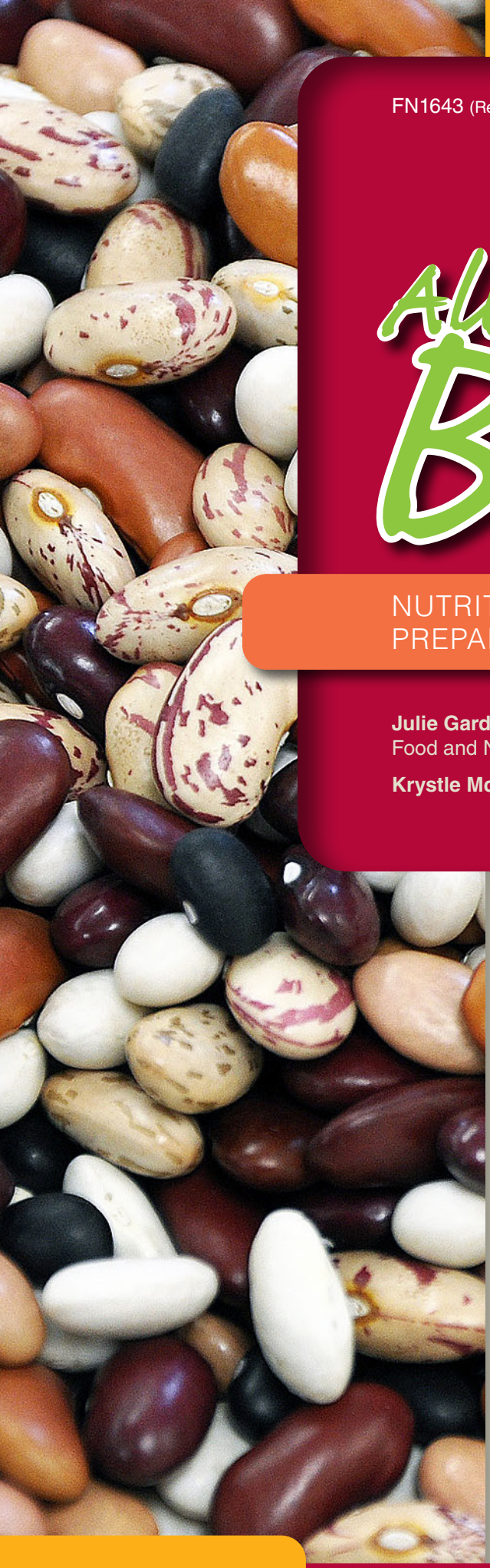

FN1643 (Revised January 2024)

All About Beans

NUTRITION, HEALTH BENEFITS, PREPARATION AND USE IN MENUS

Julie Garden-Robinson, Ph.D., R.D., L.R.D.
Food and Nutrition Specialist

Krystle McNeal, R.D., Program Assistant (former)

Beans are among the most versatile and commonly eaten foods throughout the world, and many varieties are grown in the U.S. Because of their nutritional composition, these economical foods have the potential to improve the diet quality and long-term health of those who consume beans regularly [1, 2, 3].

This publication provides evidence-based nutrition and health information about beans, preparation tips, sample recipes and references for further study.

NDSU | EXTENSION

North Dakota State University
Fargo, North Dakota

Nutrient-rich Beans

Dry edible beans, such as pinto, navy, kidney, pink and black beans, are part of the legume family. A legume plant produces seeds in a pod; dry beans are the mature seeds within these pods. Other members of the legume family include lentils, peas, chickpeas, peanuts and soybeans [4].

As shown in Tables 1 and 2, dry edible beans are nutrient-rich foods; they contain a variety of vitamins, minerals and other nutrients while providing a moderate amount of calories. Beans provide protein, fiber, folate, iron, potassium and magnesium while containing little or no total fat, trans fat, sodium and cholesterol [5, 6]. Because of their high concentration of health-promoting nutrients, consuming more beans in the American diet could improve overall health and also decrease the risk of developing certain diseases, including heart disease, obesity and many types of cancers. The 2020-2025 Dietary Guidelines for Americans recommend consuming 3 cups of legumes, including beans, per week to take advantage of these potential health benefits [7].

Fiber Booster

Nutrition experts recommend that adults consume 25 to 38 grams (g) of dietary fiber per day (14 g per 1,000 calories); however, the majority of Americans do not reach this recommendation consistently [7]. Dietary fiber intake contributes to feelings of fullness or satiety and helps maintain functioning of the digestive system [7, 9]. Beans are a rich source of soluble and insoluble fiber. On average, beans provide 7 or more grams of total dietary fiber per ½-cup serving [6]. The consumption of fiber also has been associated with decreasing total and low-density lipoprotein (LDL) cholesterol, as well as decreasing the risk for developing coronary heart disease, metabolic syndrome, stroke, hypertension, diabetes, obesity and some gastrointestinal diseases [9, 10, 11, 12].

Full of Folate

The B vitamin folate is found prominently in beans [13]. Folate, or its synthetic counterpart, folic acid, is essential for the production of red blood cells in the human body and development of an embryo's nervous system during the early stages of pregnancy. Adequate intake of folic acid has been shown to reduce the risk of neural tube defects significantly in newborns [13]. Synthetic folic acid is better absorbed in the body than naturally occurring folate. Some folate can be lost from dry beans and other legumes during the soaking and cooking process or can be reduced when the vitamin interacts with other food components, such as fiber [14, 15]. Quick-soaking beans (boiling beans for a short time and then soaking for one hour) may lead to more folate losses than a more traditional long soak. In general, to maximize the natural folate content in beans, some researchers suggest using the slow-soak method and a cooking method that prepares the beans in 150 minutes or less [14].

