

Simply SOY

Lesson Plan

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Target group

All ages

Time needed

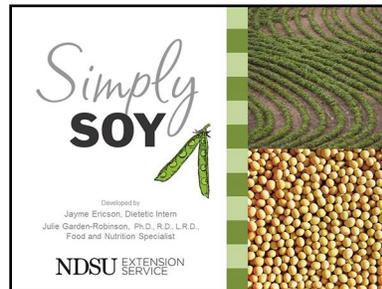
30 to 50 minutes, depending on activities

Objectives

- Participants will be able to identify food sources of soy.
- Participants will know what counts as a serving of soy.
- Participants will know MyPlate recommendations for soy.
- Participants will know how to prepare soy.

Preparation and Supplies

- Copies of handout: "Questions and Answers About Soy Foods," FN1786
- Copies of recipes
- Simply Soy Bingo Kit
- Food packages with soy-containing ingredients
- Taste testing: Prepare a recipe from this lesson for taste testing, soy nuts or soy products, such as edamame (optional).



Slide 1 - Introduction

Introduce yourself and welcome participants.

Welcome to this informational session about soy and its uses in our food supply.

Soy is pivotal to our society and used for much more than just food in our world.

Let's consider a few facts to get us started:

- How many crayons can one acre of soybeans produce? *82,000 crayons*
- What percent of all daily newspapers in the U.S. are printed using soybean oil? *50 percent*



Slide 2 - Products from soy

Question: Which of these products are made from soy?

All of the products are made from soy. A more detailed list is provided on your handout, and we will discuss it later.

Optional activity: *Distribute food packages and look for the health claim and allergen statement.*

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North Dakota State University
Fargo, North Dakota

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What is soy?



Today's Focus Soybeans are a legume native to Asia

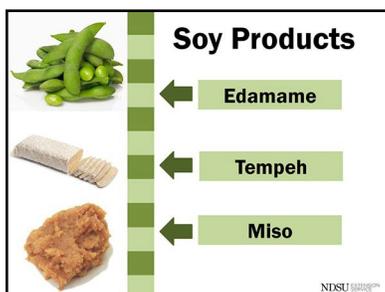
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Slide 3 - What is soy?

Soy is a plant native to Asia and has been a staple in the Asian diet for more than 5,000 years. However, large-scale soybean cultivation did not start in the U.S. until around World War II. Today, the Midwestern U.S. produces about half of the world's supply of soybeans. The popular bean is found in a wide variety of food products from tofu to infant formula, as well as nonfood products such as shampoo, diesel fuel and cosmetics. Soybeans are the only vegetable that contains all eight essential amino acids to make it a complete protein.

Question: Which soy foods have you tried?

Soy Products



Edamame

Tempeh

Miso

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Slide 4 - Soy Products

The next two slides show several soy products. Your handout lists many soy-based foods and has explanations of what these products are.

Edamame (soybeans)

Edamame refers to soybeans that are harvested when still green and sweet. They are high in fiber and protein and have no cholesterol, contrary to meat products. Edamame can be found shelled or unshelled, frozen or fresh, and take little preparation. Simply boiling or roasting the beans for 15 minutes can create a tasty main or side dish to any meal.

Tempeh

Tempeh is an Indonesian-derived food that combines fermented soybeans with a grain such as rice to create a tender, chunky soybean cake. The cakes have a smoky, nutty flavor and serve a variety of uses, including in grilling or as additions to soups and casseroles.

Miso

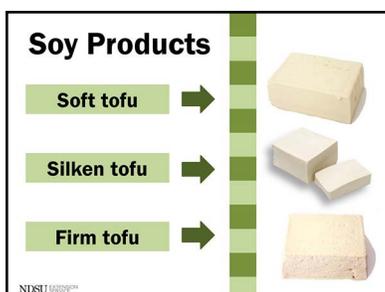
Miso is a fermented soybean product that typically is mixed with rice to result in a thick paste used for sauces, spreads and soups.

Lecithin

Lecithin is a product extracted from soybean oil. It commonly is used as an emulsifier in high-fat products and to promote stabilization, anti-oxidation, crystallization and spatter control.

Tamari: This is gluten-free soy sauce.

