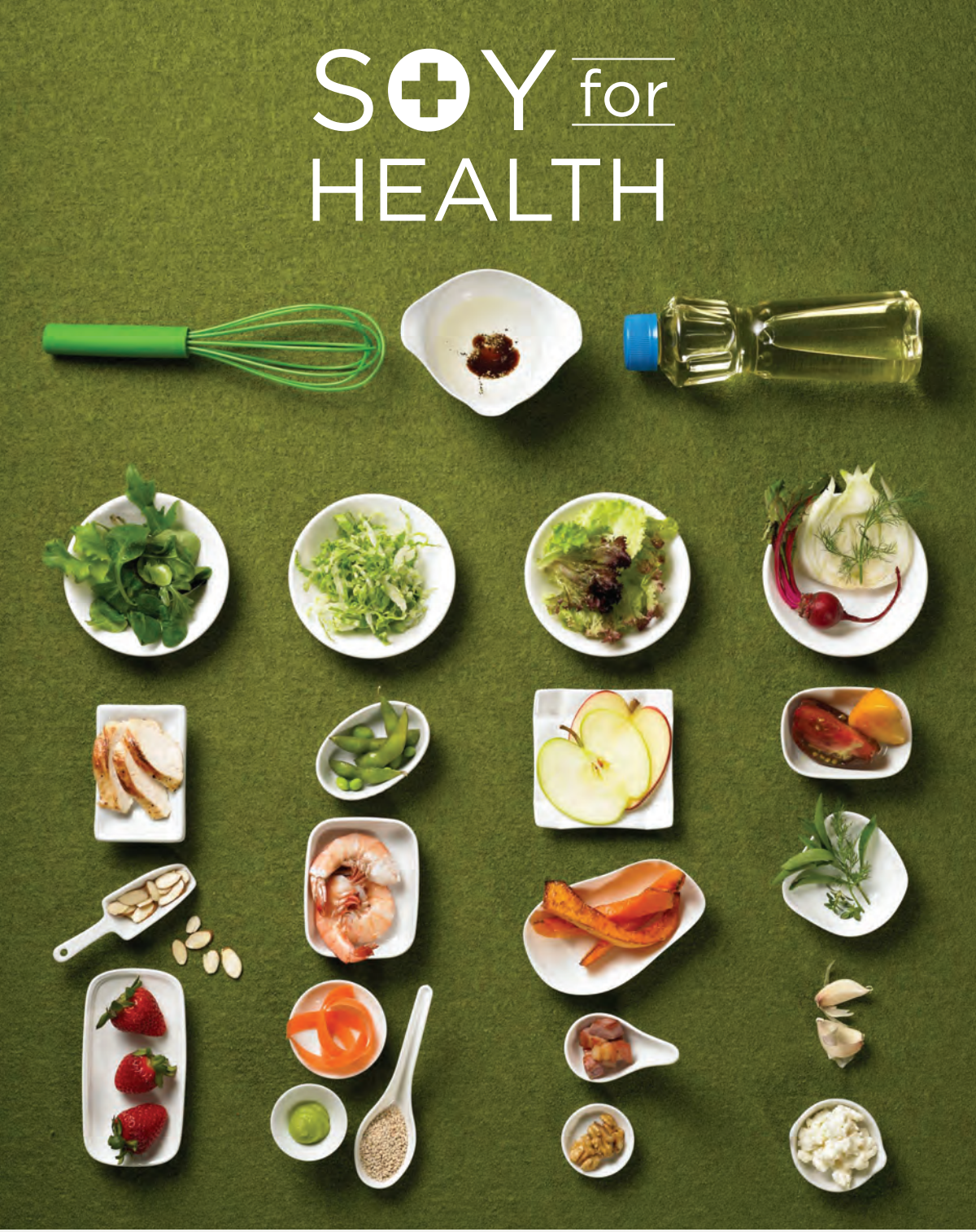
SOY for HEALTH



Make the Soy Connection

SoyConnection
By the United Soybean Board

SOY FOR GOOD HEALTH

Soyfoods have long been important in Asian diets, where they are valued for their nutrient content and culinary versatility. For health-conscious Westerners, soyfoods and other legumes are among the variety of healthful options for meeting protein needs.