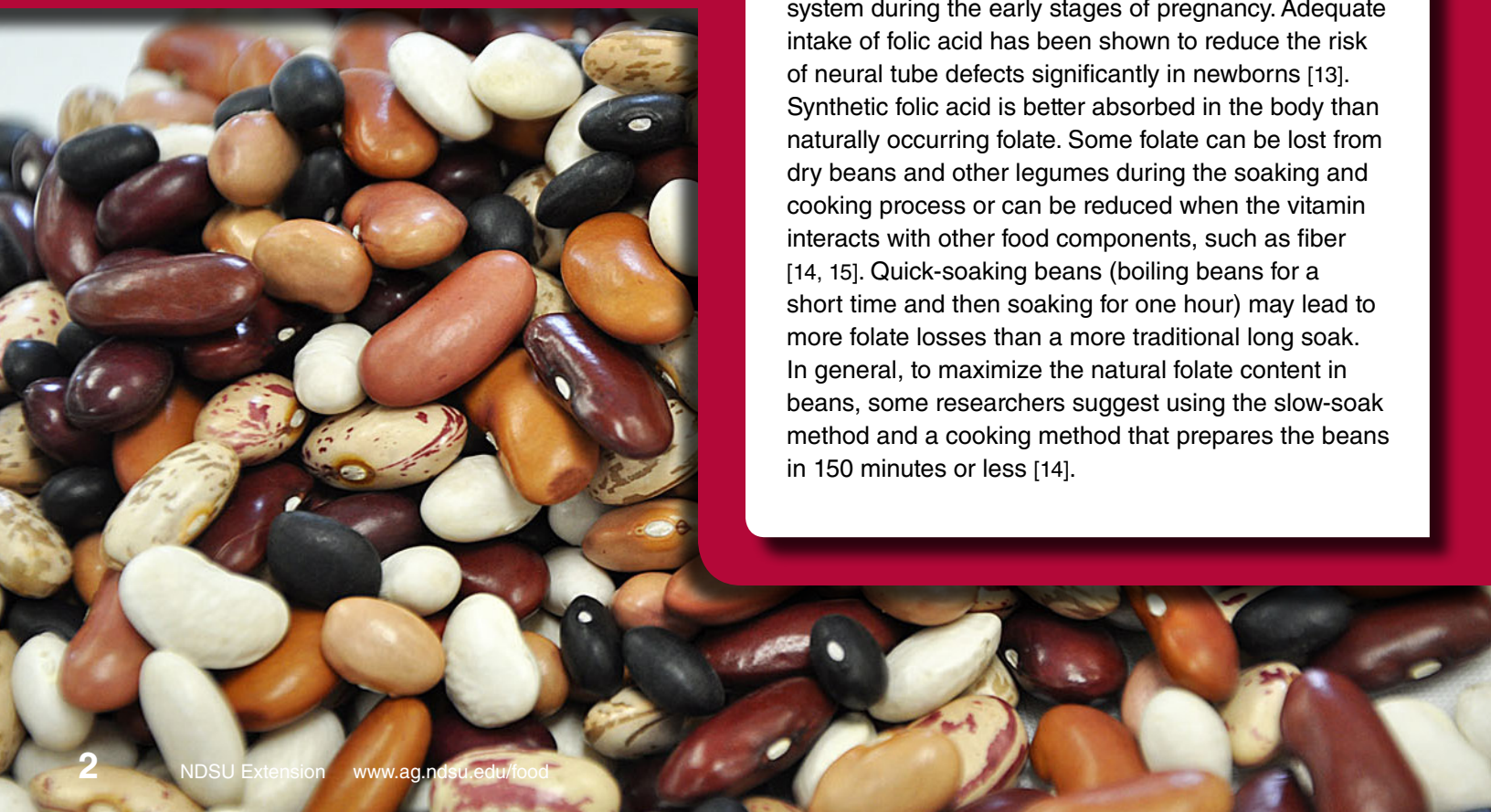

Table 1. Nutrient content of selected beans compared with recommendations on food labels.*

	Calories (kcal)	Total Fat (g)	Saturated Fat (g)	Trans Fat (g)	Cholesterol (mg)	Sodium (mg)	Total Carbohydrate (g)	Fiber (g)	Protein (g)
Daily Values (DV) used on Nutrition Facts labels	**2,000**	**Less than 65**	**Less than 20**	**Minimize in diet**	**Less than 300**	**Less than 2,400**	**300**	**25**	**50**
Black	114	0.5	0.1	0	0	1	20.4	7.5	7.6
Cranberry	120	0.4	0.1	0	0	1	21.7	8.8	8.3
Great Northern	104	0.4	0.1	0	0	2	18.7	6.2	7.4
Navy	127	0.6	0.1	0	0	0	23.7	9.6	7.5
Pink	126	0.4	0.1	0	0	2	23.6	4.5	7.7
Pinto	122	0.6	0.1	0	0	1	22.4	7.7	7.7
Red Kidney	112	0.4	0.1	0	0	2	20.2	6.5	7.7

Table 2. Vitamin and mineral content of selected beans compared with recommendations on food labels.*

	Vitamin A (IU)	Vitamin C (mg)	Folate (mcg_DFE)	Calcium (mg)	Iron (mg)	Potassium (mg)	Magnesium (mg)
Daily Values (DV) used on Nutrition Facts labels	**5,000**	**60**	**400****	**1,000**	**18**	**4,700**	**400**
Black	5	0	128	23	1.8	305	60
Cranberry	0	0	183	44	1.9	342	44
Great Northern	1	1.2	90	60	1.9	346	44
Navy	0	0.8	127	63	2.2	354	48
Pink	0	0	142	44	1.9	429	55
Pinto	0	0.7	147	39	1.8	373	43
Red Kidney	0	1.1	115	25	2.6	357	40

Sources: Food and Drug Administration; U.S. Department of Agriculture Agricultural Research Service [6, 8].
* All nutrient values per 1/2 cup cooked beans without added salt.
** 400 mcg DFE/day is recommended dietary allowance (RDA) for adult men/women (not pregnant or lactating).

Eating More Beans May Reduce Disease Risk Factors

Heart Disease

Elevated blood levels of triglycerides and cholesterol, especially LDL cholesterol, are significant contributing factors to heart disease [18]. High plasma levels of homocysteine have been associated with increased risk for cardiovascular disease. Although some studies have shown that folate may lower homocysteine levels and, therefore, heart disease risk, the topic remains controversial and more research is needed [16, 17].

A varied diet low in saturated fat with ample fiber (especially soluble) and B vitamins is among the recommendations for reducing cardiovascular disease risk factors [18]. Several studies have shown that regular consumption of beans can help lower total and LDL cholesterol and other risk factors for heart disease [19, 20, 21, 22, 23, 24, 25]. One study showed a 38% lower risk of nonfatal heart attack when ⅓ cup of cooked beans was consumed daily [22]. Other researchers reported significant reductions in blood cholesterol levels when canned beans were consumed on a daily basis [19, 24].

In an eight-week study, researchers evaluated the influence of daily consumption of ½ cup of pinto beans, black-eyed peas and carrots on blood cholesterol levels. Among participants consuming ½ cup of pinto beans per day, total and LDL cholesterol levels decreased by more than 8%. Participants consuming black-eyed peas or carrots did not experience a significant change in total or LDL cholesterol. Pinto beans and other dry edible beans contain significantly more dietary fiber (specifically soluble fiber) than black-eyed peas and carrots, likely resulting in this decrease in cholesterol [25].

