist M. Importance of cooking skills for balanced food choices. *Appetite* 2013;65:125–131
13. Soliah LAL, Walter JM, Jones SA. Benefits and barriers to healthful eating: what are the consequences of decreased food preparation ability? *Am J Lifestyle Med* 2012;6:152–158
14. Levy J, Auld G. Cooking classes outperform cooking demonstrations for college sophomores. *J Nutr Educ Behav* 2004;36:197–203
15. Eisenberg DM, Myrdal Miller A, McManus K, Burgess J, Bernstein AM. Enhancing medical education to address obesity: "See one. Taste one. Cook one. Teach one." *JAMA Intern Med* 2013;173:470–472
16. Wrieden WL, Anderson AS, Longbottom PJ, et al. The impact of a community-based food skills intervention on cooking confidence, food preparation methods and dietary choices: an exploratory trial. *Public Health Nutr* 2007;10:203–211
17. Gatto NM, Martinez LC, Spruijt-Metz D, Davis JN. LA Sprouts randomized controlled nutrition and gardening program reduces obesity and metabolic risk in Latino youth. *Obesity (Silver Spring)*. 2015;23:1244–1251
18. Archuleta M, Vanleeuwen D, Halderson K, et al. Cooking schools improve nutrient intake patterns of people with type 2 diabetes. *J Nutr Educ Behav* 2012;44:319–325
19. Frank E, Breyan J, Elon L. Physician disclosure of healthy personal behaviors improves credibility and ability to motivate. *Arch Fam Med* 2000;9:287–290
20. Frank E, Dresner Y, Shani M, Vinker S. The association between physicians' and patients' preventive health practices. *CMAJ* 2013;185:649–653
21. Grains & Legumes Nutrition Council. Types of legumes. Available from <http://www.glnc.org.au/legumes/types-of-legumes>. Accessed 14 March 2015
22. Ley SH, Hamdy O, Mohan V, Hu FB. Prevention and management of type 2 dia-

- betes: dietary components and nutritional strategies. *Lancet* 2014;383:1999–2007
23. Jenkins DJA, Kendall CW, Augustin LS, et al. Effect of legumes as part of a low glycemic index diet on glycemic control and cardiovascular risk factors in type 2 diabetes mellitus. *Arch Intern Med* 2012;172:1653–1660
24. Rizkalla SW, Bellisle F, Slama G. Health benefits of low glycaemic index foods, such as pulses, in diabetic patients and healthy individuals. *Br J Nutr* 2002;88(Suppl. 3):S255–S262
25. Barnard ND, Cohen J, Jenkins DJA, et al. A low-fat vegan diet and a conventional diabetes diet in the treatment of type 2 diabetes: a randomized, controlled 74-wk clinical trial. *Am J Clin Nutr* 2009;89(Suppl.):1S–9S
26. Bazzano LA, Thompson AM, Tees MT, et al. Non-soy legume consumption lowers cholesterol levels: a meta-analysis of randomized controlled trials. *Nutr Metab Cardiovasc Dis* 2011;21:94–103
27. Hosseinpour-Niazi S, Mirmiran P, Hedayati M, Azizi F. Substitution of red meat with legumes in the therapeutic lifestyle change diet based on dietary advice improves cardiometabolic risk factors in overweight type 2 diabetes patients: a cross-over randomized clinical trial. *Eur J Clin Nutr* 2015;69:592–597
28. Ascherio A, Rimm EB, Giovannucci EL, et al. A prospective study of nutritional factors and hypertension among U.S. men. *Circulation* 1992;86:1475–1484
29. Jayalath VH, de Souza RJ, Sievenpiper JL, et al. Effect of dietary pulses on blood pressure: a systematic review and meta-analysis of controlled feeding trials. *Am J Hypertens* 2014;27:56–64
30. Venn BJ, Perry T, Green TJ, et al. The effect of increasing consumption of pulses and wholegrains in obese people: a randomized controlled trial. *Am Coll Nutr* 2010;29:365–372
31. Papanikolaou Y, Fulgoni VL III. Bean consumption is associated with greater nutrient intake, reduced systolic blood pressure, lower body weight, and a smaller waist circumference in adults: results from the National Health and Nutrition Examination Survey 1999–2002. *J Am Coll Nutr* 2008;27:569–576
32. Shai I, Schwarzfuchs D, Henkin Y, et al. Weight loss with a low-carbohydrate, Mediterranean or low-fat diet. *N Engl J Med* 2008;359:229–241