Evidence suggests that dietary protein is more satiating than fats and carbohydrate, and therefore potentially beneficial for weight management.[1] Recent data indicates that the recommended dietary allowance (RDA) for protein may be too low and that protein intake exceeding the RDA may be advantageous.[2-4] In fact, the protein RDA for children may be 50 percent lower than what is optimal.[5] Consuming high quality protein, such as soy protein, is important for building and maintaining muscle in response to resistance exercise.[6-10]

Many soyfoods, such as edamame, are good sources of certain vitamins and minerals such as folate and potassium.[11] In addition, like many plant foods, they provide a variety of phytochemicals. These biologically active plant compounds are not essential nutrients, but may confer health benefits. Soyfoods have received particular attention for being uniquely rich sources of one group of phytochemicals called isoflavones. Some soyfoods are also good sources of fiber.[11]

Within the past 15 years, soyfoods have attracted the attention of researchers for their potential to reduce risk of certain chronic diseases. There is evidence indicating that soyfoods may lower risk of coronary heart disease,[12] osteoporosis[13, 14] and certain cancers.[15, 16] They may also help alleviate menopausal symptoms.[17]

Clinical and epidemiologic evidence suggests a reasonable intake of soyfoods is 2-3 servings daily.

CANCER

Governmental institutions and academic laboratories are rigorously investigating the potential for soy to reduce cancer risk. Interest in this area was initially prompted by two observations:

- Soybeans contain a number of purported chemopreventive (anti-cancer) compounds[18] and are essentially unique dietary sources of one class of compounds: isoflavones.[19]
- Rates of certain cancers are quite low in countries where soyfoods are commonly consumed.[20]

BREAST CANCER

Asian populations have much lower rates of breast cancer than Western populations and evidence suggests that soyfood intake may be one reason for this difference. Current thinking is that, to derive the proposed protective effects, soy consumption must occur during childhood or adolescence.[21, 22] Epidemiologic studies indicate that the consumption of just one to two servings of soyfoods per day early in life reduces breast cancer risk by 25 to 50 percent.[23-25] Protection is thought to result from isoflavone-induced changes in the developing breast, which makes breast cells permanently more resistant to being transformed into cancer cells.[22, 26]

PROSTATE CANCER

Animal studies indicate that soy protein and isoflavones suppress the development of spontaneous and chemically-induced prostate cancer.[27] Asian studies have found that men who eat soyfoods regularly are about 30 to 50 percent less likely to develop prostate cancer than those who do not.[15, 28] Also, there is evidence from animal[29] and human[30] studies that soybean isoflavones inhibit both the growth and spread (metastasis) of prostate tumors. Preliminary research also suggests that soy protein and isoflavones may slow the rise in levels of prostate specific antigen (PSA) – an indicator of prostate cancer – in men with prostate cancer.[31-35] However, not all studies show this to be the case.[36, 37] In addition, preliminary research found that isoflavones markedly reduced the side effects associated with radiation treatment for prostate cancer.[38]

SOY MAY REDUCE RISK FOR PROSTATE CANCER AND SLOW TUMOR GROWTH AND SPREAD IN MEN WHO HAVE THE DISEASE.

HEART HEALTH

Coronary heart disease is the number one killer of Americans. Nearly 1.5 million Americans had a heart attack in 2011 and about 400,000 Americans died of coronary heart disease. The number of coronary heart disease deaths was equally divided between men and women.

Lifestyle greatly impacts the likelihood of developing coronary heart disease. The most important risk factors include elevated blood cholesterol, hypertension, diabetes and smoking.[39]

Dietary choices can significantly impact the risk of developing coronary heart disease. Diet is well known to affect blood cholesterol levels and blood pressure as well as other important coronary heart disease risk factors.[76] For example, diet can reduce oxidation and inflammation – two factors that affect the health of the arteries – and can help lower blood triglyceride levels.