Diabetes

Diabetes is becoming more prevalent throughout the world as the global obesity epidemic continues. Eating a variety of legumes, including beans, may be valuable not only in the prevention of diabetes but also in the management of blood sugar levels [26]. Beans are rich in complex carbohydrates (such as dietary fiber), which are digested slowly. As a result, bean consumption has been shown to increase feelings of fullness and help regulate plasma glucose and insulin levels after meals [27]. Legume fiber was among the fiber types associated with reducing risk for metabolic syndrome, which includes glucose disturbances and increased risk of diabetes [28].

According to a recent study, regularly consuming beans as part of a low-glycemic-index diet improved blood glucose management, reduced systolic blood pressure and decreased risk of coronary heart disease [29]. Participants with Type 2 diabetes mellitus were placed randomly on a high-legume diet (consuming 1 cup per day) or on a high-insoluble-fiber diet with whole-wheat foods. Hemoglobin A1c (HbA1c), a measure of long-term glycemic control, was measured after three months. The group consuming the high-legume diet experienced a significant decrease in HbA1c and reduced their calculated heart disease risk scores [29].

Cancer

The role of bean-containing diets related to cancer risk has been the subject of ongoing studies [30]. Eating beans may reduce the risk for developing certain types of cancers due to their contribution of bioactive compounds to the diet, including flavonoids, tannins, phenolic compounds and other antioxidants [31]. These compounds act to decrease the risk of cancer as well as other chronic diseases. Other researchers have shown that beans may have a synergistic effect when consumed in a diet containing other antioxidant-rich foods (such as fruits and vegetables) by decreasing oxidation in the body and reducing the overall cancer risk [32].

Bean intake has been associated with a decreased risk of breast, stomach, colorectal, kidney and prostate cancers in human and animal studies [33, 34, 35, 36, 37, 38, 39]. In particular, the dietary fiber content of beans may play a role in reducing the risk of colorectal cancers [36]. For example, a study that examined the impact of dietary fiber intake on the development of colon polyps in a cancer survivor cohort found that people who consumed more fiber, specifically fiber from legumes and cooked green vegetables, including green beans and peas, were less likely to show a recurrence of polyps than others [36].

Beans, Color and Antioxidants

Beans are high in natural antioxidants [40]. The color of the bean coat appears to affect the antioxidant capacity because this correlates with total phenolic content of the bean. Colored beans (red, brown or black) possess greater antioxidant activity than white beans [41]. Furthermore, some of these antioxidant compounds are lost during typical preparation and cooking methods, although significant amounts of antioxidants still remain [42].

Obesity and Overweight

Even though beans are not often promoted as a weight-loss food, regularly consuming nutrient-rich legumes may impact weight loss or management, although more research is needed [43, 44, 45, 46]. According to results from the National Health Nutrition Examination Survey 1999 to 2002, people who consumed beans regularly had a lower body weight, lower waist circumference and lower systolic blood pressure in addition to a greater intake of dietary fiber, potassium, magnesium, iron and copper [43]. According to the results of studies conducted in Brazil, a traditional diet high in rice and beans was associated with a lower body mass index (BMI) compared with a typical Western diet containing more fat, snacks and soda [47, 48].

Consuming beans may contribute to feelings of short-term satiety as a result of the beans' fiber and protein content [49]. In a study of 35 obese men fed four different protein-rich diets, the diet providing the majority of protein from legumes (including beans) induced the greatest amount of weight loss in an eight-week period. The group instructed to eat legumes at least four days a week also experienced significant reductions in waist circumference, body-fat mass, blood pressure and total cholesterol when compared with the other groups [50].

Researchers have studied the role of hormones, including leptin and ghrelin, in regulating appetite and weight. Researchers determined the leptin and ghrelin levels in 36 insulin-sensitive and 28 insulin-resistant men. Leptin levels decreased among the group consuming a diet enriched with legumes. When leptin is present in smaller concentrations, it is more effective in regulating appetite and may aid in weight loss and weight maintenance [51].

Bean Benefits for Children

Childhood obesity is a continuing concern in North America and around the world, reaching epidemic proportions. Many strategies have been suggested to prevent and treat obesity during the childhood years, usually focusing on restricting caloric intake. Some have suggested that emphasizing plant-based foods, especially fruits and vegetables, in children's diets would help prevent obesity [52]. Incorporating beans into the diet of children can help them maintain healthy weights as well as promote overall health.

Most children do not consume the recommended amount of dietary fiber in their diets [7]. Because of the role fiber plays in satiety, inadequate fiber intake may contribute greatly to overeating empty-calorie foods and weight gain [9]. The U.S. Department of Agriculture recognizes the health benefits beans offer children and now requires that students from kindergarten through 12th grade be offered at least ½ cup of beans per week as part of new guidelines for school meals [53].

Beans in Special Diets

An increasing number of people are following special diets, such as vegetarian, vegan and gluten-free diets. While each special diet has different requirements, a common factor among them is that certain foods that normally would provide vital nutrients are eliminated. Beans can play a role in providing a variety of nutrients for individuals following these diets.

Gluten-free

People with celiac disease should consume a diet that is free of gluten, a protein found in many grain products. They must eliminate these products from their diet, which increases the risk for deficiencies in several B vitamins and other nutrients that typically are found in grains [54]. Beans are a naturally gluten-free food, and they provide many of the same vitamins and minerals often found in enriched grain products, including thiamin, riboflavin, folate, iron and fiber. Bean flour may be particularly beneficial to those following gluten-free diets because bean flours can be combined with other gluten-free flours (such as rice or tapioca flour).

Vegan/Vegetarian

Those following vegetarian or vegan diets depend on plant foods to provide important nutrients often found in animal products, such as protein, iron and zinc. While vegetarians may consume dairy or eggs, those following a vegan diet consume no animal-based products. Those following a vegan diet may eat less saturated fat and cholesterol, and more dietary fiber; however, those following a vegan diet may be lacking in vitamin B12, vitamin D, calcium or omega-3 fats unless they consume appropriate supplements [55]. Beans can be a valuable part of any plant-based diet because they are rich in several nutrients and serve as a meat alternative and contain the full complement of amino acids when paired with grains.

Budget-friendly Beans

As shown in Table 3, beans provide a variety of nutrients at a relatively low cost compared with other protein-rich foods [56]. According to the Nutrient Rich Foods Index, a tool that scores foods based on their nutrient content that then can be compared to food price databases, beans and legumes are among the best foods in terms of amount of nutrients per unit price [5].

The cost is shown for a 4-ounce raw portion of meat/poultry, which typically results in a 3-ounce cooked portion.

Table 3. Cost comparison of protein-rich foods in American diet.