Soy Products



Soft tofu

Silken tofu

Firm tofu

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Slide 5 - Soy Products

Tofu

Tofu is a soft, creamy product made from curdling soy milk. Tofu is a naturally bland, high-quality protein that easily takes on the flavor of the food with which it is cooked. Tofu comes in different forms: soft, firm and silken. Soft tofu is best used in blending recipes such as in a smoothie. Firm tofu is great for holding its shape, such as in grilling or in a stir-fry. Silken tofu is used in creamier recipes, such as for replacing sour cream in a dip. Rich in protein, B-vitamins and calcium and low in sodium, tofu offers an alternative to meat products.

These are some additional soy-based foods included on your handout.

Hydrolyzed vegetable protein (HVP)

HVP is the protein from vegetables, typically soybeans, and is used as a flavor enhancer in items such as soups, sauces, flavoring blends, canned and frozen vegetables, meats and poultry.

Soy milk

Soy milk is a fluid produced from soaking and straining soybeans. It can be found in shelf-stable liquid or shelf-stable dry powder form, or refrigerated in the dairy case at your grocery store. Plain, unsweetened soy milk is an excellent alternative to cows' milk and offers high-quality protein and B-vitamins. Soymilk is used to create a variety of products including soy cheese and soy ice cream.

Soynuts

They are whole roasted soybeans with various flavorings.

Soy protein isolates

Although the name sounds derived from a scientific lab, soy protein isolates (or isolated soy protein) essentially are soy flakes. They are a highly refined product designed to get the most protein out of the soybean. Soy protein isolates are 92 percent protein and are highly digestible.

Soy sauce

It is created from soybeans through a fermentation process. It is used widely in Asian and other cuisine. Despite the salty taste, soy sauce actually is lower in sodium than traditional table salt when equal weights of the two items are compared.

Soybean oil

It is derived from the natural oil found in whole soybeans. Oil sold in grocery stores under the name "vegetable oil" usually is 100 percent soybean oil or a blend of soybean oil and other oils. Soybean oil is rich in polyunsaturated fats and naturally cholesterol free.



Slide 6 - Uses of Soy in Food

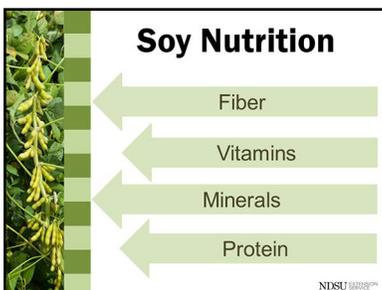
Emulsification/blending: Soy flour and soy protein isolates help blend the fats for a smoother texture and palatability in high-fat foods such as bologna, sausage, breads, cakes, soups and whipped toppings.

Fat absorption: Soy can be used to promote or prevent fat absorption in foods such as bologna, sausage, doughnuts and pancakes.

Water absorption: Soy flour and concentrates help in the uptake and retention of water in food products such as breads, cakes, macaroni and confections.

Texture: Soy flour and soy isolates are used to create viscosity, gelation (solidification by freezing) and fiber formation in foods such as soups, gravies and simulated meat products.

Other uses: Soy is used in a number of ways, including dough formation, cohesion, adhesion, elasticity, color control and aeration.



Slide 7 - Soy Nutrition

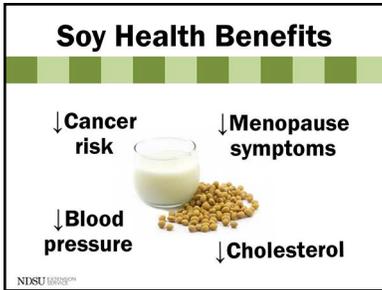
Soy foods are rich in several nutrients, including vitamins and minerals. They also provide protein and fiber.

Fiber: The soybean is rich in fiber: the soluble type that helps reduce cholesterol and the insoluble type that helps keep you regular.

Vitamins: Soy is rich in vitamins such as the B vitamins, which are necessary in energy metabolism in our bodies.

Minerals: Soy is rich in phosphorous and iron. Phosphorous is necessary for cellular growth and production. Iron is crucial for the production of red blood cells and hemoglobin.

Protein: Protein is essential in the building and repair of tissues in the body. Soy provides a healthy dose of tissue-building protein at a lower saturated fat content than average meat products.



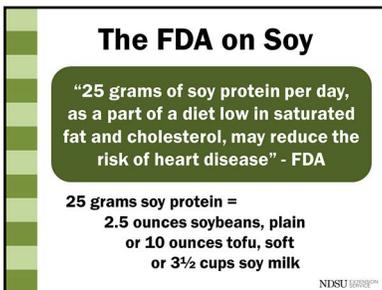
Slide 8 - Soy Health Benefits

Cholesterol: Research indicates soy consumption can decrease LDL cholesterol moderately in humans. This is most beneficial when soy protein is substituted for animal protein in the diet.

