Harnessing Soy Nutrition & Health Research for Consumer Guidance

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Harnessing Soy Nutrition & Health Research for Consumer Guidance

- Macronutrient composition
- Coronary heart disease
- Isoflavones
- Breast cancer
- Depression
- Misinformation
Macronutrient Composition

VS.
## Macronutrient (% calories) Composition of Soybeans in Comparison to Common Beans

<table>
<thead>
<tr>
<th>Macronutrient</th>
<th>Soybeans</th>
<th>Common beans</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbohydrate</td>
<td>27*</td>
<td>70</td>
</tr>
<tr>
<td>Protein</td>
<td>33</td>
<td>27</td>
</tr>
<tr>
<td>Fat</td>
<td>40</td>
<td>3</td>
</tr>
</tbody>
</table>

*Mostly oligosaccharides (indigestible)
Capable of functioning as prebiotics

 AJCN 70: 439S, 1999
Protein Quality Scores*

- Egg white: 1.00
- Milk (casein): 1.00
- Soy: 1.00
- Beef: 0.92
- Pea protein: 0.73
- Kidney beans: 0.68
- Pinto beans: 0.63
- Rolled oats: 0.57
- Rice: 0.53
- Peanut meal: 0.52
- Whole wheat: 0.40
- Wheat gluten: 0.25
- Almond: 0.23

Highest score = 1.0 (truncated)

*Protein Digestibility Corrected Amino Acid Score (PDCAAS)
Macronutrient (% calories)
Composition of Soybeans in Comparison to Common Beans

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*Mostly oligosaccharides (indigestible)
Capable of functioning as prebiotics

AJCN 70: 439S, 1999
### Fatty Acid Composition of Soybean Oil

<table>
<thead>
<tr>
<th>Fatty acid</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saturated</td>
<td>12</td>
</tr>
<tr>
<td>Monounsaturated</td>
<td>29</td>
</tr>
<tr>
<td>Omega-6 PUFA (LA)*</td>
<td>53</td>
</tr>
<tr>
<td>Omega-3 PUFA (ALA)*</td>
<td>6</td>
</tr>
</tbody>
</table>

*Essential fatty acids. LA, linoleic acid; ALA, α-linolenic acid

Harnessing Soy Nutrition & Health Research for Consumer Guidance

- Macronutrient composition
- **Coronary heart disease**
- Isoflavones
- Breast cancer
- Depression
- Misinformation
Coronary Heart Disease Risk Factors

- ↑ Homocysteine
- Impaired endothelial function (FMD)
- Hypertension
- Inflammation (CRP)
- Lipid abnormalities
  - ↑ LDL-C
  - ↓ HDL-C
  - ↑ TG
- ↑ LDL-Oxidation
- Arterial stiffness
- ↑ Platelet aggregation
Coronary Heart Disease Risk Factors

- Homocysteine
- Impaired endothelial function (FMD)
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- Lipid abnormalities
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- Platelet aggregation
Coronary Heart Disease Risk Factors

- **Impaired endothelial function (FMD)**
- **Homocysteine**
- **Hypertension**
- **Inflammation (CRP)**
- **Lipid abnormalities**
  - \[\uparrow \text{LDL-C} \quad \downarrow \text{HDL-C} \quad \uparrow \text{TG}\]
- **Arterial stiffness**
- **LDL-Oxidation**
- **Platelet aggregation**
Dietary Carbohydrates and Low Cholesterol Diets: Effects on Serum Lipids of Man$^1,2$


Am J Clin Nutr 20, 198-208, 1967

Despite extensive epidemiologic studies, uncounted animal experiments, and many human investigations of dietary factors which might relate to coronary atherosclerosis, there remains a considerable difference of opinion regarding the relative importance of fats, cholesterol, proteins, and carbohydrates in the diet of man. The pioneering epidemiologic studies of Keys (1) and others (2) tended to incriminate fats, particularly saturated fats, and more recently myristic and palmitic acids (3). Indeed, Keys’ group be expressed by a formula: change in cholesterol = 1.5 \((Z_2 - Z_1)\) where \(Z_1\) and \(Z_2\) are the square roots of the milligrams of cholesterol per 1,000 calories of each of two diets.