Protein food	Serving size	Cost per serving ($)
Ground beef (lean, extra-lean)	4 ounces	1.18
Beef (round roast, USDA choice, boneless)	4 ounces	1.16
Pork chop (boneless)	4 ounces	1.00
Chicken breast, boneless	4 ounces	0.82
Pinto beans (canned, drained)	½ cup	0.19
Eggs, grade A, large	1	0.16
Pinto beans (cooked, dry)	½ cup	0.07

U.S. Department of Agriculture. Economic Research Service. Retail data for beef, pork, poultry cuts, eggs and dairy products. Retrieved on March 15, 2013, from www.ers.usda.gov/data/meatpricespreads/

Bean Market Classes and Cooking Time

Numerous bean market classes are available in the U.S. and throughout the world. While different beans do not vary greatly in nutrient content, they do differ slightly in taste, texture and cooking times. The following chart describes nine of the most common beans found in American grocery stores and lists some common cuisines using beans. The cooking time refers to the amount of time to cook dry beans.

		Cooking time
	**Black beans** are medium-sized, oval-shaped beans with matte black skin. They also are called turtle beans. They are sweet-tasting with a soft texture. They are popular beans in Central American, South American and Caribbean cuisine.	60 to 90 minutes
	**Cranberry beans** are medium-sized, oval-shaped beans with mottled tan and red skin. They also are called Roman beans. Cranberry beans are known for their creamy texture with a flavor similar to chestnuts. The red specks disappear when these beans are cooked. Cranberry beans are a favorite in northern Italy and Spain.	45 to 60 minutes
	**Great Northern beans** are medium-sized, oval-shaped beans with thin white skin. They have a delicate flavor. Great Northern beans are popular in France for making cassoulet (a white bean casserole) and in the Mediterranean, where many beans of a similar appearance are cultivated.	45 to 60 minutes
	**Dark red kidney beans** are large, kidney-shaped beans with a deep, glossy red skin. They have a firm texture and hold up well in soups or other dishes that cook for a long time. Dark red kidney beans are used in soups, cold bean salads and chili. Both dark and light red kidney beans are used to make Louisiana Red Beans and Rice.	90 to 120 minutes
	**Light red kidney beans** are large, kidney-shaped beans with light red/pink glossy skin. They have a firm texture and hold up well in soups or other dishes that cook for a long time. Light red kidney beans are popular in the Caribbean region, Portugal and Spain. Dark and light red kidney beans are used to make Louisiana Red Beans and Rice.	90 to 120 minutes
	**Navy beans** are small, oval-shaped beans with white skin. They have a delicate flavor. These are the beans used for the famous Boston Baked Beans. These white beans were named navy beans because of their inclusion in the U.S. Navy diet during the second half of the 19th century.	90 to 120 minutes
	**Pink beans** are small, oval-shaped beans with a pale pink skin. Pink beans are popular in Caribbean countries. They are used to make Caribbean Pink Beans, a dish made with no added fat and flavored with sofrito, a mixture of tomatoes, bell pepper, onions and garlic.	60 minutes
	**Pinto beans** are medium-size, oval-shaped beans with mottled beige and brown skin. Like cranberry beans, pinto beans lose their mottled appearance when cooked. Pinto beans are the most widely produced bean in the U.S. and one of the most popular in the Americas. Pinto beans are used to make Mexican refried beans.	90 to 120 minutes
	**Small red beans** are small, oval-shaped beans with red skin. They have a more delicate flavor and softer texture compared with kidney beans. Small red beans are particularly popular in the Caribbean region, where they normally are eaten with rice.	60 to 90 minutes

Source of chart: www.beaninstitute.com

Preparing Dry Beans

Dry beans offer nutrition, health and economic benefits. However, you need to follow certain steps to ensure dry beans are cooked properly. The four basic steps are 1) clean, 2) rinse, 3) soak and 4) cook. The first two steps simply involve removing any broken beans or foreign objects from beans, and then rinsing them in a colander under cold running water.

Comparing Soaking Methods

The three different soaking methods vary in the amount of time required for adequate soaking. The "hot soak" method typically is recommended because it reduces cooking time and gas-producing compounds the most while consistently yielding tender beans.

Traditional Soak	Hot Soak (preferred)	Quick Soak
1. Pour cold water over beans to cover.	1. Place beans in a large pot and add 10 cups of water for every 2 cups of beans.	1. Place beans in a large pot and add 6 cups of water for every 2 cups of beans.
2. Soak beans for eight hours or overnight.	2. Heat to boiling and boil for two to three minutes.	2. Bring to boil and boil for two to three minutes.
3. Drain beans and discard soak water.	3. Remove beans from heat, cover and let stand for four to 24 hours.	3. Remove beans from heat, cover and let stand for one hour.
4. Rinse beans with fresh, cool water.	4. Drain beans and discard soak water.	4. Drain beans and discard soak water.
	5. Rinse beans with fresh, cool water.	5. Rinse beans with fresh, cool water.
Advantages: No boiling required; reduces gas-producing compounds with long soak	**Advantages:** Reduces cooking time and gas-producing compounds; consistently yields tender beans	**Advantages:** Much faster soaking time, requires less planning
Disadvantages: Long soaking time, requires planning ahead of time	**Disadvantages:** Long soaking time, requires some planning	**Disadvantages:** Fermentation may take place if left in hot water for too long; potential loss of some folate

4 Steps to Soaking Dry Beans

2 cups of dry beans = 4 to 5 cups of cooked beans

1. First, inspect the dry beans, removing any broken beans or foreign materials.
2. Rinse thoroughly in cold water.

   Next, use
3. the preferred "hot soak" method: Add 10 cups of cold water to the pot for each pound (2 cups) of beans. Bring the water to a boil and boil for two to three minutes. Cover the pot. Let stand. A four-hour soak is ideal.
4. Finally, drain and rinse soaked beans. Cook and use in recipes.

Top 10 Tips for Cooking Dry Beans

1 To cook soaked beans, add fresh, cold water to fully cover beans, plus 1 to 2 tablespoons of oil, if you wish. Adding oil prevents foaming and boiling over. Foam also can be skimmed off during cooking. Simmer the beans until they are tender.

2 Cook only one kind of bean at a time if possible. Different types and ages of beans have different cooking times, so avoid cooking different types of beans together at the same time.

3 Maintain water at a gentle simmer (not rapid boil) during cooking to prevent split skins.

4 Do not add baking soda to beans at any time. This will make the beans more tender but destroys the B vitamin thiamine and also may impact the flavor negatively.

5 Stir beans occasionally to prevent sticking during cooking.

Note: Hard water (naturally high in minerals) may affect cooking time/softening of beans. Distilled or softened water may result in a better end product.

