

Dry Beans in the Diet May Benefit People with Diabetes

By Sruti Chandrasekaran and Nanette Steinle, MD

Excess energy intake, high intakes of saturated and transfatty acids and high intakes of fiber-depleted refined grain foods have been proposed as factors contributing to the development of type 2 diabetes mellitus. Diets high in fiber, especially soluble fiber, are associated with an improvement in serum lipid, glucose, and insulin concentrations among obese individuals and those with type 2 diabetes.¹ Diets that include fruits, vegetables, whole grain cereals, dietary fiber, fish and polyunsaturated/ monounsaturated fatty acids may protect against the development of type 2 diabetes and improve measures of glucose homeostasis in both healthy subjects and those with the disease.¹⁻³

Type 2 diabetes is characterized by insulin resistance and hyperglycemia. Obesity is present in up to 70% of

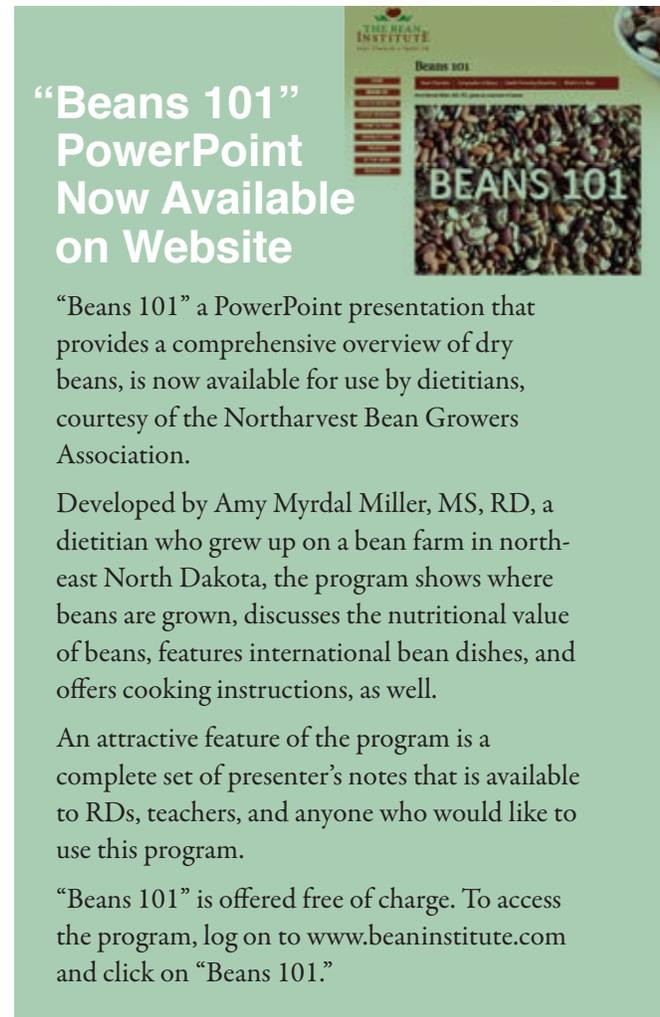
and mediating satiety signals in the central nervous system. Test meals including dry beans increase post prandial cholecystokinin.⁴ Postprandial rise in cholecystokinin has been associated with reduction of plasma glucose and insulin concentrations among individuals with diabetes.⁵ Including dry beans in the diet may benefit individuals with diabetes by promoting satiety, energy balance, and by moderating postprandial glucose and insulin levels.

High fiber diets reduce post prandial glucose levels, may improve insulin sensitivity, and reduce inflammation.⁴ One mechanism whereby postprandial glucose is improved by complex carbohydrate is thought to involve reduced carbohydrate absorption. Most legumes contain amylase inhibitors, thus reducing hydrolysis

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individuals with type 2 diabetes. Dietary factors that reduce obesity and improve insulin sensitivity are beneficial for individuals with diabetes. High fiber and protein rich foods, including dry beans, promote satiety by stimulating hormones such as cholecystokinin, a gut derived hormone involved in the regulation of gastric emptying

of carbohydrate.⁶ Amylase inhibition leads to reduced postprandial glucose and insulin levels, increased resistance of starch to digestion, and increased activity of colorectal bacteria. Dry beans are also rich in phytates, soluble fiber and tannins, all of which correlate inversely with carbohydrate digestion and glycemic response.⁷



**“Beans 101”
PowerPoint
Now Available
on Website**

“Beans 101” a PowerPoint presentation that provides a comprehensive overview of dry beans, is now available for use by dietitians, courtesy of the Northarvest Bean Growers Association.

