

HOME ECONOMICS GUIDE



Published by the University of Missouri-Columbia
Extension Division
College of Home Economics

Soybeans

Areva M. Abernathy
Area Home Economist

Green Soybeans

Green or immature soybeans are similar to bright green peas or lima beans in color and flavor. Green soybeans have a firm, slightly crisp texture and are not mealy or soft. They are ready to use as food when the pods are bright green and plump. They stay in the "green" stage for five to 10 days depending on climatic conditions. If it is sunny and dry, they will mature a little more rapidly. If it is more damp, they will stay green slightly longer.

Each pod contains two to four beans. The fuzzy pods are not edible. The pod is very difficult to remove so the shelling process is unique. Boiling the fuzzy pods hastens the shelling process. After washing the pods, they are heated in boiling water for 10 minutes. Next, the beans are cooled in cold water so they are not too hot to handle. At this point the pods can easily be squeezed or broken to remove the beans. The novelty of squeezing the bean from the pod is different from any other American food. They can be prepared the same way as green limas or preserved by freezing or canning.

Soybeans make nutritious and entertaining snacks. When sufficiently cooked they can be refrigerated in covered containers for two or three days and handfuls are good at snack time.

Nutrition

A one-half cup serving of hulled (out of the pod) soybeans has the same amount of protein as an 8 ounce (240 gm.) glass of milk. The iron content is similar to the amount of iron in two eggs. It provides about one-tenth the daily vitamin A allowances and about one-half the daily vitamin C allowances for adults. Although the carbohydrate content of one-half cup of green soybeans is less than an equivalent serving of lima beans, corn, or potatoes, the fat content in the soybeans makes their caloric value approximately the same.

Preparing Green Soybeans

Like other vegetables, green soybeans are best used while fresh. Boil 2 cups of shelled green soybeans in about 1 cup of water for 15 to 20 minutes. Green soybeans also can be prepared by steaming for about the same length of time. Season with table fat, crisp bacon, salt pork, or other seasoning. Cold cooked green soybeans are excellent in salads.



Soybeans

Variations

Soybeans Au Gratin: Make a white sauce with 2 tablespoons flour, 1 cup water and $\frac{1}{3}$ cup dry milk. Cook 5 minutes over low heat. Add 1 tablespoon butter or margarine, 2 teaspoons minced onion, and $\frac{1}{2}$ cup grated cheese. Mix with $2\frac{1}{2}$ cups of cooked green soybeans. Pour into a well-greased baking dish. Sprinkle with 2 tablespoons of dry bread crumbs. Bake at 350°F for 20 minutes.



Soybeans in the field.

Soybeans with Corn: Combine 2 cups cooked green soybeans, 2 cups whole kernel corn, 2 tablespoons butter or margarine, $\frac{1}{2}$ teaspoon salt, and pepper. Simmer 10 minutes. Serve.

Soybeans and Carrots: Combine $2\frac{1}{2}$ cups diced carrots, $2\frac{1}{2}$ cups cooked green soybeans, $\frac{1}{2}$ teaspoon salt, 2 tablespoons butter or margarine, and $\frac{1}{2}$ cup water. Simmer 15 to 20 minutes. Serve.

Soybean-Carrot Salad: Combine 2 cups cooked green soybeans, $2\frac{1}{2}$ cups grated raw carrots, $\frac{1}{4}$ cup chopped onion and/or green pepper, $\frac{1}{2}$ teaspoon salt, and $\frac{1}{3}$ cup salad dressing. (Homemade salad dressing is particularly good). Refrigerate before serving.

Four Bean Salad: Combine 1 cup *each* of cooked (or canned) drained green beans, wax beans, kidney beans, and green soybeans and $\frac{1}{2}$ cup diced celery and $\frac{1}{2}$ cup sliced onion. Mix $\frac{1}{4}$ cup salad oil, $\frac{1}{4}$ to $\frac{1}{3}$ cup sugar, $\frac{1}{4}$ cup vinegar and boil. Pour over bean mixture. Refrigerate 24 hours before serving.

Canning Green Soybeans: About 4 to 5 pounds of unshelled beans are needed for each quart. Cover washed shelled beans with boiling water and boil 3 to 4 minutes. Pack hot into jars. Add cooking water leaving one-inch head space. Process at 10 pounds pressure (240°F) — pints, 60 minutes — quarts, 70 minutes.

Freezing Green Soybeans: Boil green (shelled) soybeans 3 to 4 minutes. Cool. Pack into containers leaving a $\frac{1}{2}$ inch head space. Seal and freeze. Soybeans boiled in the pod for 5 minutes for shelling do not need to be heated again before freezing.