6 Keep beans covered with water during the cooking process. Add cold water periodically during cooking to ensure beans are covered.

7 Check beans for doneness before eating. When cooked properly, beans should be tender but not mushy. Skins still should be intact, but the bean can be mashed easily between two fingers or with a fork.

8 Drain beans immediately after they have reached desired texture to prevent overcooking.

9 To add flavor after beans have finished cooking, try adding a drizzle of extra virgin olive oil immediately before serving rather than adding high-fat ingredients (such as bacon) during cooking. (See “Flavor-boosting Tips” on p. 10.)

10 To cook beans quickly, try a pressure cooker, following the manufacturer’s instructions. This allows beans to cook in half the time and eliminates the need for soaking. However, this does not give the beans much time to absorb flavors from other ingredients. Therefore, use a pressure cooker when beans are needed quickly or to be used as a part of another flavorful dish.

Beans, Beans: Gas-reducing Tips

Consumption of nutrient-rich beans could decrease the risk for several chronic diseases; however, some people may be hesitant to increase beans in their diet due to the fear of intestinal gas and stomach discomfort, including increased flatulence. Certain nondigestible carbohydrates, termed oligosaccharides, are responsible. Some researchers have reported that flatulence associated with bean intake may be exaggerated, and individuals vary in their response to increased fiber intake [57]. Researchers suggest discarding the soaking and cooking water to remove some of these nondigestible carbohydrates [58].

Try these tips to reduce the occurrence of intestinal gas when eating beans:

- Increase beans in your diet slowly. For example, you may start by eating 2 to 4 tablespoons of beans per day, and gradually increase each day.
- Drink more water each day as you eat more beans (or other fiber-containing foods).
- Use the hot soak method when preparing dry beans. The longer beans soak, the more the amounts of the gas-producing compounds will be reduced.
- Change the water several times when soaking dry beans, and discard this water when soaking is completed. Many of the gas-causing carbohydrates are released into this soaking water.
- Rinse canned beans without sauce (such as kidney, navy, Great Northern) before eating or using in recipes.
- Consider using a gas-reducing enzyme tablet. These tablets are available over the counter in many pharmacies.

Flavor-boosting Tips

Beans tend to absorb the flavors of the ingredients with which they are cooked. However, take care to ensure that these added foods only increase flavor and do not hinder texture development. Follow these tips when adding each of these ingredients to beans to make them delicious and nutritious:

- **Acid:** Adding sources of acid is a great way to increase the depth of flavor in bean dishes. Add foods such as lemon juice, vinegar, tomatoes, chili sauce, ketchup, molasses or wine after beans have been cooked fully. These acidic foods can prevent beans from becoming tender and lengthen cooking time if they are added too soon.
- **Onions:** Adding onions also can increase the depth of flavor in beans. Add onions any time during the cooking process, but for a stronger onion flavor, add during the last 30 minutes of cooking.
- **Herbs and spices:** Add oregano, thyme, garlic, parsley or any other herbs/spices any time during cooking. However, keep in mind that flavors of herbs and spices tend to diminish the longer they are cooked.
- **Salt:** Add when the beans are almost tender because salt tends to toughen beans. Remember to use minimal amounts of salt to limit the sodium content of beans.

On the Menu: Beans!

How do you start eating more beans and reaping the many health benefits? Adding more beans to your daily diet can be as easy as adding them to the foods you already enjoy. Beans have a neutral flavor. Try some of the recipes included at the end of this publication. Here are a few ideas for adding beans to your diet:

- **Main dishes:** Add beans to chili, burgers and rice for a satisfying entrée. Or try replacing the meat in recipes with beans, such as a bean enchilada or black bean and cheese quesadilla.
- **Side dishes:** Baked beans or a bean salad make a great addition to any meal.
- **Salads:** Add beans to salads for added nutrition, color and texture.
- **Pasta:** Adding beans to pasta dishes will provide another dimension of flavor and boost the appearance of the dish.
- **Soup:** Pureed beans can be used to replace cream or higher-fat ingredients.
- **Dips and spreads:** Bean dips and spreads make a great snack or appetizer.
- **Baked goods:** Replace all or part of the fat ingredients with mashed or pureed beans in foods such as brownies and cookies. Beans will give the baked items additional protein and fiber and reduce fat, cholesterol and calories.

Beans in Baked Goods

Research has shown that pureed beans can be used to replace up to 50% of the fat in brownie recipes and still yield an acceptable end product [59]. Bean flours also are used in grain products, such as tortillas. Up to 25% of wheat flour in tortillas can be replaced with bean flours, which yield a tortilla with similar texture, appearance and flavor while improving the overall nutrient profile [60].

Decreasing Sodium in Canned Beans

Consuming a diet high in sodium is linked to the development of hypertension and increased risk for heart disease. Canned vegetables, including canned beans, contain higher amounts of sodium than their fresh or less-processed counterparts. However, these beans still contain all of the valuable nutrients as their dry counterparts and can be part of a healthy diet.

To reduce the sodium content in canned beans, simply drain and rinse them before consuming or adding to recipes. Researchers reported that draining canned beans reduces sodium content by 36%, while draining and rinsing canned beans reduces the sodium content by 41% [61].

Recipes

Key to abbreviations

c. = cup(s)
lb. = pound(s)
Tbsp. = tablespoon(s)
tsp. = teaspoon(s)
pkg. = package(s)
g = gram(s)
oz. = ounce(s)
mg = milligram(s)

You may note variations in the weights of the canned products you purchase. A slight difference in the amount of ingredients you add will not affect the overall quality of these recipes.

Recipes were analyzed using Food Processor SQL software.

Beans can be used interchangeably in these recipes. Soaked, cooked beans prepared according to the directions provided can be used in place of drained, rinsed canned beans.

NDSU Extension

Arriba Nacho Dip

2 cloves garlic, finely chopped
1 c. onion, finely chopped
1 c. green bell pepper, finely chopped
½ jalapeno pepper, finely chopped
3 large Roma tomatoes, chopped
¼ c. cilantro, finely chopped
¼ c. lemon juice
1 (15-oz.) can fat-free refried beans
4 oz. reduced-fat cheddar cheese, shredded

Make salsa by combining the first seven ingredients in a bowl; mix to combine. Put refried beans and salsa in a pot; stir until blended. Cook on low to medium heat for 20 minutes. Add cheese and allow to melt on top. Serve with tortilla chips or veggies.