Yet even these elegant mathematical calculations sometimes fail to explain simple facts; for example, why does the average person in the Orient have such a low concentration of cholesterol and of triglycerides in his blood? Is this a racial difference, is it related to his expenditure of physical energy, or can it best be explained by diet alone?
Effects of Isolated Soy Protein on Serum Cholesterol in Six Healthy Men

mg/dl

Soybean protein

weeks on study

AJCN 20: 198, 1967
Soya products and serum lipids: a meta-analysis of randomised controlled trials

Oluwabunmi A. Tokede1,2,*, Temilola A. Onabanjo3, Alfa Yansane2, J. Michael Gaziano1,2,4 and Luc Djousse1,2,4

1Department of Medicine, Brigham and Women’s Hospital, Boston, MA 02120, USA
2Harvard School of Dental Medicine, Boston, MA 02115, USA
3Jacobi Medical Center, Albert Einstein College of Medicine, Bronx, NY 10461, USA
4Massachusetts Veterans Epidemiology and Research Information Center and Geriatric Research, Education and Clinical Center, Boston Veteran Affairs Healthcare System, Boston, MA 02130, USA

(Submitted 25 November 2014 – Final revision received 6 May 2015 – Accepted 9 June 2015 – First published online 13 August 2015)

Abstract
Soya proteins and isoflavones have been reported to exert beneficial effects on the serum lipid profile. More recently, this claim is being challenged. The objective of this study was to comprehensively examine the effects of soya consumption on the lipid profile using published trials. A detailed literature search was conducted via MEDLINE (from 2004 through February 2014), CENTRAL (The Cochrane Controlled Clinical Trials Register) and ClinicalTrials.gov for randomised controlled trials assessing the effects of soya on the lipid profile. The primary effect measure was the difference in means of the final measurements between the intervention and control groups. In all, thirty-five studies (fifty comparisons) were included in our analyses. Treatment duration ranged from 4 weeks to 1 year. Intake of soya products resulted in a significant reduction in serum LDL-cholesterol concentration, –4-83 (95% CI –7-34, –2-31) mg/dl, TAG, –4-92 (95% CI –7-79, –2-04) mg/dl, and total cholesterol (TC) concentrations, –5-33 (95% CI –8-35, –2-30) mg/dl. There was also a significant increase in serum HDL-cholesterol concentration, 1-40 (95% CI 0-58, 2-23) mg/dl. The I² statistic ranged from 92 to 99%, indicating significant heterogeneity. LDL reductions were more marked in hypercholesterolaemic patients, –7-47 (95% CI –11-79, –3-16) mg/dl, than in healthy subjects, –2-96 (95% CI –5-28, –0-65) mg/dl. LDL reduction was stronger when whole soya products (soya milk, soyabeans and nuts) were used as the test regimen, –11-06 (95% CI –15-74, –6-37) mg/dl, as opposed to when ‘processed’ soya extracts, –3-17 (95% CI –5-75, –0-58) mg/dl, were used. These data are consistent with the beneficial effects of soya proteins on serum LDL, HDL, TAG and TC concentrations. The effect was stronger in hypercholesterolaemic subjects. Whole soya foods appeared to be more beneficial than soya supplementation, whereas isoflavone supplementation had no effects on the lipid profile.

Key words: Hypercholesterolaemia: Lipids: Nutrition: Prevention: Heart disease
Soy Protein and Serum Lipids (% change): Meta-analysis of Randomized Clinical Trials

BJN. 114, 831-843, 2015

LDL-cholesterol  Triglycerides  HDL-cholesterol

All: 50 studies, N=3,366; At risk: 32 studies.
Soy Protein and Serum Lipids (% change): Meta-analysis of Randomized Clinical Trials

BJN. 114, 831-843, 2015

LDL-cholesterol: -4.83
Triglycerides: -4.92
HDL-cholesterol: 1.40

All: 50 studies, N=3,366; At risk: 32 studies. All changes significant.
Soy Protein and Serum Lipids (% change): Meta-analysis of Randomized Clinical Trials

All: 50 studies, N=3,366; At risk: 32 studies. All changes significant

LDL-cholesterol  Triglycerides  HDL-cholesterol

-4.83  -4.92  -3.91  1.40  1.15
The Combined Effects of Soy on LDL-Cholesterol and Risk of Coronary Heart Disease

**Direct**
(Soy protein)

4%

**Indirect**
(replacing saturated fat with polyunsaturated fat)

4%

LDL-C

(8-16% risk)

(in theory)

J Nutr 140: 2302S, 2010
Soy and Blood Pressure
Soy protein: The next antihypertensive agent?