To substantially reduce coronary heart disease risk requires making comprehensive dietary changes since no single food will dramatically lower risk. A wealth of evidence indicates that soyfoods can make important contributions to better-for-you diets.

SOYFOODS POTENTIALLY REDUCE CORONARY HEART DISEASE IN THREE WAYS

In 1999, the U.S. Food and Drug Administration approved a health claim for soyfoods due to the ability of soy protein to directly lower blood LDL-cholesterol levels.[40] Estimates vary, but the results of recent meta-analyses indicate that soy protein lowers LDL-cholesterol by approximately 4 - 6 percent.[41-45] Estimates are that each 1 percent decrease in LDL-cholesterol can lower coronary heart disease risk by approximately 1 - 3 percent.[46, 47]

Soyfoods are generally low in saturated fat, high in omega-6 polyunsaturated fat and one of the few plant sources of essential omega-3 fatty acids.[48] Consequently, replacing commonly consumed protein-rich foods in traditional Western diets with soyfoods can improve the fatty acid profile of the diet and, as a result, lower LDL-cholesterol by approximately 4 percent.[49] Furthermore, recent evidence indicates that the ideal substitution for saturated fat is a mixture of omega-6 and omega-3 polyunsaturated fat. Soyfoods are good choices for this replacement since they provide high quality protein and both omega-6 and omega-3 fatty acids.[50]

Several studies have found that Asians who consume 2 - 3 servings of soyfoods daily are as much as 50 percent less likely to have heart disease.[51-53] This degree of protection is far greater than what could be achieved through cholesterol reduction alone. Furthermore, a 3-year intervention study recently found that, in young postmenopausal women, the consumption of isoflavone-rich soy protein inhibited the progression of subclinical atherosclerosis.[54] Clinical studies suggest that soy may reduce coronary heart disease by favorably affecting multiple risk factors independent of elevated LDL-cholesterol levels.

For example, soy has been shown to:

+ Modestly raise HDL-cholesterol[41]
+ Modestly lower fasting and postprandial blood levels of triglycerides[41, 55]
+ Modestly lower blood pressure[56]
+ Make LDL-cholesterol less atherogenic[57]
+ Directly improve the health of the coronary arteries[58]

OSTEOPOROSIS

Soyfoods can be part of a diet that improves bone health. The high quality protein[59] they provide is important for bone health.[60] The calcium in fortified soymilk[61, 62] and calcium-set tofu[63] is absorbed as well as calcium from cow's milk. A recent U.S. prospective epidemiologic study found that the consumption of soymilk and cow's milk equally reduce risk of osteoporosis among postmenopausal women.[14]

There is also interest in the possible skeletal benefits of soybean isoflavones because of their estrogen-like effects. The presence of isoflavones in soyfoods may explain why, in two large Asian epidemiologic studies, soy consumption was associated with about a one-third reduction in fracture risk.[64, 65] However, clinical studies investigating the effects of isoflavones on bone mineral density have produced mixed results, with some studies showing pronounced benefits[66] and others showing relatively little effect.[67] Further, three of the largest and longest trials failed to find that isoflavone supplements affect bone mineral density in postmenopausal women.[67-69]

MENOPAUSE

The observation that Asian women are much less likely to report having hot flashes than Western women led to the hypothesis that soyfoods, because they contain isoflavones, may alleviate menopausal symptoms.[70] More than 50 clinical trials have examined the effect of soyfoods or isoflavone supplements on hot flash frequency and/or severity. Although some recent reviews and analyses of the literature have concluded isoflavone-rich products alleviate hot flashes,[17, 71] most have found that the data do not allow definitive conclusions to be made even though more trials than not showed benefit.[72, 73]

The protein, calcium and perhaps isoflavones in soyfoods are important for maintaining bone health.