Developed by Amy Myrdal Miller, MS, RD, a dietitian who grew up on a bean farm in northeast North Dakota, the program shows where beans are grown, discusses the nutritional value of beans, features international bean dishes, and offers cooking instructions, as well.

An attractive feature of the program is a complete set of presenter’s notes that is available to RDs, teachers, and anyone who would like to use this program.

“Beans 101” is offered free of charge. To access the program, log on to www.beaninstitute.com and click on “Beans 101.”



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partners play key roles in maintaining human health. Compositional changes in animal and human gut microbiota have been linked to obesity and diabetes.⁸ Host diet is one of the major determinants for the persistence of a given colonizing gastrointestinal bacterium^{9,10} and alterations in dietary constituents influence the composition of the gut micro biome, as well as the genes those microbes express.^{11,12} The unabsorbed starch from dry beans consists mainly of alpha-glucan molecules and oligo-saccharides, key fuels of health promoting bacteria in the gastrointestinal tract.¹³ One potential mechanism whereby dry beans benefit obesity and diabetes may be through altering the gut microbiome composition and their gene expression. Human studies addressing this question will provide important insights into the mechanisms whereby dry beans improve metabolic parameters in obesity and diabetes via altering gut microbial content and activity.

Long standing diabetes can lead to chronic kidney

problems and diabetic nephropathy. The pathogenesis of diabetic nephropathy is complex and dietary protein restriction appears to slow the progression of diabetic nephropathy.¹⁴ The acute effects of animal-compared with vegetable-protein meals in diabetic and control subjects are not very clear. Clinical observations led to the soy-protein hypothesis that substitution of soy protein for animal protein may result in reduced hyperfiltration, reduced urinary albumin excretion, and protection from diabetic nephropathy.^{15,16} Additionally, an increase in HDL cholesterol and reduced total-to-HDL cholesterol ratio and improved LDL-to-HDL cholesterol ratio results from dry bean consumption, factors that should be beneficial for type 2 diabetic patients at increased risk of developing cardiovascular disease.¹⁶ It is advisable therefore, that persons with diabetes moderate their animal protein intake and substitute vegetable protein for animal protein. A diet including soybeans, lentils, and legumes is a good alternative to animal protein.

Dry beans and legumes are ideally suited to meet major dietary recommendations for individuals with diabetes, including increased consumption of

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Dry Bean Quarterly is published four times a year by the Northarvest Bean Growers Association. An electronic version of this newsletter, with complete references, can be found at www.beaninstitute.com.

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Beans: Nutritional Information

(per 1 cup serving of cooked product)

Bean Variety	Calories	Protein	Fat	Carbs	Fiber	Calcium	Iron	Potassium
Fava Beans (<i>Broad beans</i>)	187 cal	12.92 g	0.68 g	33.40 g	9.2 g	61 mg	2.55 mg	456 mg
Lima Beans, canned	176 cal	10.10 g	0.72 g	33.06 g	13 g	70 mg	4.00 mg	706 mg
Mung Beans, canned	15 cal	1.75 g	0.07 g	2.67 g	0.16 g	18 mg	0.54 mg	34 mg
Navy Beans	258 cal	15.8 g	0.10 g	15.8 g	10 g	128 mg	4.5 mg	670 mg
Pinto Beans	235 cal	15.8 g	0.10 g	44 g	7 g	81 mg	4.5 mg	495 mg
Shellie Beans	74 cal	4.31 g	0.47 g	15.17 g	8.3 g	71 mg	2.43 mg	267 mg
Green Beans, Snap	36 cal	2 g	0.24 g	8.40 g	3.6 g	58 mg	2.16 mg	220 mg
Lima Beans	209 cal	11.58 g	0.54 g	40.19 g	9.0 g	54 mg	4.17 mg	969 mg
Adzuki Beans	294 cal	17.30 g	0.23 g	56.97 g	16.8 g	64 mg	4.60 mg	1,224 mg
Black Beans	227 cal	15.24 g	0.93 g	40.78 g	15.0 g	46 mg	3.61 mg	611 mg
Cranberry Beans	241 cal	16.53 g	0.81 g	43.29 g	17.7 g	88 mg	3.70 mg	685 mg
Great Northern Beans	209 cal	14.74 g	0.80 g	37.33 g	12.4 g	120 mg	3.77 mg	692 mg
Kidney Beans (<i>all varieties</i>)	225 cal	15.35 g	0.89 g	40.36 g	11.3 g	50 mg	5.20 mg	713 mg
Pink Beans	252 cal	15.31 g	0.83 g	47.17 g	9.0 g	88 mg	3.89 mg	859 mg
Chick Peas (<i>Garbanzo Beans</i>)	269 cal	14.53 g	4.25 g	44.97 g	12.5 g	80 mg	4.74 mg	477 mg