**Background:** The prevalence of hypertension continues to increase dramatically in developing countries. Worldwide, an estimated 1 billion individuals are hypertensive; there is therefore great interest in identifying the lifestyle factors (e.g., weight and salt and alcohol intake) that affect blood pressure. Dietary potassium supplementation, for example, has been shown to reduce blood pressure in patients with either high-normal pressure or hypertension. Observational studies have shown that dietary vegetable (but not animal) protein is associated with lower blood pressures; but until lar except for dietary protein (49.0 g v. 12.9 g, respectively) and carbohydrates (64.8 g v. 95.3 g). The primary outcomes were changes in blood pressure between baseline and week 12 of follow-up. Analysis included the assessment of outcomes on an intention-to-treat basis.

**Results:** After 12 weeks, systolic blood pressures in the intervention group dropped by a mean of 4.31 (95% confidence interval [CI] 2.11–6.51) mm Hg more than in the control group; diastolic pressures, by 2.76 (95% CI 1.35–4.16) mm Hg more. Side effects were unremarkable influence blood pressure.

Prevention is a prominent motivation for dietary change, and this study does not help to settle whether intake of soy protein can prevent hypertension. And although the addition of soy protein in this study resulted in no adverse events, it is not without long-term risk: observational studies in Singapore and Shanghai showed a statistically significant increased risk of bladder cancer among people who consume soy. The weakness of the evidence that soy protein is beneficial to people with blood pressures in the high-normal range shows that longer-term studies are required before practical recommendations can be made.
Effect of soya protein on blood pressure: a meta-analysis of randomised controlled trials

Jia-Yi Dong¹, Xing Tong¹, Zhi-Wei Wu¹, Peng-Cheng Xun²,³, Ka He² and Li-Qiang Qin¹

¹Department of Nutrition and Food Hygiene, School of Radiation Medicine and Public Health, Soochow University, Suzhou, People’s Republic of China
²Department of Nutrition, Gillings School of Global Public Health and School of Medicine, University of North Carolina at Chapel Hill, Chapel Hill, NC 27599, USA
³Department of Epidemiology and Biostatistics, School of Public Health, Nantong University, Nantong, People’s Republic of China

(Received 16 August 2010 – Revised 4 January 2011 – Accepted 10 January 2011 – First published online 23 February 2011)

Abstract

Observational studies have indicated that soya food consumption is inversely associated with blood pressure (BP). Evidence from randomised controlled trials (RCT) on the BP-lowering effects of soya protein intake is inconclusive. We aimed to evaluate the effectiveness of soya protein intake in lowering BP. The PubMed database was searched for published RCT in the English language through to April 2010, which compared a soya protein diet with a control diet. We conducted a random-effects meta-analysis to examine the effects of soya protein on BP. Subgroup and meta-regression analyses were performed to explore possible explanations for heterogeneity among trials. Meta-analyses of twenty-seven RCT showed a mean decrease of 2.21 mmHg (95% CI −4.10, −0.33; P= 0.021) for systolic BP (SBP) and 1.44 mmHg (95% CI −2.56, −0.31; P= 0.012) for diastolic BP (DBP), comparing the participants in the soya protein group with those in the control group. Soya protein consumption significantly reduced SBP and DBP in both hypertensive and normotensive subjects, and the reductions were markedly greater in hypertensive subjects. Significant and greater BP reductions were also observed in trials using carbohydrate, but not milk products, as the control diet. Meta-regression analyses further revealed a significantly inverse association between pre-treatment BP and the level of BP reductions. In conclusion, soya protein intake, compared with a control diet, significantly reduces both SBP and DBP, but the BP reductions are related to pre-treatment BP levels of subjects and the type of control diet used as comparison.