However, the most recently conducted statistical analysis of the literature supports the efficacy of isoflavones. This systematic review and meta-analysis, which included 19 and 17 studies, respectively, found that isoflavone supplements consistently reduced both the frequency and severity of hot flashes.[74] When including the placebo response, overall frequency and severity were reduced by about 50 percent. Approximately half of that reduction is attributed to the placebo effect and half from isoflavones. Supplements that contained an isoflavone ratio similar to that found in soybeans produced the largest benefits. The level of relief provided by isoflavones is consistent with the degree of benefit deemed satisfactory by women seeking non-hormonal treatments for hot flashes.[75]

During menopause, women who find that soy alleviates their hot flash frequency or severity generally feel an improvement within just a few weeks.

Researchers publish hundreds of articles in scientific and medical journals each year on the attributes of soyfoods and soybean components.

1. Astrup A. The satiating power of protein--a key to obesity prevention? *Am J Clin Nutr.* 2005; 82: 1-2.
2. Humayun MA, Elango R, Ball RO, Pencharz PB. Reevaluation of the protein requirement in young men with the indicator amino acid oxidation technique. *Am J Clin Nutr.* 2007; 86: 995-1002.
3. Elango R, Humayun MA, Ball RO, Pencharz PB. Evidence that protein requirements have been significantly underestimated. *Curr Opin Clin Nutr Metab Care.* 2010; 13: 52-7.
4. Paddon-Jones D, Rasmussen BB. Dietary protein recommendations and the prevention of sarcopenia. *Curr Opin Clin Nutr Metab Care.* 2009; 12: 86-90.
5. Elango R, Humayun MA, Ball RO, Pencharz PB. Protein requirement of healthy school-age children determined by the indicator amino acid oxidation method. *Am J Clin Nutr.* 2011; 94: 1545-52.
6. Campbell B, Kreider RB, Ziegenfuss T, La Bounty P, Roberts M, Burke D, Landis J, Lopez H, Antonio J. International Society of Sports Nutrition Position Stand: Protein and Exercise. *J Int Soc Sports Nutr.* 2007; 4: 8.
7. Tang JE, Phillips SM. Maximizing muscle protein anabolism: the role of protein quality. *Curr Opin Clin Nutr Metab Care.* 2009; 12: 66-71.
8. DiSilvestro RA, Mattern C, Wood N, Devor ST. Soy protein intake by active young adult men raises plasma antioxidant capacity without altering plasma testosterone. *Nutr Res.* 2006; 26: 92-95.
9. Brown EC, Disilvestro RA, Babaknia A, Devor ST. Soy versus whey protein bars: Effects on exercise training impact on lean body mass and antioxidant status. *Nutr J.* 2004; 3: 22.
10. Hill S, Box W, DiSilvestro RA. Moderate intensity resistance exercise, plus or minus soy intake: effects on serum lipid peroxides in young adult males. *Int J Sport Nutr Exerc Metab.* 2004; 14: 125-32.
11. Messina MJ. Legumes and soybeans: overview of their nutritional profiles and health effects. *Am J Clin Nutr.* 1999; 70: 439S-450S.
12. Messina M, Lane B. Soy protein, soybean isoflavones, and coronary heart disease risk: Where do we stand? *Future Lipidology.* 2007; 2: 55-74.
13. Lagari VS, Levis S. Phytoestrogens and bone health. *Curr Opin Endocrinol Diabetes Obes.* 2010; 17: 546-53.