Blood pressure: Research shows soy consumption can help lower blood pressure in humans. Research still is needed to determine the best source and preparation of soybeans for this outcome.

Menopause: Research is limited on the relationship between soy consumption and menopause symptom reduction, but conclusions point to a reduction in hot flashes in menopausal women.

Cancer prevention: Research concludes that soy consumption can decrease the risk of breast cancer in women and prevent prostate cancer in men. Because soy contains estrogenlike chemicals, it should be used with caution in hormone-sensitive individuals.



Slide 9 - The FDA on Soy

The Food and Drug Administration (FDA) has authorized the use of a health claim on the association between soy protein and the reduced risk of coronary heart disease (CHD).

The food needs to include 6.25 grams (g) of soy protein per reference amount customarily consumed (RACC), less than 1g of saturated fat per RACC, no more than 15 percent of calories from saturated fat per RACC and less than 20 milligrams of cholesterol per RACC.

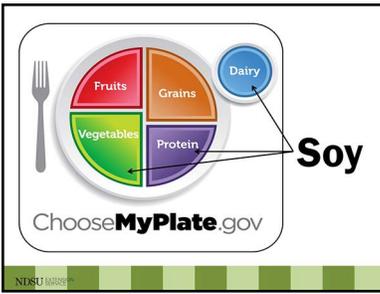
Specifically, the claim needs to state that “soy protein” is the beneficial part that can reduce CHD. Because the protein is the beneficial component, the serving of soy must equal 25 grams of protein from soy, not just 25 grams of soy product. For example, 1 ounce of soybeans is about 25 grams of soybean product but only about 11 grams of protein.

	Reference Diet (used on food labels)	Tofu, firm (1/2 cup)	Soybeans (1/2 cup)	Soy milk, Plain (1 cup)
Calories	2,000	88	155	108
Total fat (g)	Less than 65	5	8	4
Protein (g)	50	10	15	6
Cholesterol (mg)	Less than 300	0	0	0
Fiber (g)	25	1	5	0
Sodium (mg)	Less than 2,400	15	1	115

Slide 10 - Nutrition Information

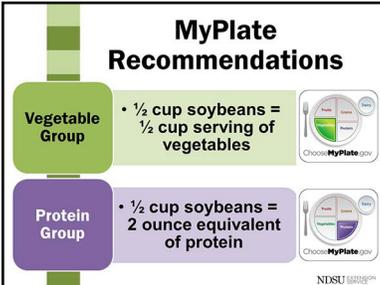
	Tofu, firm (1/2 cup)	Soybeans (1/2 cup)	Soy milk, plain (1 cup)
Calories	88	155	108
Fat (g)	5	8	4
Protein (g)	10	15	6
Cholesterol (mg)	0	0	0
Fiber (g)	1	5	0
Sodium (mg)	15	1	115

Not all soybean sources provide the same macro and micro nutrients. Be sure to read the labels of the soybean source of preference to make sure you are getting the correct amount of nutrients. This is especially important to consider if soy is the replacement for meat protein in the diet.



Slide 11 - Choose MyPlate

Soy qualifies for multiple food groups: protein, vegetable and dairy.

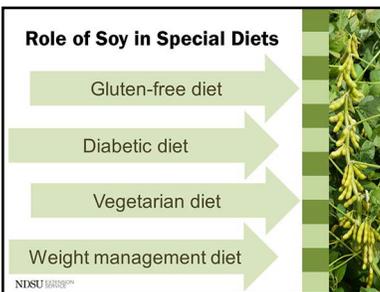


Slide 12 - MyPlate Recommendations

1/2 cup soybeans = 1/2 cup vegetables or 2 ounces protein
(2.5 cups vegetables recommended daily)

1/2 cup cubed firm tofu = 2 ounces protein (5.5 ounces recommended daily)

1 cup soy milk = 1 cup dairy (3 cups recommended daily)



Slide 13 - Role of Soy in Special Diets

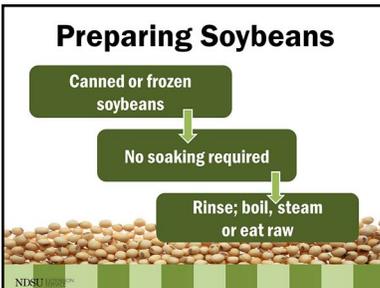
Gluten-free diet: Soybeans contain no gluten (protein found in wheat and some other cereal grains), so people with gluten intolerances (celiac disease) can include soybeans in their recipes.