Dried Soybeans

Dried soybeans are the mature form. They are allowed to remain in the fields until the plants lose their leaves and the pods are brown. Seed soybeans that have been chemically treated for seeding purposes should *not* be eaten.

To harvest dry soybeans by hand first cut or pull the plants. Put several plants into a bag. Beat out the seed with a stick or a board. Or use machine harvested beans already out of the pod.

Nutrition

Dried soybeans are outstanding for their protein content. A half cup of cooked soybeans contains about the same amount of protein as a 2 ounce serving of meat. Iron, B vitamins, and calcium are important contributions. A one-half cup of cooked dried soybeans contains iron equivalent of 3 eggs and calcium equivalent to about one-half cup of milk.

Preparing Dried Soybeans

Remove debris from the hulled dry soybeans. Discard any discolored, cracked, or shriveled beans. Wash. Cover dried beans with twice their volume of water and soak 8 to 10 hours. Refrigerate while soaking.

A one-third cup of dried soybeans will swell to almost 1 cup during soaking and cooking. One cup of dried soybeans will yield about $2\frac{1}{2}$ to 3 cups when cooked. A pound of dried soybeans contains about $2\frac{1}{4}$ cups before cooking or 6 to 7 cups after cooking.

The beans can be simmered or prepared in a pressure cooker. If not all the soaked soybeans are to be used, they freeze well for later cooking. Freezing reduces cooking time.

Simmer: Cook dried soybeans in soaking water adding more water if necessary. Skim off husks and foam at the beginning of cooking. Simmer in a covered pan until tender (about $2\frac{1}{2}$ to 3 hours).

Pressure Cooker: Put soaked soybeans in an uncovered pressure cooker. Do not fill the pressure saucepan more than one-third full of soaked soybeans. Boil 5 minutes. Skim off husks and foam. Add 1 tablespoon fat. Cook (with lid) at 15 pounds pressure for 30 minutes or 10 pounds for 35 minutes.

The cooked dried soybeans can be used the same ways navy beans are used - seasoned with meat broth or drippings or chopped meat. Cooked dried soybeans can be used in soup, in salads, in patties, in loafs or stuffings, in sandwich fillings, and in dips. Or dried soybeans can be roasted for snacks.

Variations

Beef Patties: Mash 2 cups cooked dry beans to make a pulp. Beat 1 egg with 1 tablespoon Worcestershire sauce and $\frac{1}{8}$ teaspoon pepper. Add to mashed beans. Shape into patties. Roll in fine bread crumbs. Fry in fat until brown on both sides.

This pulp can be substituted for regular soy flour. Use 1 cup of pulp for $\frac{1}{2}$ cup of soy flour and decrease liquid in the recipe by a scant $\frac{1}{2}$ cup. Use the pulp within 2-3 days or freeze it for later use.

Soybean-Tomato Casserole: Combine 3 cups cooked dried soybeans, 1 tablespoon fat, 2 cups tomatoes, 1 teaspoon cinnamon, 2 teaspoons chopped onion, 1 tablespoon chopped parsley, 1 tablespoon chopped green pepper, 2 tablespoons honey, and/or 1 cup chopped cooked meat of your choice. Put in a greased baking dish. Bake 20 minutes at 350°.

Soybean Chile: Brown one-half pound of ground lean meat, salt pork, or canned meat until crisp. Remove the meat and brown one-fourth cup chopped onions. Add the meat, 2 cups cooked dried soybeans, 2 cups of tomatoes (canned or fresh),

1 tablespoon chile powder, and salt if needed. Heat to boiling.

Soybeans Au Gratin: Make a white sauce of 2 tablespoons flour, 1 cup water, and $\frac{1}{3}$ cup dry milk. Cook 5 minutes over low heat. Add 1 tablespoon fat, 2 teaspoons minced onion, $\frac{1}{2}$ cup grated cheese, and $2\frac{1}{2}$ cups cooked dried soybeans. Pour into a well-greased baking dish. Cover with bread crumbs. Bake at 350° for 20 minutes.

Soybean Sandwich Filling: Combine 2 cups chopped or mashed (cooked dried) soybeans, $\frac{1}{2}$ cup chopped pickle or relish, 1 tablespoon chopped green onion, $\frac{1}{2}$ teaspoon salt, and $\frac{1}{4}$ cup salad dressing. Blend to consistency for spreading. Spread on plain or toasted bread.

Baked Soybeans: Mix $2\frac{1}{2}$ cups cooked dried soybeans, 2 tablespoons diced onion, $\frac{1}{2}$ cup catsup, and 2 strips of crisp, chopped bacon. Bake at 350° for about an hour.

