



# Soy Nutritional Content

Like other legumes, soybeans are rich in a variety of vitamins and minerals. However, the macronutrient profile of soybeans differs in some important ways from most other legumes. Soybeans are higher in both protein and fat than other beans and are relatively low in carbohydrates.

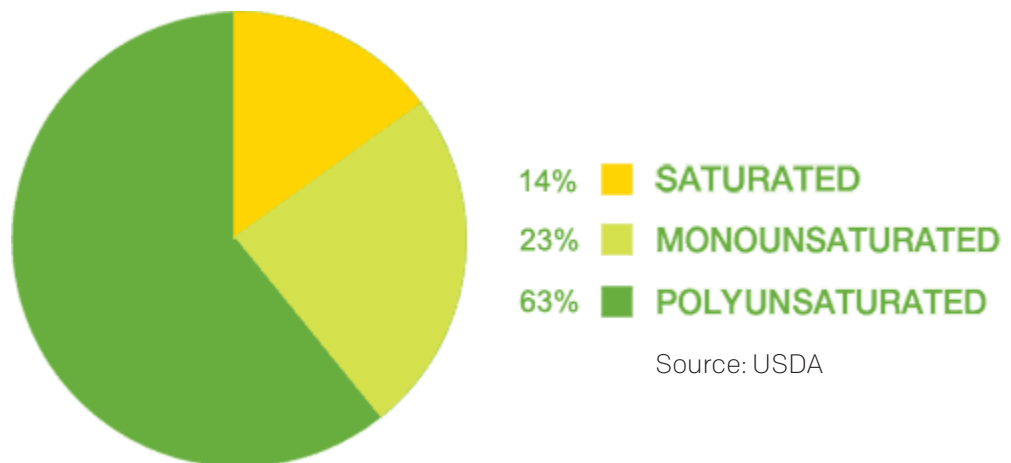
## MACRONUTRIENTS IN SOYBEANS

**Protein:** Soybeans derive about 35 to 38 percent of their calories from protein compared to approximately 20 to 30 percent in other legumes. Soy protein is also of the highest quality. Under guidelines adopted by the Food and Drug Administration and the World Health Organization for evaluating protein quality for children and adults, soy protein isolate receives a score of 1, which is the highest possible score. This means that the quality of soy protein is equal to that of meat and milk proteins.

**Fat:** Approximately 40 percent of the calories in soy derive from fat; most legumes (with the exception of peanuts) contain between 2 and 14 percent fat. The fat portion of the soybean is used extensively both in the food industry and directly by consumers. Soybean oil is a common cooking oil; cooking oils sold as “vegetable oil” are usually soybean oil.

Most of the fat in soybeans is unsaturated. Polyunsaturated (primarily linoleic acid), monounsaturated (oleic acid) and saturated (primarily palmitic acid) fatty acids comprise about 63 percent, 23 percent, and 14 percent, respectively, of the total fat content of soybeans. The polyunsaturated fat content of soybeans is of interest because it includes alpha-linolenic acid (7 percent of the total fat content), an essential omega-3 fatty acid. Soybeans are one of the few good plant sources of both essential fatty acids.

Some soyfoods have the fat removed. Defatted soy flour is available and the amount of fat in textured soy protein is negligible. Reduced-fat tofu and reduced or non-fat soymilk are also available to consumers who want to decrease the fat in their diets.



Source: USDA



Fiber: All whole, unprocessed plant foods contain dietary fiber. One serving of soybeans provides approximately eight grams of dietary fiber. However, some soyfoods are processed in ways that decrease their fiber content significantly. Tofu and soymilk contain very little fiber, while soyfoods that utilize the whole bean — such as tempeh, soy flour and textured soy protein — are high in fiber. About 30 percent of the fiber in soyfoods is soluble fiber.