Key words: Soya protein: Isoflavones: Blood pressure: Hypertension
Effects of Soy Protein on Blood Pressure*: Meta-analysis of Randomized Clinical Trials

All trials (n=27)  Blinded trials (n=15)

Systolic  Diastolic

mm Hg

BJN 106: 317, 2011
Effects of Soy Protein on Blood Pressure*: Meta-analysis of Randomized Clinical Trials

Values = difference between control & soy. All values statistically significant.
Effects of Soy Protein on Blood Pressure*: Meta-analysis of Randomized Clinical Trials

Values = difference between control & soy. All values statistically significant.
Soy, Blood Pressure and Cardiovascular Disease

- 2.5 mm Hg SBP
- 1.5 mm Hg DBP
- 10% stroke
- 5% CHD
- 4% mortality

J Hypertens Suppl 23, S3–S8., 2005
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Isoflavones

Naturally-occurring plant chemicals

>20,000 peer-reviewed publications
Isoflavones

- Soyfoods are uniquely rich sources
Mean Daily Isoflavone Intake

<3 mg

30-50 mg

Traditional soyfoods:
3-4 mg/g protein
One serving ~25 mg
Isoflavones

- Soyfoods are uniquely rich sources
- Phytoestrogens but *different* from estrogen
- Sometimes effects *opposite* to estrogen
Cholesterol (animal foods)

↑ Blood cholesterol

Phytosterols (plant foods)

↓ Blood cholesterol
Isoflavones

- Soyfoods are uniquely rich sources
- Phytoestrogens but *different* from estrogen
- Sometimes effects *opposite* to estrogen
- Sometimes *no effects* in estrogen-sensitive tissues
- Estrogen-independent effects
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Age-Adjusted Breast Cancer Incidence Rates (per 100,000) for Selected Countries

- China: 19.1
- Japan: 19.7
- India: 20.8
- Finland: 44.7
- Sweden: 60.7
- Basle: 72.1
- USA: 87.0

BCa: Shanghai, Osaka, Madras, Geneva, San Francisco (W).
Age-Adjusted Breast Cancer Incidence Rates (per 100,000) for Miyagi Prefecture, Japan, 1959-97

Age-Adjusted Breast Cancer Incidence Rates (per 100,000) for Miyagi Prefecture, Japan, 1959-97

Westernization

Year of diagnosis

Hypothesis

Early Soy (Isoflavone) Intake Decreases Breast Cancer Risk
Hypothesis: Early Soy (Isoflavone) Intake Decreases Breast Cancer Risk

Support:
- Rodent data
- Epidemiologic data
- Proposed mechanisms
Hypothesis

Early Soy (Isoflavone) Intake Decreases Breast Cancer Risk

Support

- Rodent data
- Epidemiologic data
- Proposed mechanisms
Early Soy Intake and BCa Risk: Summary of Retrospective Studies

High vs low soy intake during adolescence

<table>
<thead>
<tr>
<th>Author/Y</th>
<th>Location</th>
<th>(N)</th>
<th>Risk % ↓</th>
<th>Statistically Significant?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shu, 2001</td>
<td>China</td>
<td>3,015</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wu, 2009</td>
<td>USA</td>
<td>345</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Korde, 2009</td>
<td>USA</td>
<td>250</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baglia, 2016</td>
<td>China</td>
<td>36,297</td>
<td></td>
<td></td>
</tr>
</tbody>
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*Premenopausal only Ref.: Shu: CEBP;10:483, 2001; Wu: AJCN 89: 1145, 2009; Korde: CEBP 18: 1050, 2009; Int J Cancer 139: 742, 2016 *(95% CI: 0.31, 1.00)*
**Early Soy Intake and BCa Risk: Summary of Retrospective Studies**

**High vs low soy intake during adolescence**

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<tr>
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<td>USA</td>
<td>345</td>
<td>28</td>
<td>Yes</td>
</tr>
<tr>
<td>Korde, 2009</td>
<td>USA</td>
<td>250</td>
<td>60</td>
<td>Yes</td>
</tr>
<tr>
<td>Baglia, 2016</td>
<td>China</td>
<td>36,297</td>
<td>44*</td>
<td>Not quite</td>
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</tbody>
</table>

*Premenopausal only Ref.: Shu: CEBP;10:483, 2001; Wu: AJCN 89: 1145, 2009; Korde: CEBP 18: 1050, 2009; Int J Cancer 139: 742, 2016 *(95% CI: 0.31, 1.00)*
Young girls should be sure to eat $\geq 1$ serving of soy per day.

