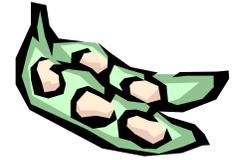


THE HEALTHFUL SOYBEAN



Soy protein bars, soy milk, soy cookies, soy burgers the list of soy products goes on. Soybeans are best known as a source of high quality protein. They are also rich in calcium, iron, zinc, vitamin E, several B-vitamins, and fiber. But in 1999, soy took the nation by storm. The Food and Drug Administration approved health claims that soy protein may lower the risk of heart disease if at least 25 grams of soy protein are consumed daily. This benefit may be because soybeans are low saturated fat, have an abundance of omega-3 fatty acids, and are rich in isoflavones. Research continues to explore health benefits linked to the healthful soybean. Beyond research, edamame, tempeh, tofu, and soy milk make the base for some truly delectable dishes.

Exploring Soyfoods

Fresh Green Soybeans

Edamame (fresh green soybeans) have a sweet, buttery flavor and a tender-firm texture. Fresh soybeans still in the pod should be cooked and stored in the refrigerator. Handle frozen soybeans as you would any other frozen vegetable.

The easiest way to cook washed, fresh soybeans in the pod is to simmer them in salted water for 5 minutes. Once the beans are drained and cooled, remove them from the pod. Eat as a snack or simmer an additional 10 to 15 minutes to use as a side dish. Substitute soybeans for lima beans, mix the beans into soups or casseroles in place of cooked dried beans, or toss the beans with pasta or rice salads.

Dried Soybeans

Dried mature soybeans are cooked like other dried beans. The yellow and black soybeans are the easiest to find. They are also available already cooked in cans. Salt or acidic ingredients, such as tomatoes, lemon juice, or vinegar should not be added to yellow soybeans until after cooking because the beans will not soften properly. Adding these acidic ingredients while cooking black soybeans, however, helps them retain their shape. The water used for cooking soybeans makes a flavorful base for soups, sauces, and gravies.

Soy Grits

Soy grits are toasted, cracked soybeans that are usually the size of tiny flakes. Cooking time for soy grits will vary according to the size of the grind, so follow the directions on the package. Cook grits with rice to use in casseroles, patties, and croquettes, or stir grits into soups, stews, or casseroles.



Soy Oil

Soy oil is the natural oil extracted from whole soybeans. It accounts for 75 percent of an American's total vegetable oil intake. It contains 61 percent polyunsaturated fat, and 24 percent monounsaturated fat. It is also a good source of essential fatty acids. One teaspoon of soy oil contains 45 calories.

Soy Milk

Rich, creamy soy milk is the result of pressing the liquid from ground soybeans. Soy milk is available in regular and low-fat, a variety of flavors, and is lactose and casein-free. Some brands are fortified with calcium, vitamin D, and/or vitamin B₁₂. When substituting soy milk for dairy milk in your diet, choose soy milk fortified with calcium and vitamin D.



Unopened, aseptic-packaged soy milk can be stored at room temperature for several months. Once opened, the milk should be refrigerated and used within five days. Refrigerated cartons of soy milk must be kept refrigerated and used by the expiration date. Powdered soy milk must be mixed with water before using. The powder maintains freshness if stored in the refrigerator or freezer.

Since brands of soy milk vary in creaminess, color, and taste, try several to see which you prefer. Use soy milk over breakfast cereal and in breads, cream sauces, soups, shakes, custards, and puddings. Soy milk itself is not an infant formula, but there are commercially-prepared soy milk infant formulas available.

Tofu

Tofu, or bean curd, is a white almost tasteless custard-like food made from curdling fresh soy milk. The curds are then pressed into cakes. Depending on how much liquid is expelled during the pressing, the resulting tofu may be labeled soft or firm. Silken tofu, which is smooth and creamy, is made using a heat process.

Tofu is easily digested, even by people who usually have trouble digesting legumes. It is rich in protein and contains B-vitamins, iron, and calcium. If a calcium salt, such as calcium sulfate, is used as the coagulant in making the tofu, it will be high in calcium. The amount of fat in tofu varies, too, with softer tofu generally having less fat than firmer varieties. Reduced-fat tofu is also available. Check the Nutrition Facts Panel and ingredients list for additional information.

Unless aseptically packaged, tofu should be refrigerated and used before the expiration date on the package. After opening, rinse the tofu and cover with fresh water. Store it refrigerated in a covered container and change water daily. Use within one week. To freeze tofu for up to five months, drain and wrap it well. When frozen, the tofu will turn yellow, but the original color will return when thawed. Frozen tofu is chewier than regular tofu and readily soaks up marinade sauces. Thaw the tofu in the refrigerator or microwave and squeeze out the excess liquid before using.



Tofu has little flavor of its own, so it absorbs the flavor of the food or seasonings it is mixed with. Extra firm and firm tofu are perfect for slicing and pan frying. Extra firm tofu holds together for broiling, baking, frying, and boiling. Softer varieties are good for pureeing, mashing, and crumbling when added to soups or salads. Since silken tofu has such a smooth texture, it is good in dips, sauces, puddings, and cheesecake or other desserts. Pureed silken tofu

can be used as a substitute for cream in creamed soups and for sour cream, yogurt, or mayonnaise in dips, spreads, and salad dressings. Use mashed tofu for cooked beans in dips and sandwich spreads. Replace some or all of the ground meat in a recipe with browned, thawed frozen tofu. Start by serving in dishes such as chocolate mousse or vegetable dip, where the flavor and texture are more familiar. Then add dishes to your diet where the tofu is more easily identified.