14. Matthews VL, Knutsen SF, Beeson WL, Fraser GE. Soy milk and dairy consumption is independently associated with ultrasound attenuation of the heel bone among postmenopausal women: the Adventist Health Study-2. *Nutr Res.* 2011; 31: 766-75.
15. Yan L, Spitznagel EL. Soy consumption and prostate cancer risk in men: a revisit of a meta-analysis. *Am J Clin Nutr.* 2009; 89: 1155-63.
16. Wu AH, Yu MC, Tseng CC, Pike MC. Epidemiology of soy exposures and breast cancer risk. *Br J Cancer.* 2008; 98: 9-14.
17. Howes LG, Howes JB, Knight DC. Isoflavone therapy for menopausal flushes: a systematic review and meta-analysis. *Maturitas.* 2006; 55: 203-11.
18. Messina M, Barnes S. The role of soy products in reducing risk of cancer. *J Natl Cancer Inst.* 1991; 83: 541-6.
19. Franke AA, Custer LJ, Wang W, Shi CY. HPLC analysis of isoflavonoids and other phenolic agents from foods and from human fluids. *Proc Soc Exp Biol Med.* 1998; 217: 263-73.
20. Pisani P, Bray F, Parkin DM. Estimates of the world-wide prevalence of cancer for 25 sites in the adult population. *Int J Cancer.* 2002; 97: 72-81.
21. Messina M, Wu AH. Perspectives on the soy-breast cancer relation. *Am J Clin Nutr.* 2009; 89: 1673S-1679S.
22. Messina M, Hilakivi-Clarke L. Early intake appears to be the key to the proposed protective effects of soy intake against breast cancer. *Nutr Cancer.* 2009; 61: 792-798.
23. Shu XO, Jin F, Dai Q, Wen W, Potter JD, Kushi LH, Ruan Z, Gao YT, Zheng W. Soyfood intake during adolescence and subsequent risk of breast cancer among Chinese women. *Cancer Epidemiol Biomarkers Prev.* 2001; 10: 483-8.
24. Korde LA, Wu AH, Fears T, Nomura AM, West DW, Kolonel LN, Pike MC, Hoover RN, Ziegler RG. Childhood soy intake and breast cancer risk in Asian American women. *Cancer Epidemiol Biomarkers Prev.* 2009; 18: 1050-9.
25. Wu AH, Yu MC, Tseng CC, Stanczyk FZ, Pike MC. Dietary patterns and breast cancer risk in Asian American women. *Am J Clin Nutr.* 2009; 89: 1145-54.
26. Hilakivi-Clarke L, Andrade JE, Helferich W. Is Soy Consumption Good or Bad for the Breast? *J Nutr.* 2010; 140: 2326S-34S.
27. Pollard M, Suckow MA. Dietary prevention of hormone refractory prostate cancer in Lobund-Wistar rats: a review of studies in a relevant animal model. *Comp Med.* 2006; 56: 461-7.
28. Hwang YW, Kim SY, Jee SH, Kim YN, Nam CM. Soy food consumption and risk of prostate cancer: a meta-analysis of observational studies. *Nutr Cancer.* 2009; 61: 598-606.
29. Lakshman M, Xu L, Ananthanarayanan V, Cooper J, Takimoto CH, Helenowski I, Pelling JC, Bergan RC. Dietary genistein inhibits metastasis of human prostate cancer in mice. *Cancer Res.* 2008; 68: 2024-32.
30. Xu L, Ding Y, Catalona WJ, Yang XJ, Anderson WF, Jovanovic B, Wellman K, Killmer J, Huang X, et al. MEK4 function, genistein treatment, and invasion of human prostate cancer cells. *J Natl Cancer Inst.* 2009; 101: 1141-55.
31. Messina M, Kucuk O, Lampe JW. An overview of the health effects of isoflavones with an emphasis on prostate cancer risk and prostate-specific antigen levels. *J AOAC Int.* 2006; 89: 1121-34.
32. Pendleton JM, Tan WW, Anai S, Chang M, Hou W, Shiverick KT, Rosser CJ. Phase II Trial of Isoflavone in prostate specific antigen recurrent prostate cancer after previous local therapy. *BMC Cancer.* 2008; 8: 132.
33. Kwan W, Duncan G, Van Patten C, Liu M, Lim J. A phase II trial of a soy beverage for subjects without clinical disease with rising prostate-specific antigen after radical radiation for prostate cancer. *Nutr Cancer.* 2010; 62: 198-207.