<table>
<thead>
<tr>
<th>Serving</th>
<th>Ingredient</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 g</td>
<td></td>
</tr>
<tr>
<td>240 ml</td>
<td></td>
</tr>
<tr>
<td>245 g</td>
<td></td>
</tr>
<tr>
<td>100 g</td>
<td></td>
</tr>
<tr>
<td>100 g</td>
<td></td>
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</table>
Depression

Commonly occurring disorder associated with diminished quality of life and increased morbidity and mortality

- Affects 350 million people
- Second leading cause of years lived with disability
- 3-7x more common in people with chronic conditions
- More common in women

Global problem
... the clinical and epidemiologic evidence suggests that isoflavones may offer a safe, well-tolerated option for management of depression.

that isoflavones may offer a safe, well-tolerated option for management of depression. Furthermore, the intervention doses used in the clinical studies fall well within the dietary range. The extant literature reveals key design features for future studies, which based upon the results of this review, are clearly warranted.


Depression is a commonly occurring disorder associated with diminished quality of life (QoL) and increased morbidity and mortality.\textsuperscript{1,2} The World Health Organization ranks depression as the fourth leading cause of disability worldwide and projects that by 2020 it will supported by the recent recommendation of the US Preventive Services Task Force to screen for depression among all adults.\textsuperscript{8}

Epidemiologic studies indicate that many depressed individuals do not seek treatment for their condition,\textsuperscript{9} and that
Low-dose isoflavone aglycone alleviates psychological symptoms of menopause in Japanese women: a randomized, double-blind, placebo-controlled study

Asuka Hirose¹ · Masakazu Terauchi² · Mihoko Akiyoshi¹ · Yoko Owa¹ · Kiyoko Kato¹ · Toshiro Kubota¹

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Abstract

Purpose Many studies have demonstrated the effectiveness of isoflavones on menopausal symptoms; however, these mostly used high dosages. Because high-dose isoflavone may result in endometrial hyperplasia, we investigated whether low-dose isoflavone aglycone alleviates menopausal symptoms similarly to high dosages.

Methods We conducted a randomized, double-blind, placebo-controlled study in 90 healthy women aged 40–60 years who had at least one menopausal symptom on the Menopausal Symptom Scale (MSS). The participants were randomized to receive active tablets containing ultralow-dose (12.5 mg/day; \(n = 30\)) or low-dose (25 mg/day; \(n = 30\)) isoflavone aglycone, or placebo.

Keywords Flavonoids · Depression · Insomnia · Mood · Sleep

Introduction
Low-dose isoflavone aglycone alleviates psychological symptoms of menopause in Japanese women: a randomized, double-blind, placebo-controlled study

Asuka Hirose¹ · Masakazu Terauchi² · Mihoko Akiyoshi¹ · Yoko Owa¹ · Kiyoko Kato¹ · Toshiro Kubota¹

• 90 healthy postmenopausal Japanese women

• 8 week intervention

• 3 groups: 1) Placebo 2) 12.5 mg/d isoflavones 3) 25 mg/d isoflavones
Effects of Soybean Isoflavonones on the Depression Score in 87 Postmenopausal Japanese Women
Effects of Soybean Isoflavones on the Depression Score in 87 Postmenopausal Japanese Women

* p<0.05  ** p<0.01  # p<0.05 vs placebo

Arch Gynecol Obstet. 293: 609, 2015
Harnessing Soy Nutrition & Health Research for Consumer Guidance

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- Misinformation
Health effects of isoflavones misrepresented

The article by Fernandez-Lopez, Lamothe, Delample, Denayrolles, and Bennetou-Pelissvero (2016) on removing isoflavones from soyfoods is based upon the literature concerning the health consequences of soyfood consumption, and more specifically the effects of soy isoflavones. This is an extremely complex field of study and over the years hundreds of articles have been written and more recent data have given way to a more accurate understanding. We are writing to point out inaccuracies in the presentation and interpretation of the literature because, as stated by the authors, these data were central to the justification of the study published in the Journal.