Soybean Tamales: Mix $\frac{3}{4}$ pound ground meat, $\frac{1}{2}$ cup mashed (drained cooked dried) soybeans, $\frac{1}{2}$ cup raw rolled oats (crushed or raw quick cooking oats), 1 tablespoon chile powder or pepper, and 1 teaspoon salt. Portion this filling into serving size squares of tamale dough made from 1 cup flour, 1 cup corn meal, 1 teaspoon salt and 1 tablespoon chili powder and pepper; moisten with cold water to make a stiff dough. Roll squares to about $\frac{1}{8}$ inch thick, fill, and seal edges. Drop into boiling water about 5 minutes. Place in a baking dish. Cover with $\frac{1}{2}$ cup catsup, 2 or 3 cups tomato juice, 1 tablespoon chile powder or pepper. Bake at 400° about 30 minutes.

Roasted Soybeans: Drain soaked dried soybeans. Spread to air dry for about one hour. Put about one cup of beans in a metal frying basket. Fry in fat at 350°F for 8 to 10 minutes. The beans should be crisp and the color of roasted peanuts without skins. Salt with plain or seasoned salt (garlic, spiced or herb salts, for variation).

Dry Roasted Soybeans: Add salt to the soaking dried soybeans during the last 3 hours. Drain. Air dry. Spread in one layer in a shallow pan. Oven roast at 450°F for 20 to 30 minutes. Stir occasionally.

Soybean Sprouts

Soy, like mung beans, can be sprouted in a flower pot, a sink strainer, a milk carton punched with holes, or any container that can be covered and has holes or an opening for drainage. Remember the beans swell and sprout to about six times their dried size. Be sure to select a large enough container.

Soak the dried soybeans in three times as much water for about 12 hours in the refrigerator to prevent fermentation. Drain and pick out the imperfect ones. Put the perfect looking soaked beans in a container with good drainage. Sprout a single layer of beans in each container so soft beans and those that look as though they may not sprout can easily be removed. Keep the container in a cool place about 64°F to 70°F . The refrigerator is too cool for sprouting.

Flood with lukewarm water three to five times a day during the sprouting period. Mold and fermentation can be prevented if sprouts are rinsed once a day with a water-chlorine bleach solution of 3 to 4 drops of chlorine bleach per quart of water; or by using a 10 percent chlorine bleach solution (6 tablespoons chlorine bleach in a quart of water) on the soaked beans for 3 minutes and rinsing daily in clean water. If water does not drain off, mold will grow. If the beans have a spoiled odor, discard the batch.

In four to six days the plump, round sprouts will be 2 to 3 inches long. Remove the hulls during sprouting without separating the two bean halves. Do not let rootlets develop nor root-tips become sharp and pointed. When they appear, the sprouts begin to toughen.

To cook drop bean sprouts in boiling water and boil for 5 minutes. Cool at once in ice water. Refrigerate until used. Soybean sprouts can be refrigerated for 3 to 5 days. Thoroughly rinse and drain sprouts before use. Keep them in a tightly sealed container for crispness.

Soybean sprouts add interesting flavor, color, form, and texture in raw salads, omelets, vegetable combinations, souffles, meat stew, or fricasees. The sprouts are very tender. In order to keep the sprouts crisp, do not add them to hot mixtures until a few minutes before serving.

Soybean "Milk"

The best soybeans to use for making milk are Bansei, Hokkaido, Haberlandt, Mammoth Yellow, Dixie and Rokusun. Most field varieties make nice milk. The creamy white soybean milk can be used in practically any recipe calling for milk. For instance, it may serve as one of the chief ingredients in a creamed vegetable soup, with eggs in custard, in cocoa, or in other hot beverages. Soybean milk does not freeze well. It precipitates (curdled appearance) and can be used to make soybean curd rather than throwing it away.

The milk may be made by either of two methods. For either method start with dried soybeans that have been washed and soaked and drained. The chart shows how much extra water is needed to make soy milk:

Soaked Soybeans	Amt. Water to Make Soy Milk
$6\frac{3}{4}$ cups	3 quarts
$3\frac{1}{2}$ cups	$1\frac{1}{2}$ quarts
$1\frac{3}{4}$ cups	3 cups

Method 1: Grind the beans very fine in a food blender or food grinder. In the *food blender* grind together 1 cup soaked beans and $\frac{1}{2}$ cup water then add the rest of the water (see chart) required for the amount of beans being used to make the milk.

If a *food grinder* is used, grind the drained soaked beans adding the needed amount of water after grinding for the amount of beans being used (see chart). Work thoroughly with hands 5-10 minutes. Put the mash and water in a cheese cloth. Wring the bag until the mash is dry. Simmer the soybean milk in a covered pan on low heat for 30 minutes stirring frequently to prevent scorching or cook in a covered double boiler for 1 hour. Add a little salt and sugar to taste.