34. Ide H, Tokiwa S, Sakamaki K, Nishio K, Isotani S, Muto S, Hama T, Masuda H, Horie S. Combined inhibitory effects of soy isoflavones and curcumin on the production of prostate-specific antigen. *Prostate.* 2010; 70: 1127-33.
35. Joshi M, Agostino NM, Gingrich R, Drabick JJ. Effects of commercially available soy products on PSA in androgen-deprivation-naive and castration-resistant prostate cancer. *South Med J.* 2011; 104: 736-40.
36. Devere White RW, Tsodikov A, Stapp EC, Soares SE, Fujii H, Hackman RM. Effects of a high dose, aglycone-rich soy extract on prostate-specific antigen and serum isoflavone concentrations in men with localized prostate cancer. *Nutr Cancer.* 2010; 62: 1036-43.
37. Sharma P, Wisniewski A, Braga-Basaria M, Xu X, Yep M, Denmeade S, Dobs AS, DeWeese T, Carducci M, et al. Lack of an effect of high dose isoflavones in men with prostate cancer undergoing androgen deprivation therapy. *J Urol.* 2009; 182: 2265-72.
38. Ahmad IU, Forman JD, Sarkar FH, Hillman GG, Heath E, Vaishampayan U, Cher ML, Andic F, Rossi PJ, et al. Soy isoflavones in conjunction with radiation therapy in patients with prostate cancer. *Nutr Cancer.* 2010; 62: 996-1000.
39. Greenland P, Knoll MD, Stamler J, Neaton JD, Dyer AR, Garside DB, Wilson PW. Major risk factors as antecedents of fatal and nonfatal coronary heart disease events. *JAMA.* 2003; 290: 891-7.
40. Food Labeling: Health Claims; Soy Protein and Coronary Heart Disease. Federal Register: (Volume 64, Number 206)], 1999:57699-57733.
41. Zhan S, Ho SC. Meta-analysis of the effects of soy protein containing isoflavones on the lipid profile. *Am J Clin Nutr.* 2005; 81: 397-408.
42. Harland JI, Haffner TA. Systematic review, meta-analysis and regression of randomised controlled trials reporting an association between an intake of circa 25 g soya protein per day and blood cholesterol. *Atherosclerosis.* 2008; 200: 13-27.
43. Reynolds K, Chin A, Lees KA, Nguyen A, Bujnowski D, He J. A meta-analysis of the effect of soy protein supplementation on serum lipids. *Am J Cardiol.* 2006; 98: 633-40.
44. Anderson JW, Bush HM. Soy protein effects on serum lipoproteins: A quality assessment and meta-analysis of randomized, controlled studies. *J Am Coll Nutr.* 2011; 30: 79-91.
45. Jenkins DJ, Mirrahimi A, Srichaikul K, Berryman CE, Wang L, Carleton A, Abdulnour S, Sievenpiper JL, Kendall CW, et al. Soy protein reduces serum cholesterol by both intrinsic and food displacement mechanisms. *J Nutr.* 2010; 140: 2302S-2311S.
46. Law MR, Wald NJ, Thompson SG. By how much and how quickly does reduction in serum cholesterol concentration lower risk of ischaemic heart disease? *BMJ.* 1994; 308: 367-72.
47. Law MR, Wald NJ, Wu T, Hackshaw A, Bailey A. Systematic underestimation of association between serum cholesterol concentration and ischaemic heart disease in observational studies: data from the BUPA study. *BMJ.* 1994; 308: 363-6.
48. Wu Z, Rodgers RP, Marshall AG. Characterization of vegetable oils: detailed compositional fingerprints derived from electrospray ionization fourier transform ion cyclotron resonance mass spectrometry. *J Agric Food Chem.* 2004; 52: 5322-8.