Diabetic diet: Pulses may help with blood glucose management because of their low glycemic index (measure of how fast carbohydrate-containing foods raise blood sugar levels.) A low glycemic index means soybeans raise blood sugar slowly, compared with foods having a high glycemic index.

Vegetarian diet: Soybeans are a good source of protein, an essential part of the vegetarian diet.

Weight management diet: Soybeans are high in fiber and protein, leading to a feeling of fullness. They are also low in fat.

- When consuming extra fiber, be sure to drink plenty of water.



Slide 14 - Preparing Soybeans

Canned or frozen soybeans need little to no preparation. They do not need to be soaked like dry soybeans. They simply need to be rinsed off and prepared by boiling or steaming. They also can be eaten raw.



Slide 15 - Preparing Soybeans:

Dry soybeans need more preparation but are often less expensive than canned or frozen soybeans. Dry soybeans need to be soaked using the conventional or quick methods.

Soaking: Rinse soybeans thoroughly and drain. For every 1 cup of dried soybeans, add 3 cups of water and 1 teaspoon of salt.

Use any of the cooking methods below:

- **Conventional method:** Soak soybeans overnight or eight to 10 hours. Drain and rinse thoroughly.
- **Quick soak:** In large saucepan, bring soybeans and water to a boil and then reduce to a simmer for two minutes. Remove from heat and let sit for an hour. Drain and rinse.

After soaking, prepare the soybeans using your favorite method such as steaming, boiling or roasting.



Slide 16 - Soy on the Menu

Soy can be a great addition to any meal of the day.

Breakfast

- Mixed-berry fusion smoothie
- Breakfast burrito with tofu
- Cereal with soymilk

Main Dish

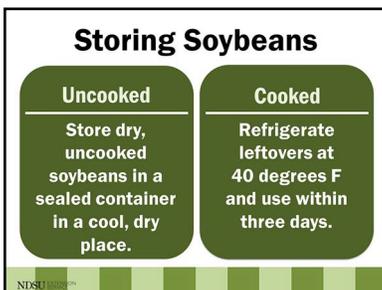
- Edamame bowtie pasta salad
- Cranberry edamame salad
- Soy burger
- Taco salad with tofu crumbles
- Tofu salad sandwich
- Tofu veggie stir fry
- Tempeh

Side Dish

- Crispy parmesan edamame
- Soy and spinach artichoke dip
- Vegetable three-bean soup
- Baked potato with soybean chili

Desserts

- Tofu peanut butter pie
- Tofu mousse



Slide 17 - Storing Soybeans

Uncooked

Store dry, uncooked soybeans in a sealed container in a cool, dry place.

Cooked

Refrigerate leftovers at 40 degrees F and use within three days of cooking.



Slide 18 - Top Ten Reasons to Eat Soy

The benefits of adding soy to your diet, especially in combination with a low saturated fat and cholesterol diet, are endless:

- Excellent source of fiber, B vitamins, protein, phosphorus, iron
- Low fat, sodium, glycemic index
- Gluten-free
- Cholesterol-free

Additional Information

NDSU Extension Service
www.ag.ndsu.edu/food

MyPlate Website
www.choosemyplate.gov

American Soybean Association
<https://soygrowers.com/>

United Soybean Board
www.soyconnection.com/health_nutrition/health-fact-sheets/soy-heart-health/health-claim-guide

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This project was made possible in part with funding from the North Dakota Soybean Council.



Slide 19 - References/additional information:

Visit the NDSU Extension Service website (www.ag.ndsu.edu/food) for more information.

Food and Drug Administration. Code of Federal Regulations Title 21:
www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfcfr/cfrsearch.cfm?fr=101.82

Mayo Clinic:

www.mayoclinic.org/drugs-supplements/soy/background/hrb-20060012

Soyfoods:

www.soyfoods.com/soy-food-descriptions/

U.S. Department of Agriculture:

www.supertracker.usda.gov/foodtracker.aspx

Activities: *Soy Bingo and Taste Testing*

Complete evaluation form.

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