Food Chem 225: 289, 2017

1. Breast cancer

The authors note that: 1) the primary soybean isoflavone genistein induces the expression of genes involved in breast cancer cell proliferation in women with estrogen-dependent breast cancer (Shike et al., 2014); 2) soyfoods have proliferative effects on healthy breast cells in premenopausal women (McMichael-Phillips et al., 1998); and 3) genistein and daidzein are growth factors for human estrogen-dependent tumor cells in vitro and in animal models of xenograft nude mice (Du et al., 2012).

The paper cited as evidence of a breast cell proliferative effect in premenopausal women was actually a preliminary analysis of the data (McMichael-Phillips et al., 1998). One year later the full analysis showed no effect on proliferation (Hargreaves et al., 1999). Furthermore, although genistein did increase the expression of genes involved in cell proliferation, in the cited study there were actually no effects on cell proliferation, even though the daily amount of genistein (50 mg) that the women consumed was unusually high, equivalent to approximately five servings of traditional soyfoods (Shike et al., 2014). The lack of effect on in vivo cell

Leinster, & Cassidy, 2010; Wu et al., 2015) or, as already noted, no effect on breast cell proliferation. In addition, prospective epidemiological research involving over 11,000 women with breast cancer shows that post-diagnosis soy intake reduced breast cancer recurrence and increased survival in both Western and Chinese women (Chi et al., 2013; Nechuta et al., 2012).

2. Isoflavone intake

Two studies, one from a rural area (Liu et al., 2004) and one from an urban area, (Lee et al., 2014), are cited by the authors in support of their contention that historical Asian isoflavone intake was lower than current intake because traditional cooking practices removed most of the isoflavones (italics added).

Although urban mean isoflavone intake in the cited study was indeed about twice as high (36 mg/d vs 17.7 mg/d) as rural intake, total soyfood consumption was also about twice as high (93 vs 39 g/d). Therefore, these comparisons do not support the authors’ contention but merely show that populations from two distinct locations within China consumed different amounts of soy, which is not surprising as it is well established that dietary habits differ markedly among regions within this heterogeneous country (Zhao, Hasegawa, & Chen, 2002).

3. Hidden soy

The authors express concern about possible overexposure to isoflavones because of all the hidden soy (soy protein added to non-soy foods).

Using the United States Department of Agriculture (USDA) isoflavone database and intake data from the National Health and Nutrition Examination Survey (NHANES) III, Bai, Wang, and Ren
Feminization

Soy = Man Boobs
Clinical studies show no effects of soy protein or isoflavones on reproductive hormones in men: results of a meta-analysis

Jill M. Hamilton-Reeves, Ph.D., a Gabriela Vazquez, Ph.D., b,c Sue J. Duval, Ph.D., b William R. Phipps, M.D., d Mindy S. Kurzer, Ph.D., e and Mark J. Messina, Ph.D. f,g

a Department of Family, Consumer, and Nutrition Science, St. Catherine University, and Department of Food Science and Nutrition, University of Minnesota, St. Paul, Minnesota; b Division of Epidemiology and Community Health, University of Minnesota, Minneapolis; c Department of Neurology, University of Minnesota, Minneapolis, Minnesota; d Department of Obstetrics and Gynecology, University of Rochester Medical Center, Rochester, New York; e Department of Food Science and Nutrition, University of Minnesota, Minneapolis, Minnesota; f Department of Family, Consumer, and Nutrition Science, St. Catherine University, St. Paul, Minnesota; g Department of Food Science and Nutrition, University of Minnesota, Minneapolis, Minnesota

"No significant effects of soy protein or isoflavone intake on testosterone ... were detected."

Isolated soy protein, or isoflavone extracts (from soy or red clover) and [2] circulating T, SHBG, free T, or calculated FAI was assessed. Data were extracted by two independent reviewers. Isoflavone exposure was abstracted directly from studies.

Main Outcome Measure(s): Fifteen placebo-controlled treatment groups with baseline and ending measures were analyzed. In addition, 32 reports involving 36 treatment groups were assessed in simpler models to ascertain the results.