Source: <http://www.dietbites.com/Diet-2/beans-calories-nutrition-info.html>



Tuscan Ribollita

Recipe created by
The Culinary Institute of America

Ribollita is a classic Tuscan dish, a celebration of beans, seasonal vegetables, and the first press of extra virgin olive oil. The addition of bread turns a light soup into a satisfying dish that can be served as a main course. Grating a few teaspoons of aged, nutty Parmesan cheese over the top and drizzling a bit more olive oil adds another layer of flavor, complexity and richness to a very healthful, vegetarian dish.

Ingredients

- 2 cups dry cranberry or pinto beans*
- 2 bay leaves
- 4 garlic cloves
- 1 stalk of celery, chopped
- 2 medium carrots, chopped
- 1 medium white (not sweet) onion, chopped
- ¼ cup extra virgin olive oil
- ½ head Savoy cabbage, cored and chopped
- 1 bunch Swiss chard (or kale), stemmed and chopped
- 5 cups water
- ½ teaspoon kosher salt
- ½ teaspoon freshly cracked black pepper
- 6 slices Italian bread, torn into pieces
- 6 teaspoons extra virgin olive oil (for drizzling over the top of each bowl of soup)
- ¼ cup freshly grated Parmesan cheese



PREPARATION

1. In a large pot cover the beans with water and soak them overnight.
2. Drain the soaking liquid, cover the beans with water, and cook the beans with the bay leaves and 2 of the garlic cloves over medium heat until they are soft, about 60 to 90 minutes. Strain the beans, reserving 1 cup of the liquid to add to the soup.
3. In a food processor, shred the remaining 2 cloves of garlic with the celery, carrot, and onion until very fine. You want tiny pieces of the vegetables, not a purée.
4. Sauté the vegetables in ¼ cup of extra-virgin olive oil on medium-low heat, about 10 minutes, or until they are fragrant and slightly colored.
5. Add the cooked beans and the 1 cup cooking water, cabbage, chard (or kale), and water. Bring to a simmer and cook for approximately one hour. Season with salt and pepper.
6. Crumble the stale bread into small chunks and place a handful of the bread in each bowl. Ladle the soup over it and let it sit for a few minutes for the bread to soften and the broth to be absorbed. Finish each bowl with a teaspoon of extra virgin olive oil and a few teaspoons freshly grated Parmesan.

***Note:** You can use pinto beans in place of cranberry beans, and you can use canned, drained and rinsed beans in place of dry beans. Use 6 cups canned beans in place of the 2 cups of dry beans, omit step 1, and add 1 additional cup of water in step 3.

YIELD:

6 servings

SERVING SIZE:

2 cups

NUTRIENT INFORMATION PER SERVING:

Calories: 480, total fat: 17g, saturated fat: 3g, monounsaturated fat: 10g, polyunsaturated fat: 2g, cholesterol: 3mg, protein: 21g, carbohydrate: 65g, dietary fiber: 20g, sodium: 512mg, potassium: 1320mg

(Analysis based on using dry cranberry beans. If canned beans are used, the total sodium content per serving will be slightly higher.)



Dry Beans in the Diet May Benefit People with Diabetes *continued from pg. 2*

complex carbohydrates and decreased fat. Legumes supply vital nutrients to the diet, yet are low in fat and sodium and contain no cholesterol. Legumes are also a cost effective ingredient in sustaining human nutrition. 

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