Makes 12 servings. Per serving: 60 calories, 0.5 g fat, 4 g protein, 8 g carbohydrate, 2 g fiber and 230 mg sodium

NDSU Extension

Black Bean and Fruit Salsa

½ c. mango, peeled and cubed
1 c. papaya, peeled and diced
½ c. pineapple, diced
½ c. black beans, canned, drained and rinsed
1 Tbsp. cilantro, minced
1 Tbsp. lime juice (fresh-squeezed for best flavor)
1 Tbsp. extra-virgin olive oil
1 tsp. cumin
¼ tsp. black pepper
1 clove garlic, minced

Combine all ingredients in a large bowl; toss gently to coat.

Makes eight servings. Per serving: 40 calories, 2 g fat, 0 g protein, 6 g carbohydrate, 1 g fiber and 0 mg sodium

NDSU Extension

Mediterranean Bean Salad

1 (15.5-oz.) can beans (Great Northern, navy or white kidney), drained and rinsed
½ c. sun-dried tomatoes, cut into strips
⅓ c. black olives, drained and chopped
⅓ c. fat-free or reduced-fat feta cheese, crumbled
⅓ c. red onion, finely chopped
2 cloves garlic, finely minced
2 Tbsp. fresh cilantro, chopped
2 Tbsp. olive oil
2 Tbsp. lemon juice
Fresh ground pepper

Drain and rinse beans. Combine all ingredients in a bowl and mix thoroughly. Serve on a lettuce leaf with grilled flat bread, tossed with pasta, in a pita pocket sandwich, on top of tossed salad or with whole-grain chips or crackers.

Makes six servings. Per serving: 150 calories, 7 g fat, 5 g protein, 16 g carbohydrate, 5 g fiber and 200 mg sodium

NDSU Extension

Sizzlin' Baked Beans

1 (28-oz.) can vegetarian baked beans, undrained
½ green pepper, chopped
½ red pepper, chopped
1 onion, chopped
1½ Tbsp. molasses
1½ Tbsp. ketchup
4 strips uncooked turkey bacon, diced
Salt and pepper to taste

In a 9- by 13-inch greased pan, mix all ingredients, except turkey bacon. Brown turkey bacon and drain fat. Crumble and sprinkle turkey bacon evenly over the top. Bake in preheated oven at 350 F for 40 minutes.

Makes 12 servings. Per serving: 100 calories, 1.5 g fat, 5 g protein, 19 g carbohydrate, 4 g fiber and 360 mg sodium

NDSU Extension

Three-Bean Pasta Salad

8 oz. whole-grain pasta
1 (15.5-oz.) can three-bean salad, chilled
2 c. grape tomatoes
1 tsp. dried dill weed

Cook pasta according to package directions. Drain. Rinse with cold water and place in a medium-sized bowl. Add undrained three-bean salad, tomatoes and dill. Mix gently, cover and chill.

Makes six servings. Per serving: 110 calories, 0 g fat, 5 g protein, 25 g carbohydrate, 4 g fiber and 280 mg sodium

NDSU Extension

Turkey and Bean Chili

1 Tbsp. olive oil
1 yellow or white onion, chopped
1 green bell pepper, chopped
2 cloves garlic, chopped
½ lb. ground turkey
2 Tbsp. tomato paste
1 tsp. ground cumin
2 tsp. chili powder
1 (28-oz.) can diced tomatoes
2 (15-oz.) cans beans (kidney, small red, pink), drained and rinsed
½ c. water
1¼ tsp. salt
¼ tsp. pepper
¼ c. reduced-fat sour cream
Cilantro sprigs, for serving

Heat oil in a large saucepan over medium-high heat. Add onion, bell pepper and garlic. Cook, stirring occasionally, just until vegetables are tender. Add turkey and cook, breaking up with a spoon, until no longer pink. Stir in tomato paste, cumin and chili powder. Cook and stir for one minute. Add tomatoes (with liquid), beans, water, 1¼ tsp. salt and ¼ tsp. pepper. Bring to a boil. Reduce heat and simmer, stirring occasionally, until slightly thickened, 12 to 15 minutes. Serve with sour cream and cilantro.

Makes eight servings. Per serving: 170 calories, 3 g fat, 13 g protein, 23 g carbohydrate, 7 g fiber and 300 mg sodium

NDSU Extension

Stuffed Peppers

4 medium bell peppers, any color
½ medium onion, chopped
2 c. corn (fresh or frozen)
2 small tomatoes, chopped
2 (15.5-oz.) cans black beans, drained and rinsed
2 tsp. olive oil
1 tsp. cumin
½ tsp. cayenne pepper
1 garlic clove, minced
2 tsp. cilantro, finely chopped
1 c. shredded reduced-fat cheddar cheese (try pepperjack for more spice)

Rinse peppers and cut in half lengthwise; remove seeds. Place peppers in a large pot and cover with water. Bring to a boil, reduce the heat, cover and simmer for five minutes; drain. Set pepper halves on greased baking sheet. Preheat oven to 350 F. In a small skillet, sauté the chopped onion in olive oil until tender.

Mix together onions, tomatoes, corn and black beans in a medium-sized bowl. In a small bowl, combine oil and seasonings; add to vegetable mixture and mix thoroughly. Fill pepper halves with mixture and top with cheese. Bake for eight to 10 minutes or until cheese is melted.

Makes eight servings. Per serving: 130 calories, 2 g fat, 7 g protein, 26 g carbohydrate, 7 g fiber and 240 mg sodium

NDSU Extension

Chocolate Chip Bean Muffins

2 (15.5-oz.) cans beans (Great Northern, navy, white kidney), drained and rinsed
⅓ c. low-fat milk
1 c. sugar
¼ c. butter or margarine
3 eggs
3 tsp. vanilla extract
1 c. all-purpose flour
½ c. whole-wheat flour
1 tsp. baking soda
½ tsp. salt
¾ c. semisweet chocolate chips

Combine beans and milk in a food processor or blender until smooth. Mix sugar and butter or margarine in a large bowl; beat in eggs and vanilla. Add bean mixture, mixing until well blended. Mix in flours, baking soda and salt. Add in chocolate chips. Spoon mixture into 16 greased or paper-lined muffin tins about half full. Bake at 375 F for 20 to 25 minutes. Cool on wire racks.

Makes 16 servings. Per serving: 240 calories, 7 g fat, 6 g protein, 37 g carbohydrate, 5 g fiber and 115 mg sodium

Web-based Resources

http://beaninstitute.com
The Bean Institute website includes the latest research, cooking videos, newsletters, recipes and other resources.

www.ag.ndsu.edu/food
NDSU Extension has a variety of online nutrition resources.