Two products result from making soybean milk — the milk and the ground, raw soybean which is called mash. These can be cooked together or separately depending on how they are used.

Method 2: After washing the dry soybeans, let them dry thoroughly. Crack them; then grind them fine. To each pound of dry beans (about $6\frac{3}{4}$ cups soaked unground) add 3 quarts water and soak for 2 hours. Boil for 20 minutes stirring constantly. Squeeze this milk through a cheese cloth.

Soybean Mash

The mash is what is left after soybean milk has been extracted. It must be cooked to eliminate the beany flavor, to prevent spoilage, and to destroy the enzyme which causes flatulence (gas production in the digestive tract). To cook soybean mash, put the desired amount of mash into the top part of a double boiler. Add salt to taste to each pint of mash. If the mash is too dry, moisten it with soybean milk or add water. Stir occasionally and cook for about one hour or until the raw soybean flavor is gone. Keep in a covered jar in a cold place. The soybean mash can be used to extend ground meat mixtures in casseroles, meatloaves and patties.

Soybean Milk Soup

2 quarts soybean milk	6 tablespoons flour
6 tablespoons butter or other fat	1½ teaspoons salt
	White pepper
2 tablespoons chopped onions	Watercress or parsley, finely cut.
1 cup chopped celery	

Melt the fat in a frying pan, add the onion and celery, and cook for about 5 minutes. Add the flour, mix until smooth, and gradually add the soybean milk. Cook the soup in a double boiler, stirring constantly until smooth and slightly thickened. Continue to cook for one-half hour. Add salt and pepper. Just before serving, add watercress or parsley.

Soybean Curd

Soybean curd is prepared from soybean milk either by adding vinegar, lemon juice, or calcium chloride. Although some cultures allow the milk to ferment naturally in a warm place, the taste and aroma are very different. To make soybean curd with vinegar, heat 4 quarts of soybean milk to 180°F., add 2 cups of vinegar, and stir until well mixed. Or, add 1½ teaspoons calcium chloride dissolved in about a ½ cup of water. Let stand a few minutes.

Put the curd in a cheesecloth bag and dip the bag in cold water several times to wash away the excess acid or calcium chloride. Drain for about an hour and press out the remaining liquid. Season with salt and pack tightly into a dampened mold. Cover and store in a cold place until firm enough to cut.

To make soybean curd by fermentation, keep the milk in a warm place overnight or until it forms a curd. Stir to break the curd. Add an equal quantity of water heated almost to boiling and let stand for 10 minutes. Pour into a cheese cloth

bag and drain for several hours. Press out the remaining liquid. Season with salt and pack into a dampened mold. Cover and store in a cold place.

By itself the curd has no distinctive taste. The curd takes on the flavor of other ingredients. Oriental people often use soybean curd with vegetables, meats, or soups. Or it may be added like cheese to omelets, creamed hard-cooked eggs, and many other dishes of that type.

Since the fermented curd has the consistency and somewhat the appearance and flavor of mild soft cheese, it can be seasoned and used as stuffing for celery stalks, green pepper rings, or raw tomatoes. It can be mixed with salad dressing and formed into balls to serve on crisp lettuce or used as a garnish for mixed-vegetable or fruit salad.

The following recipes illustrate how it may be used in hot combinations.

Vegetable Chowder with Soybean Curd

2 cups diced soybean curd	1 tablespoon flour
2 cups diced carrots	1 pint milk
1 pint boiling water	Salt and pepper to taste
½ cup diced salt pork	2 tablespoons chopped parsley

Cook the carrots in boiling water until tender. Fry the salt pork until crisp, remove from fat, and cook the onion and diced curd in the fat until lightly brown. Mix the flour with a little milk until smooth and combine all the ingredients in the upper part of a double boiler; stir until well blended; cook about 10 minutes.

Chop Suey with Soybean Curd and Bean Sprouts

5 cups diced soybean curd	2 teaspoons cornstarch
½ cup butter or other fat	2 tablespoons cold water
3 cups shredded onions	3 cups bean sprouts
3 cups shredded celery	2 cups sliced jerusalem artichokes
2 cups water	6 tablespoons soysauce

Brown the curd lightly in one-half of the fat and remove from the frying pan. Cook the onion and celery in the remainder of the fat for a few minutes. Add the curd and 2 cups of water and simmer for 5 minutes. Mix the cornstarch and the 2 tablespoons of cold water until smooth. Stir into the mixture and cook for a few minutes longer. Add the bean sprouts and artichokes and heat thoroughly. Add the soysauce and serve.