Result(s): No significant effects of soy protein or isoflavone intake on T, SHBG, free T, or FAI were detected regardless of statistical model.

Conclusion(s): The results of this meta-analysis suggest that neither soy foods nor isoflavone supplements alter measures of bioavailable T concentrations in men. (Fertil Steril® 2010;94:997–1007. ©2010 by American Society for Reproductive Medicine.)
... isoflavones do not exert feminizing effects on men at intake levels equal to and even considerably higher than are typical for Asian males.
Soy consumption and prostate cancer risk in men: a revisit of a meta-analysis

Lin Yan and Edward L Spitznagel  
AJCN Nutr 89: 1155, 2009

Is phytoestrogen intake associated with decreased risk of prostate cancer? A systematic review of epidemiological studies based on 17,546 cases

Andrology 4: 745, 2016

1M. Zhang, 1K. Wang, 2L. Chen, 1B. Yin and 1Y. Song
1Departments of Urology, and 2Ultrasound, Shengjing Hospital, China Medical University, Shenyang, China

Asian epidemiologic studies show soy intake is protective against prostate cancer
Can soyfoods be safely consumed by breast cancer patients?
Why the controversy?

SOY & BREAST CANCER
Estrogen and Breast Cancer
Menopausal Hormone Therapy for the Primary Prevention of Chronic Conditions: U.S. Preventive Services Task Force Recommendation Statement

Virginia A. Moyer, MD, MPH, on behalf of the U.S. Preventive Services Task Force*

Description: Update of the 2005 U.S. Preventive Services Task Force (USPSTF) recommendation statement on hormone therapy for the prevention of chronic conditions in postmenopausal women.

Methods: The USPSTF commissioned a review of the literature to update evidence about the benefits and harms of using menopausal hormone therapy to prevent chronic conditions, as well as whether the benefits and harms of hormone therapy differ by population subgroups defined by age; the presence of comorbid medical conditions; and the type, dose, and method of hormonal

"... the use of estrogen alone results in a small reduction in the risk for developing or dying of invasive breast cancer."

... the U.S. Preventive Services Task Force (USPSTF) makes recommendations about the effectiveness of specific clinical preventive services for patients without related signs or symptoms.

It bases its recommendations on the evidence of both the benefits and harms of the service and an assessment of the balance. The USPSTF does not consider the costs of providing

primary prevention of chronic medical conditions. This is not a recommendation about the use of hormone therapy to treat menopausal symptoms, such as hot flashes or vaginal dryness; the USPSTF did not review the evidence related to this possible indication because it falls outside of the mission and scope of the USPSTF. This recommendation also does not apply to women younger than 50 years who

Soyfoods are safe for breast cancer patients
Links between better survival after breast cancer and:

- Healthy body weight
- Being physically active
- Eating foods containing fiber
- Eating foods containing soy
- A lower intake of total fat, & in particular, saturated fat
Post-diagnosis Soy Food Intake and Breast Cancer Survival: A Meta-analysis of Cohort Studies

Feng Chi*, Rong Wu, Yue-Can Zeng, Rui Xing, Yang Liu, Zhao-Guo Xu

Abstract

Background and Objectives: Data on associations between soy food intake after cancer diagnosis with breast cancer survival are conflicting, so we conducted this meta-analysis for more accurate evaluation. Methods: Comprehensive searches were conducted to find cohort studies of the relationship between soy food intake after cancer diagnosis and breast cancer survival. Data were analyzed with comprehensive meta-analysis software. Results: Fifteen cohort studies (11,286 patients) were included. Results: All patients with soy richest intake vs. lowest: HR 0.75, 95% CI 0.64 0.88) and ER positive patients (highest vs. lowest: HR 0.72, 95% CI 0.61 0.84), and both premenopausal (highest vs. lowest: HR 0.78, 95% CI 0.69 0.88) and postmenopausal patients (highest vs. lowest: HR 0.81, 95% CI 0.73 0.91). In addition, soy food intake was associated with reduced recurrence in ER negative (highest vs. lowest: HR 0.64, 95% CI 0.44 0.94) and ER+/PR+ (highest vs. lowest: HR 0.65, 95% CI 0.49 0.86), and postmenopausal patients (highest vs. lowest: HR 0.67, 95% CI 0.56 0.80). Conclusion: Our meta-analysis showed that soy food intake might be associated with better survival, especially for ER negative, ER+/PR+, and postmenopausal patients.