References

1. Mitchell DC, Lawrence FR, Hartman TJ, Curran JM. Consumption of dry beans, peas, and lentils could improve diet quality in the US population. *J Am Diet Assoc.* 2009;109:909-913.
2. Darmadi-Blackberry I, Wahlqvist ML, Kouris-Blazos A, Steen B, Lukito W, Horie Y, et al. Legumes: the most important dietary predictor of survival in older people of different ethnicities. *Asia Pacific J Clin Nutr.* 2004;13(2):217–220.
3. Lucier G, Lin B-H, Allshouse J, Kantor LS. (2000, April). *Factors affecting dry bean consumption in the United States* (S & O/VGS-280). USDA Economic Research Service. Available from: http://webarchives.cdlib.org/sw1bc3ts3z/http://ers.usda.gov/Briefing/DryBeans/PDFs/DryBeanConsumption.pdf
4. Food and Agriculture Organization of the United Nations. Definition and classification of commodities, 4. Pulses and derived products [cited 2013 Feb 13]. Available from: http://www.fao.org/WAICENT/faoinfo/economic/faodef/fdef04e.htm.
5. Drewnowski A. The Nutrient Rich Foods Index helps to identify healthy, affordable foods. *Am J Clin Nutr.* 2010;91(suppl):1095S–1101S.
6. United States Department of Agriculture, Agricultural Research Service, 2012. USDA National Nutrient Database for Standard Reference, Release 25. Nutrient Data Laboratory Home Page. Available from: www.ars.usda.gov/ba/bhnrc/ndl.
7. U.S. Department of Agriculture and U.S. Department of Health and Human Services. Dietary Guidelines for Americans, 2020-2025. 9th Edition.
8. United States Food and Drug Administration. Guidance for Industry: A Food Labeling Guide [cited 2013 March 14]. Available from http://www.fda.gov/Food/GuidanceRegulation/GuidanceDocumentsRegulatoryInformation/LabelingNutrition/FoodLabelingGuide/ucm064928.htm.
9. Anderson JW, Baird P, Davis RH, Ferreri S, Knudtson M, Koraym A, et al. Health benefits of dietary fiber. *Nutr Rev.* 2009;67(4):188-205.
10. Bourdon I, Olson B, Backus R, Richter BD, Davis PA, Schneeman BO. Beans, as a source of dietary fiber, increase cholecystokinin and apolipoprotein B48 response to test meals in men. *J Nutr.* 2001;131:1485-1490.
11. Brown L, Rosner B, Willett WW, Sacks FM. Cholesterol-lowering effects of dietary fiber: a meta-analysis. *Am J Clin Nutr.* 1999;69:30-42.
12. Anderson JW, Bridges SR. Dietary fiber content of selected foods. *Am J Clin Nutr.* 1988;47:440-447.
13. United States Food and Drug Administration, Health and Human Services: Code of Federal Regulations. Section 101.79—Health claims: folate and neural tube defects. 2012;2. Available from: http://www.gpo.gov/fdsys/pkg/CFR-2012-title21-vol2/xml/CFR-2012-title21-vol2-sec101-79.xml.
14. Hoppner K, Lampi B. Folate retention in dried legumes after different methods of meal preparation. *Food Res Int.* 1993;26:45-48.
15. Keagy PM, Shane B, Oace SM. Folate bioavailability in humans: effects of wheat bran and beans. *Am J Clin Nutr.* 1988;47:80-88.
16. Ashfield-Watt PAL, Moat SJ, Doshi SN, McDowell IFW. Folate, homocysteine, endothelial function and cardiovascular disease. What is the link? *Biomed Pharmacother.* 2001; 55:425-33.
17. Ueland PM, Refsum H, Beresford SAA, Vollset SE. The controversy over homocysteine and cardiovascular risk. *Am J Clin Nutr.* 2000;72:324-32.
18. Van Horn L, McCoin M, Kris-Etherton PM, Burke F, Carson JS, Champagne CM, et al. The evidence for dietary prevention and treatment of cardiovascular disease. *J Am Diet Assoc.* 2008;108:287-331.