49. Jenkins DJ, Mirrahimi A, Srichaikul K, Berryman CE, Wang L, Carleton A, Abdulnour S, Sievenpiper JL, Kendall CW, et al. Soy protein reduces serum cholesterol by both intrinsic and food displacement mechanisms. *J Nutr.* 2010; 140: 302S-11S.
50. Ramsden CE, Hibbeln JR, Majchrzak SF, Davis JM. n-6 Fatty acid-specific and mixed polyunsaturate dietary interventions have different effects on CHD risk: a meta-analysis of randomised controlled trials. *Br J Nutr.* 2010; 104: 1586-600.
51. Zhang X, Shu XO, Gao YT, Yang G, Li Q, Li H, Jin F, Zheng W. Soy food consumption is associated with lower risk of coronary heart disease in Chinese women. *J Nutr.* 2003; 133: 2874-8.
52. Zhang B, Chen YM, Huang LL, Zhou XX, Chen CG, Ye YB, Su YX. Greater habitual soyfood consumption is associated with decreased carotid intima-media thickness and better plasma lipids in Chinese middle-aged adults. *Atherosclerosis.* 2008; 198: 403-11.
53. Kokubo Y, Iso H, Ishihara J, Okada K, Inoue M, Tsugane S. Association of dietary intake of soy, beans, and isoflavones with risk of cerebral and myocardial infarctions in Japanese populations: the Japan Public Health Center-based (JPHC) study cohort I. *Circulation.* 2007; 116: 2553-62.
54. Hodis HN, Mack WJ, Kono N, Azen SP, Shoupe D, Hwang-Levine J, Petitti D, Whitfield-Maxwell L, Yan M, et al. Isoflavone soy protein supplementation and atherosclerosis progression in healthy postmenopausal women: a randomized controlled trial. *Stroke.* 2011; 42: 3168-75.
55. Santo AS, Santo AM, Browne RW, Burton H, Leddy JJ, Horvath SM, Horvath PJ. Postprandial lipemia detects the effect of soy protein on cardiovascular disease risk compared with the fasting lipid profile. *Lipids.* 2010; 45: 1127-38.
56. Dong JY, Tong X, Wu ZW, Xun PC, He K, Qin LQ. Effect of soya protein on blood pressure: a meta-analysis of randomised controlled trials. *Br J Nutr.* 2011; 106: 317-26.
57. Desroches S, Mauger JF, Ausman LM, Lichtenstein AH, Lamarche B. Soy protein favorably affects LDL size independently of isoflavones in hypercholesterolemic men and women. *J Nutr.* 2004; 134: 574-9.
58. Li SH, Liu XX, Bai YY, Wang XJ, Sun K, Chen JZ, Hui RT. Effect of oral isoflavone supplementation on vascular endothelial function in postmenopausal women: a meta-analysis of randomized placebo-controlled trials. *Am J Clin Nutr.* 2010; 91: 480-6.
59. Rand WM, Pellett PL, Young VR. Meta-analysis of nitrogen balance studies for estimating protein requirements in healthy adults. *Am J Clin Nutr.* 2003; 77: 109-27.
60. Jesudason D, Clifton P. The interaction between dietary protein and bone health. *J Bone Miner Metab.* 2011; 29: 1-14.
61. Zhao Y, Martin BR, Weaver CM. Calcium bioavailability of calcium carbonate fortified soymilk is equivalent to cow's milk in young women. *J Nutr.* 2005; 135: 2379-82.
62. Tang AL, Walker KZ, Wilcox G, Strauss BJ, Ashton JF, Stojanovska L. Calcium absorption in Australian osteopenic post-menopausal women: an acute comparative study of fortified soymilk to cows' milk. *Asia Pac J Clin Nutr.* 2010; 19: 243-9.
63. Weaver CM, Heaney RP, Connor L, Martin BR, Smith DL, Nielsen E. Bioavailability of calcium from tofu vs. milk in premenopausal women. *J Food Sci.* 2002; 68: 3144-3147.
64. Koh WP, Wu AH, Wang R, Ang LW, Heng D, Yuan JM, Yu MC. Gender-specific associations between soy and risk of hip fracture in the Singapore Chinese Health Study. *Am J Epidemiol.* 2009; 170: 901-9.