Keywords: Soy foods - breast neoplasms - survival - meta-analysis - receptor status - postmenopausal

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Post-diagnosis Soy Food Intake and Breast Cancer Survival: A Meta-analysis of Cohort Studies

**Exp. Details**
- 5 studies (3 Chinese, 2 American)
- 11,224 women with breast cancer
- Follow up: 3.9 to 7.3 years
- 948 breast cancer deaths
- 1449 recurrences

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Hazard ratio</th>
<th>95% CI</th>
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<tbody>
<tr>
<td>Mortality</td>
<td>0.84</td>
<td>0.71, 0.99</td>
</tr>
<tr>
<td>Recurrence</td>
<td>0.74</td>
<td>0.64, 0.85</td>
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Gout: The Disease of Kings

Prevalence: 1-2% of the population

Incidence higher in Asia

Elevated serum uric acid levels
Soyfoods, hyperuricemia and gout: A review of the epidemiologic and clinical data

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“... there is no reason for individuals with gout or at risk of developing gout to avoid soyfoods.”

toward soyfoods. Among the healthcare professionals who responded to the survey, 95\% considered soyfoods to be somewhat or very healthy and nutritious. In contrast, 48\% expressed the view that soyfoods are likely to cause gout. However, none of the six epidemiologic studies identified provided any evidence that soy intake was associated with circulating uric acid levels, hyperuricemia or gout. Data from the five human intervention studies evaluated indicate soy protein does elevate serum uric levels, but in response to amounts comparable to Asian intake, the expected rise would almost certainly be clinically irrelevant. Although there is a need for long-term research, on the basis of the existing data there is no reason for individuals with gout or at risk of developing gout to avoid soyfoods.

Key Words: soy, vegetarian, gout, hyperuricemia, uric acid

Asia Pacific J Clinical Nutr 20: 347, 2011
Can soy intake affect serum uric acid level? Pooled analysis from two 6-month randomized controlled trials among Chinese postmenopausal women with prediabetes or prehypertension

Z. M. Liu · C. S. Ho · Y. M. Chen · J. Woo

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Abstract

Purpose Hyperuricemia is a recognized risk factor for cardiovascular diseases. Soy foods contain a moderate amount of purine and may predispose to raised serum uric acid (UA). However, no study has examined the long-term effect of soy intake on UA levels. We examined whether consumption of soy foods and isoflavone extracts for 6 months altered serum UA.

Methods The analysis included two randomized controlled trials (soy protein trial and whole soy trial) among total 450 postmenopausal women with either prehypertension or prediabetes. We conducted a pooled analysis by combining participants from both the soy flour and soy protein groups (combined soy foods group), participants from both the isoflavone and daidzein groups (combined isoflavone group) and participants from both milk placebo

Results In the pooled data, 417 subjects completed the study according to protocol. The baseline serum UA levels were comparable among the three combined groups. There was a lower decrease in UA levels among women in the combined soy foods group compared with women in the other two groups (p = 0.028 and 0.026). The net decrease and % decrease in UA were 14.5 μmol/L (95 % CI 1.93–25.6, p = 0.023) or 4.9 % (95 % CI 1.3–8.5 %, p = 0.023) between the combined soy foods group and placebo group.

Conclusions Among Chinese postmenopausal women with either prehypertension or prediabetes, soy intake did not increase urate levels.

Keywords Soy foods · Isoflavones · Uric acid

Effects of Adding Soy Protein (15 g/d) to the Diet on Serum Uric Acid Levels in Postmenopausal Women

Group

Control (n=150)  Soyfoods (n=150)

Baseline  6 months

Daily Soyfood Intake Recommendations

- 1 serving (Children)
- 2 servings (Adults, general)
- 3-4 servings (↓ blood pressure/cholesterol)
- 3 servings (PostM women, arterial health)
- 2 servings (Men, prostate cancer)

Servings: 240 ml milk, 85-100 g tofu
Thank you for your attention

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