19. Anderson JW, Gustafson NJ, Spencer DB, Tietyen J, Bryant CA. Serum lipid response of hypercholesterolemic men to single and divided doses of canned beans. *Am J Clin Nutr.* 1990;51:1013-1019.
20. Bazzano LA, Thompson AM, Tees MT, Nguyen CH, Winham DM. Non-soy legume consumption lowers cholesterol levels: a meta-analysis of randomized controlled trials. *Nutr Metab Cardiovasc Dis.* 2011;21:94-103.
21. Finley JW, Burrell JB, Reeves PG. Pinto bean consumption changes SCFA profiles in fecal fermentations, bacterial populations of the lower bowel, and lipid profiles in blood of humans. *J Nutr.* 2007;137:2391-2398.
22. Kabagambe EK, Baylin A, Ruiz-Narvarez E, Siles X, Campos H. Decreased consumption of dried mature beans is positively associated with urbanization and nonfatal acute myocardial infarction. *J Nutr.* 2005;135:1770-1775
23. Mattei J, Hu FB, Campos H. A higher ratio of beans to white rice is associated with lower cardiometabolic risk factors in Costa Rican adults. *Am J Clin Nutr.* 2011;94:869-876.
24. Shutler SM, Bircher GM, Tredger JA, Morgan LM, Walker AF, Low AG. The effect of daily baked bean *(Phaseolus vulgaris)* consumption on the plasma lipid levels of young, normo-cholesterolaemic men. *Br J Nutr.* 1989;61:257-265.
25. Winham DM, Hutchins AM, Johnston CS. Pinto bean consumption reduces biomarkers for heart disease risk. *J Am Coll Nutr.* 2007;26(3):243-249.
26. Venn BJ, Mann JI. Cereal grains, legumes and diabetes. *Eur J Clin Nutr.* 2004;58:1443-1461.
27. Leathwood P, Pollet P. Effects of slow release carbohydrates in the form of bean flakes on the evolution of hunger and satiety in man. *Appetite.* 1988;10(1):1-11.
28. Hosseinpour-Niazi S, Mirmiran P, Sohrab G, Hosseini-Esfahani F, Azizi F. Inverse association between fruit, legume, and cereal fiber and the risk of metabolic syndrome: Tehran lipid and glucose study. *Diabetes Res Clin Prac.* 2011;94:276-283.
29. Jenkins DJA, Kendall CWC, Augustin LSA, Mitchell S, Sahye-Pudaruth S, Mejia SB, 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; Epubdoi:10.1001/2013.jamainternmed.70.
30. Aune D, De Stefani E, Ronco A, Boffetta P, Deneo-Pellegrini H, Acosta G, et al. Legume intake and the risk of cancer: a multisite case-control study in Uruguay. *Cancer Causes Control.* 2009;20:1605-1615.
31. Amarowicz R, Pegg RB. Legumes as a source of natural antioxidants. *Eur J Lipid Sci Technol.* 2008;110:865-878.
32. Wang S, Meckling KA, Marcone MF, Kakuda Y, Tsao R. Synergistic, additive, and antagonistic effects of food mixtures on total antioxidant capacities. *J Agric Food Chem.* 2011;59:960-968.
33. Thompson MD, Mensack MM, Jiang W, Zhu Z, Lewis MR, McGinley JN, et al. Cell signaling pathways associated with a reduction in mammary cancer burden by dietary common bean (*Phaseolus vulgaris* L.). *Carcinogenesis.* 2012;33(1):226-232.
34. Dahm CC, Keogh RH, Spencer EA, Greenwood DC, Key TJ, Fentiman IS, et al. Dietary fiber and colorectal cancer risk: a nested case-control study using food diaries. *J Natl Cancer Inst.* 2010;102(9):614-626.
35. Bobe G, Barrett KG, Mentor-Marcel RA, Saffiotti U, Young MR, Colburn NH, et al. Dietary cooked navy beans and their fractions attenuate colon carcinogenesis in azoxymethane-induced *ob/ob* mice. *Nutr Cancer.* 2008;60(3):373-381.
36. Lanza E, Hartman TJ, Albert PS, Shields R, Slattery M, Caan B, et al. High dry bean intake and reduced risk of advanced colorectal adenoma recurrence among participants in the polyp prevention trial. *J Nutr.* 2006;136:1896-1903.
37. Mentor-Marcel RA, Bobe G, Barrett KG, Young MR, Albert PS, Bennink MR, et al. Inflammation-associated serum and colon markers as indicators of dietary attenuation of colon carcinogenesis in *ob/ob* mice. *Cancer Prev Res.* 2009;2(1):60-69.
38. Mills PK, Beeson WL, Phillips RL, Fraser GE. Cohort study of diet, lifestyle, and prostate cancer in Adventist men. *Cancer.* 1989;64:598-604.
39. Kolonel LN, Hankin JH, Whittemore AS, Wu AH, Gallagher RP, Wilkens LR, et al. Vegetables, fruits, legumes and prostate cancer: a multiethnic case-control study. *Cancer Epidemiol Biomarkers Prev.* 2000;9:795-804.
40. Vinson JA, Hao Y, Su X, Zubik L. Phenol antioxidant quantity and quality in foods: vegetables. *J Agric Food Chem.* 1998;46:3630-3634.
41. Madhujith T, Naczk M, Shahidi F. Antioxidant activity of common beans (*Phaseolus vulgaris* L.) *J Food Lipids.* 2004;11:220-233
42. Xu BJ, Chang SKC. Total phenolic content and antioxidant properties of eclipse black beans (*Phaseolus vulgaris* L.) as affected by processing methods. *J Food Sci.* 2008;73(2): H19-H27.
43. Papanikolaou Y, Fulgoni VL. 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(5):569-576.
44. Ledikwe JH, Smiciklas-Wright H, Mitchell DC, Miller CK, Jensen GL. Dietary patterns of rural older adults are associated with weight and nutritional status. *J Am Geriatr Soc.* 2004;52:589-595.
45. Hermsdorff HHM, Zulet MA, Abete I, Martínez JA. A legume-based hypocaloric diet reduces proinflammatory status and improves metabolic features in overweight/obese subjects. *Eur J Nutr.* 2011;50:61-69.
46. Williams PG, Grafenauer SJ, O'Shea JE. Cereal grains, legumes, and weight management: a comprehensive review of the scientific evidence. *Nutr Rev.* 2008;66(4):171–182.
47. Sichieri R. Dietary patterns and their associations with obesity in the Brazilian city of Rio de Janeiro. *Obes Res.* 2002;10(1):42-48.
48. Cunha DB, de Almeida RMVR, Sichieri R, Pereira RA. Association of dietary patterns with BMI and waist circumference in a low-income neighbourhood in Brazil. *Br J Nutr.* 2010;104:908-913.
49. McCrory MA, Hamaker BR, Lovejoy JC, Eichelsdoerfer PE. Pulse consumption, satiety, and weight management. *Adv Nutr.* 2010;1:17–30.
50. Abete I, Parra D, Martinez JA. Legume-, fish-, or high-protein-based hypocaloric diets: effects on weight loss and mitochondrial oxidation in obese men. *J Med Food.* 2009;12(1):100-108.
51. Zhang Z, Lanza E, Ross AC, Albert PS, Colburn NH, Rovine MJ, et al. A high-legume low-glycemic index diet reduces fasting plasma leptin in middle-aged insulin-resistant and -sensitive men. *Eur J Clin Nutr.* 2011;65:415-418.
52. Newby PK. Plant foods and plant-based diets: protective against childhood obesity? *Am J Clin Nutr.* 2009;89(suppl):1572S–1587S.
53. United States Department of Agriculture, Food and Nutrition Service. Child Nutrition Programs, Part 210, National School Lunch Program [cited 2013 Feb 20]. Available from: http://www.fns.usda.gov/cnd/governance/regulations/7cfr210_12.pdf.
54. Niewinski MM. Advances in celiac disease and gluten-free diet. *J Am Diet Assoc.* 2008;108:661-672.
55. Craig WJ. Health Effects of vegan diets. *Am J Clin Nutr.* 2009;89(suppl):1627S–1633S.
56. United States Department of Agriculture, Economic Research Service. Retail data for beef, pork, poultry cuts, eggs and dairy products (September 14, 2012). Cited 2012 October 15 from http://www.ers.usda.gov/data/meatpricespreads/.
57. Winham DM, Hutchins AM. Perceptions of flatulence from bean consumption among adults in 3 feeding studies. *Nutr J.* 2011;10:128.
58. Vidal-Valverde C, Frías J, Valverde S. Changes in the carbohydrate composition of legumes after soaking and cooking. *J Am Diet Assoc.* 1993;93:547-550.
59. Szafranski M, Whittington JA, Bessinger C. Pureed cannellini beans can be substituted for shortening in brownies. *J Am Diet Assoc.* 2005;105(8):1295-1298.
60. Anton AA, Ross KA, Lukow OM, Fulcher RG, Arntfield SD. Influence of added bean flour (*Phaseolus vulgaris* L.) on some physical and nutritional properties of wheat flour tortillas. *Food Chem.* 2008;109:33-41.
61. Duyff RL, Mount JR, Jones JB. Sodium reduction in canned beans after draining, rinsing. *J Culin Sci Technol.* 2011;9(2):106-112.

This publication was produced with support from Northarvest Beans.

For more information on this and other topics, see www.ndsu.edu/extension

1M-4-13, 5M-7-13 Northarvest. web-1-24