65. Zhang X, Shu XO, Li H, Yang G, Li Q, Gao YT, Zheng W. Prospective cohort study of soy food consumption and risk of bone fracture among postmenopausal women. *Arch Intern Med.* 2005; 165: 1890-5.
66. Marini H, Bitto A, Altavilla D, Burnett BP, Polito F, Di Stefano V, Minutoli L, Atteritano M, Levy RM, et al. Breast safety and efficacy of genistein aglycone for postmenopausal bone loss: a follow-up study. *J Clin Endocrinol Metab.* 2008; 93: 4787-96.
67. Alekel DL, Van Loan MD, Koehler KJ, Hanson LN, Stewart JW, Hanson KB, Kurzer MS, Peterson CT. The soy isoflavones for reducing bone loss (SIRBL) study: a 3-y randomized controlled trial in postmenopausal women. *Am J Clin Nutr.* 2010; 91: 218-30.
68. Levis S, Strickman-Stein N, Ganjei-Azar P, Xu P, Doerge DR, Krischer J. Soy isoflavones in the prevention of menopausal bone loss and menopausal symptoms: A randomized, double-blind trial. *Arch Intern Med.* 2011; 171: 1363-9.
69. Tai TY, Tsai KS, Tu ST, Wu JS, Chang CI, Chen CL, Shaw NS, Peng HY, Wang SY, et al. The effect of soy isoflavone on bone mineral density in postmenopausal Taiwanese women with bone loss: a 2-year randomized double-blind placebo-controlled study. *Osteoporos Int.* 2012; 23: 1571-80.
70. Adlercreutz H, Hamalainen E, Gorbach S, Goldin B. Dietary phyto-oestrogens and the menopause in Japan. *Lancet.* 1992; 339: 1233.
71. Messina M, Hughes C. Efficacy of soyfoods and soybean isoflavone supplements for alleviating menopausal symptoms is positively related to initial hot flush frequency. *J Med Food.* 2003; 6: 1-11.
72. Jacobs A, Wegewitz U, Sommerfeld C, Grossklaus R, Lampen A. Efficacy of isoflavones in relieving vasomotor menopausal symptoms - A systematic review. *Mol Nutr Food Res.* 2009; 53: 1084-97.
73. Lethaby A, Brown J, Marjoribanks J, Kronenberg F, Roberts H, Eden J. Phytoestrogens for vasomotor menopausal symptoms. *Cochrane Database Syst Rev.* 2007: CD001395.
74. Messina M, Watanabe S, Setchell KD. Report on the 8th International Symposium on the Role of Soy in Health Promotion and Chronic Disease Prevention and Treatment. *J Nutr.* 2009; 139: 796S-802S.
75. Butt DA, Deng LY, Lewis JE, Lock M. Minimal decrease in hot flashes desired by postmenopausal women in family practice. *Menopause.* 2007; 14: 203-207
76. Das UN (2006) Essential Fatty acids - a review. Current pharmaceutical biotechnology 7:467-82. The American Heart Association Nutrition Committee. Circulation 114:82-96.

ABOUT USB

The 69 farmer-directors of USB oversee the investments of the soy checkoff to maximize profit opportunities for all U.S. soybean farmers. These volunteers invest and leverage checkoff funds to increase the value of U.S. soy meal and oil, to ensure U.S. soybean farmers and their customers have the freedom and infrastructure to operate, and to meet the needs of U.S. soy's customers. As stipulated in the federal Soybean Promotion, Research and Consumer Information Act, the USDA Agricultural Marketing Service has oversight responsibilities for USB and the soy checkoff.

ONLINE RESOURCES

Help your clients and patients make the soy connection for better health. Access peer-reviewed, fully-referenced technical bulletins on a variety of health topics, plus delicious healthy recipes, through USB's Web site.
For more information, please visit: SoyConnection.com.

USB
UNITED SOYBEAN BOARD

3322-092513-2500