### **MICRONUTRIENTS IN SOYFOODS**

Calcium: Many soyfoods are good sources of calcium. One half cup of cooked soybeans provides 88 mg of this mineral. Processing affects the calcium content of soyfoods considerably. Many brands of tofu are made using calcium sulfate as a coagulant (sometimes referred to as “calcium-set” tofu) and can contain between 120 and 750 mg of calcium per 1/2 cup serving. Soymilk contains about 93 mg of calcium per one cup serving. However, a growing number of calcium-fortified soymilks are available; these often contain between 200 and 300 mg of calcium per serving. Although soyfoods are high in both oxalates and phytate, two compounds that inhibit calcium absorption, the calcium from soyfoods is very well absorbed; in fact, it is absorbed as well as calcium from cow’s milk.

Iron: A 1/2 cup serving of cooked soybeans provides 4 mg of iron. However, both phytate and soy protein reduce iron absorption so that the iron in soyfoods is generally poorly absorbed. Vitamin C can increase the amount of iron absorbed from soyfoods considerably, although absorption rates are still low. Iron may be better absorbed from fermented soyfoods like tempeh and miso. Also, new research suggests the absorption of iron from soyfoods has been underestimated.

Other nutrients: Soyfoods are high in zinc; 1/2 cup of cooked soybeans contains 1 mg of zinc. However, zinc is poorly absorbed from soyfoods. Soyfoods are also rich in copper and magnesium. Like legumes in general, soyfoods are also rich in B-vitamins, particularly niacin, pyridoxine and folacin.



## NUTRIENT CONTENT OF SOYFOODS

| Food                                    | Calories | Protein grams | Carbohydrate grams | Fat grams | Saturated Fat grams |
|---|----------|---------------|--------------------|-----------|---------------------|
| Soybeans<br>1/2 cup, cooked             | 149      | 14.3          | 8.5                | 7.7       | 1.1                 |
| Tempeh 1/2 cup                          | 165      | 15.7          | 14.1               | 6.4       | 1.1                 |
| Textured Soy Protein<br>1/2 cup, cooked | 59       | 11            | 7                  | 0.2       | fat-free            |
| Soynuts 1/4 cup                         | 202      | 15            | 14.5               | 10.0      | 1.6                 |
| Tofu 1/2 cup                            | 94       | 10            | 2.3                | 5.9       | 0.9                 |
| Soy flour,<br>defatted 1/4 cup          | 81.7     | 12.8          | 8.4                | 0.3       | .02                 |
| Soymilk,<br>plain 1 cup                 | 79       | 6.6           | 4.3                | 4.6       | 0.5                 |

| Food                                    | Niacin mg | B6 mg   | Folic Acid ug | Calcium mg | Iron mg | Magnesium mg | Copper mg | Zinc mg |
|---|-----------|---------|---------------|------------|---------|--------------|-----------|---------|
| Soybeans<br>1/2 cup, cooked             | 1.35      | .20     | 47            | 88         | 4.42    | 74           | .35       | .99     |
| Tempeh 1/2 cup                          | 3.8       | .25     | 43            | 77         | 1.9     | 58           | .55       | 1.5     |
| Textured Soy Protein<br>1/2 cup, cooked | .75       | .12     | ---           | 85         | 2       | 86           | .32       | 1.37    |
| Soynuts 1/4 cup                         | 0.6       | .09     | 91            | 59         | 1.65    | 63           | .35       | 1.35    |
| Tofu 1/2 cup                            | 0.2       | .06     | 19            | 130*       | ---     | 127          | .24       | 1.00    |
| Soyflour,<br>defatted 1/4 cup           | 0.65      | .14     | 76            | 60         | 2.3     | 72           | 1         | .61     |
| Soymilk,<br>plain 1 cup                 | 1.4       | .10     | 4             | 93         | 1.38    | 45           | .288      | .54     |
| Miso 2 Tbsp.                            | 0.3       | ---     | 10.1          | 23         | .95     | 14.5         | .15       | 1       |
| Adult Recommended Daily Allowance       | 15        | 1.6-2.0 | 180-200       | 800        | 10-15   | 280-350      | 1.5-3.0   | 12-15   |

Source: USDA