Name of Herb/Supplement
Soy

Scientific name [1,3]
Glycine max (synonym Glycine soja)
Family: Leguminosae (legumes)

Other common names [1-3]
Soya, Soybean, Soy Lecithin, Daidzein, Edemame, Frijol de Soya, Genistein, Haba Soya, Hydrolyzed Soy Protein, Isoflavone, Isoflavones, Legume, Miso, Natto, Phytoestrogen, Plant Estrogen, Shoyu Soja, Sojabohne, Soy Fiber, Soy Milk, Soy Protein, Soy Protein Extract, Soybean Curd, Tempeh, Texturized Vegetable Protein, Tofu.

Description of active ingredients
Soybeans contain oil, carbohydrates, and proteins, as well as stearic, linoleic, and palmitic acids. They are also rich in calcium, iron, potassium, amino acids, vitamins, and fiber. Soy protein usually contains 1-3 mg of isoflavones per gram of soy protein.[3] Isoflavones are structurally molecularly similar to natural body estrogens (phytoestrogen).[2] Also consists of genistein and daidzein, which are the most abundant isoflavone in soybeans.[2]

MOA
When ingested, the isoflavone glucosides genistin and daidzin are hydrolyzed by beta-glucosidases in the jejunum, releasing the isoflavone aglycones genistein and daidzein.[3] Isoflavones are widely distributed in the body and undergoes enterohepatic recycling.[3] They bind estrogen receptors and affect the female reproductive system. Peak concentrations appear at 4-8 hours after dietary intake, and excretion is within 24 hours.[3]

Phytoestrogen Action
The isoflavones in soy are chemically similar to estradiol in the female human body. Soy decreases the frequency and severity of hot flashes in menopausal women.[3]

Osteoporosis Action
Some report that women on soy have a higher bone mineral density (BMD).[3]

Cholesterolemia Action
Studies show a decrease in total serum cholesterol and LDL cholesterol, with a slight increase in HDL cholesterol.[3]

Anticancer Action
Genistein in soy has been found to decrease the growth of tumors implanted in mice.[1] A pilot study results also suggest that soy supplementation decreases levels of oxidative DNA damage in humans.[5]

Current indications and efficacy
Menopause[1,4,6]
Studies document that soy reduces menopausal symptoms and provide an alternative to hormone replacement therapy. Hot flashes decreased by 54% ($P<0.05$) and vaginal dryness decreased by 60% ($P<0.005$) in the phytoestrogen-rich diet group.

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Osteoporosis[3,4,6]
Studies show soy isoflavones attenuate bone loss from the lumbar spine in perimenopausal women. There is a positive effect on change in bone mineral density (BMD) (5.6%, P=0.023).
Dyslipidemia[,4,6]
Soy has been found to lower both LDL and total cholesterol levels. Investigators also found a slight increase in HDL levels. Serum cholesterol concentrations were 9.3% (P <0.001) lower, LDL concentrations were 12.7% (P<0.001) lower, and HDL concentrations were 2.4% higher (P>0.05).
Anticancer[1,4-6]
Most clinical studies have not specifically examined the relation of soy food intake and cancer risk, so definitive data are not available. However, epidemiologic data are moderately supportive of a protective role of soy foods against certain types of cancers. Populations with high intakes of soy foods, such as China and Japan, usually have lower prevalences of cancers of the breast, uterus, prostate, and colon. Isoflavone concentrations in serum and urine are 10-100 folds higher in Asian women than in American women. This supports the potential protective effects of these phtyochemicals.

Contraindications/allergies[1]
No absolute contraindications are known.