Soy Flour



Soy flour is made from roasted soybeans. Food processors use it in baked goods because the soy flour makes a moist, tender product. Natural or full-fat soy flour, which contains all the natural oil found in soybeans, should be stored in the refrigerator or freezer to preserve its freshness. Defatted soy flour has the oils removed during the processing and may be stored on the shelf.

Always stir soy flour before measuring, as it packs in the container. Baked products using soy flour tend to brown more quickly, so lower the oven temperature slightly or reduce the cooking time. To produce dense bread with a nutty flavor and a moist quality, place 2 tablespoons of soy flour into the measuring cup before filling it with wheat flour. Wheat flour provides gluten, which gives structure to yeast-raised bread, so it cannot be entirely replaced.

In quick breads, use $\frac{1}{4}$ cup soy flour for every cup of flour. Premix a batch of 1 part soy flour and 3 parts wheat flour so it is ready to use when baking. Soy flour can also act as an egg substitute in baked products. Replace one egg with 1 tablespoon soy flour plus 1 tablespoon water.

Textured Soy Protein (TSP)

Textured soy protein, or TSP, is sometimes labeled TVP, or textured vegetable protein. TSP is made from defatted soy flour that has been compressed and processed into granules or chunks. Because TSP is low in moisture, it will last in a tightly-closed container at room temperature for several months.

TSP must be rehydrated before using. It should be refrigerated and used within a few days. For every cup of TSP, add $\frac{7}{8}$ cup of boiling water. Simmer the chunks for a few minutes and use just like ground beef. If you replace one-fourth of the ground meat in loaves and burgers with rehydrated TSP, most individuals will not be able to tell the difference.

Soy Meat Analogs

Many companies produce soy products that mimic the taste, texture, and appearance of meats, poultry, and fish. Products containing meat analogs are burgers, hot dogs, sausages, taco fillings, and deli slices. They are primarily made from a mixture of soy protein, wheat gluten, and carbohydrates. Follow package directions for preparation.

Tempeh

Tempeh is made from the controlled fermentation of whole soybeans. It has a firm texture and a distinctive mushroom-like flavor. Tempeh can be made entirely from soybeans, or from soybeans fermented with rice, barley, or other grains. Tempeh is usually purchased frozen. It can be stored in the freezer for several months or in the refrigerator for about ten days. Tempeh must be cooked before eating. Steam or simmer for 20 minutes. Marinate steamed tempeh, then bake, broil, or grill it.

Miso

Miso is a salty, fermented condiment made from ground soybeans or ground soybeans with the addition of rice or other grains. Different types of miso vary in flavor, texture, color, and aroma. Dark miso has a sweeter, more delicate taste. Miso is found in the refrigerated section of natural food stores and Asian markets. It will last several months if refrigerated, which is recommended. If left at room temperature, miso will develop a harmless white mold. Scrape it off or mix it into the miso. Add miso at the end of the cooking process to flavor soups, sauces, dressings, marinades, and spreads. Because miso is very high in sodium, omit the salt and soy sauce when adding miso to a recipe.

Nutritional Comparisons

Soyfood	Serving Size	Calories	Protein (g)	Carbohydrates (g)	Fat (g)
Edamame	½ cup cooked	127	11	10	6
Dried Beans	½ cup cooked	149	14	9	8
Soy Milk	8-ounces	140	10	14	4
Tofu, firm	1/5 block	80	9	4	2
TSP	½ cup	126	25	14	
Soy Flour, defatted	¼ cup	82	12	10	
Tempeh	¼ cup	83	8	7	3
Miso	2 tablespoons	71	4	2	9
Soy Grits	¼ cup	128	20	13	3

Nutritional analysis from Bowes & Church's Food Values of Portions Commonly Used, 18th edition. Lippincott Williams and Wilkins (2005).

Soy Substitutions

Food Ingredient	Soy Substitution	Serving Size	Fat (g) Saved	Cholesterol (mg) Saved	Calories Saved
Ground beef (85% lean), cooked	½ cup reconstituted TVP granules (plain or beef flavored)	3-ounce	14	71	99
Egg (leavening agent in baking)	¼ cup lite silken tofu, mashed	Equivalent to 1 egg	4.5	213	53
Egg (leavening agent in baking)	1/3 cup soft tofu, mashed	Equivalent to 1 egg	2.5	213	33
Dairy whole milk	regular soy milk, reconstituted dry soy milk	8-ounce	4	33	10
Dairy 2% milk	lite or reduced-fat soy milk, reconstituted dry soy milk	8-ounce	3	18	20
Chicken breast (without skin, small chunks), cooked	½ cup reconstituted TVP granules, chicken flavored	3-ounce	3	77	58
Sour cream	tofu sour cream	1 tablespoon	2.5	5	19
Ricotta cheese, part-skim	firm tofu, mashed to ricotta consistency	1 tablespoon	0	5	0
Cheddar cheese	soy cheddar cheese	1-ounce	4	30	36

Recommended by the Kentucky Soy Board, www.kysoy.org. Used with permission, 2007.

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December 1997; Revised July 2007

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