Dosage forms, recommended doses, duration
Dosage forms [1,4]
Bean curd, capsules, seitan, soymilk, tofu, soy flour, soy protein
Dosages
1. Menopause Symptom Relief [1,3]
   20-75mg isoflavones po qd
2. Osteoporosis Prevention [1,3]
   40-100g isoflavones po qd
3. Reduction of Cholesterol [1,3]
   20-50g po qd
4. Prostate Cancer [3]
   ≥2 glasses of soymilk qd
5. Diarrhea in infants [3]
   soy fiber fortified formula containing 18-20 g /L

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TABLE 1. Protein and isoflavone contents of selected soy products[6]

	Serving size			Isoflavone content	
Food	Weight	Volume	Protein content	Per protein	Per serving
	g		*g/100 g*	*mg/g protein*	*mg/serving*
Mature soybeans, uncooked	46.5	1/4 cup	37.0	5.1	87.8
Roasted soybeans	43	1/4 cup	35.2	5.5	83.5
Soy flour	21	1/4 cup	37.8	5.5	43.8
Textured soy protein, dry	30	1/4 cup	6.0	5.2	94.0
Green soybeans, uncooked	128	1/2 cup	16.6	3.3	70.1
Soymilk	228	1 cup	4.4	2.0	20.0
Tempeh, uncooked	114	4 oz	17.0	3.1	60.5
Tofu, uncooked	114	4 oz	15.8	2.1	38.3
Soy protein isolate, dry	28	1 oz	92.0	2.2	56.5
Soy concentrate, dry	28	1 oz	63.6	0.3	12.4

[1]Values are representative and presented for illustrative purposes; values were obtained from the published literature and from analyses we obtained for selected products. The isoflavone content varies widely among soybean varieties and from product to product depending on the manufacturing process and source of soy protein—these estimates are our best calculation of isoflavone values provided by currently available products. The following references provide more detailed information about the different isoflavones in specific products: 28, 33, 35–37.

Drug interactions and Drug-Disease interactions[3]

Herb/Drug

Estrogen: Theoretically soy might competitively inhibit the effects of estrogen replacement therapy.

Tamoxifen: There is some concern that soy might interfere with tamoxifen because of its potential estrogenic effects. There is preliminary evidence that soy might antagonize the antitumor effects of tamoxifen. Tell patients taking tamoxifen to avoid using soy products.

Herb/Food

Soy protein isolate reduces the absorption of non-heme iron from foods. Non-heme iron is found in plant-based foods.

Herb/Herb

none known, insufficient data available

Drug/Disease

Asthma: People with asthma are at higher risk for soy hull allergy. The risk and severity of symptoms increase with increased exposure.

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Allergic Rhinitis: Have an increased risk for soy hull allergy. The risk and severity of symptoms increase with increased exposure.
Breast Cancer: Soy has estrogenic properties. Some experts are concerned about the use of soy in women with breast cancer because estrogens can increase this risk. However, some preclinical studies show that soy may have protective effects for breast cancer. Because there is insufficient reliable information about the effects of soy preparations in patients with breast cancer, a history of breast cancer, or a family history of breast cancer, therapeutic use of soy should be done with caution.
Kidney Stones: There is some concern that the high oxalate content of soy may increase the risk of kidney stones.

Other safety issues [1,3]
Likely safe when used orally and appropriately. Soy products of up to 60grams per day have been safely used in studies lasting up to 2 months.
Children: Likely safe when used orally in amounts found in foods. Possibly unsafe when used orally as an alternative to cow's milk in children with severe milk allergy. There is insufficient reliable information available about the safety of soy products when used in amounts higher than typical food quantities for children.
Pregnancy: Likely safe when used orally in amounts found in foods. Possibly unsafe when used orally in medicinal amounts because of estrogenic constituents. Theoretically, therapeutic use of soy might adversely affect fetal development (i.e. feminization of male).

Side effects/adverse reactions [1,3]
Hypersensitivity reactions and GI effects such as nausea, bloating, diarrhea, and abdominal pain.

Other comment
Instruct client to store soy products in a cool, dry place, away from heat and moisture.

References:

1. Skidmore-Roth, Linda. Mosby's Handbook of Herb & Natural Supplements. 2001. pp783-786.
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5. Djuric Z, Chen G, Doerge DR, Heilbrun LK, Kucuk O. Effect of Soy Isoflavone Supplementation on Markers of Oxidative Stress in Men and Women. Cancer Letters. Oct 2001; 172(1): pp1-6.
6. Anderson JW, Smith BM, Washnock CS. Cardiovascular and Renal Benefits of Dry Bean and Soybean Intake. American Journal of Clinical Nutrition. Sep1999; 70(3Suppl): 464S-474S.

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