



The key findings on soy and health presented at the Fifth International Symposium on the 'Role of Soy in Preventing and Treating Chronic Disease', held from September 21-23, 2003 are summarised by Dr Mark Messina, Chairman, Editorial Advisory Board of "The Soy Connection".

1. Prostate Cancer

FINDING: Daidzein and equol (a bacterially derived metabolite of daidzein) levels in the prostate of men after consuming soyfoods were found to be approximately 6 and 13 fold higher than serum levels whereas genistein levels were approximately 50 percent lower.

These findings indicate that serum levels don't necessarily reflect tissue levels, and that in the case of two of the major isoflavones, levels in the prostate are actually much higher. Interestingly, previous animal work demonstrated that genistein exerted anticancer effects on prostate tissue at levels that were much lower than what was anticipated to be necessary based on the in vitro data.⁽¹⁾ Collectively, these findings emphasize the need for doing human research before making definitive conclusions.

2. Cholesterol Reduction

FINDING: A "non-denatured" isolated soy protein was found to decrease LDL-cholesterol levels to an approximately two fold greater extent than a commercially available isolate.

These results should be considered quite preliminary but they clearly have potentially important implications. Certainly, they offer a potential explanation for the substantial variation in response to the cholesterol lowering effects of soy protein observed among studies.

3. Hot Flashes

FINDING: Preliminary results from a meta-analysis indicate soy and isoflavones exert modest beneficial effects on hot flashes but primarily only in women with very frequent hot flashes.

These results are consistent with a recently published review which found that soy and isoflavone supplements decreased the frequency

of hot flashes by approximately 5 percent above the placebo response for each hot flash a woman has above 5/day.⁽²⁾ In theory, a woman who has 8 hot flashes per day would experience a 15 percent reduction in frequency above the placebo response which is typically about 25 percent. Thus, the total response would be a 40 percent reduction; hot flashes would decrease from 8/day to about 4-5/day.

The authors of this published analysis concluded that the evidence is sufficiently suggestive to recommend that women try soy and isoflavone supplements for alleviation of hot flashes but not sufficiently strong to definitely conclude that soy is efficacious. The authors felt the possible coronary and skeletal benefits of soy in combination with the placebo effect that would result by virtue of women using soy for relief of hot flashes provided additional justification for recommending soy despite the tentative data.

4. Soy Allergy

FINDING: Only one out of 3,000 adults is estimated to be allergic to soy protein.

This estimate is much lower than is commonly perceived. However, the incidence of true food allergy among adults is quite low and soy is much less allergenic than many commonly consumed foods, thus this low estimate appears reasonable. Also, the reaction to soy protein is typically less severe than is the case for many other foods.

5. Breast Cancer

FINDING: Isoflavone-rich isolated soy protein inhibited the proliferative effect of estrogen on breast tissue in ovariectomized monkeys and reduced breast tissue inflammation in women.

However, overall, it is not clear from the existing literature that soy exerts antiestrogenic effects on breast tissue in women and a recent study failed to conclusively show that soy inhibits the hyperplastic effects of estrogen on the endometrial tissue.⁽³⁾

10 Specific Findings on Soy and Human Health

by Dr Mark Messina, Ph.D
Chairman,
Editorial Advisory Board
"The Soy Connection"

6. Calcium Excretion

FINDING: Soy protein did not decrease urinary calcium excretion in comparison to meat protein in postmenopausal women.

The metabolism of the sulfur amino acids in protein leads to the production of acid which in turn causes bone resorption so that the buffering agents in the skeletal system can be utilized to maintain pH within the appropriate range.

However, the relationship between protein intake and bone health is complex and recent work suggests higher protein diets may reduce the risk of osteoporosis. Nevertheless, several human studies conducted over the past 15 years demonstrated that soy protein decreases calcium excretion in comparison to animal protein.^(4, 5) This is not surprising since soy protein is lower in sulfur amino acids than animal protein.

Thus, these new findings presented at the symposium contrast with the existing literature. However, this study was well designed and therefore the results should not be discounted. Worth noting, is that in the meat-soy study the calcium content of the diets was only about 700 mg whereas in a recent study showing markedly lower urinary calcium in response to soy protein compared to a casein-whey mixture calcium intake was about 1500 mg.⁽⁶⁾

Perhaps, the low calcium intake in the soy-meat study prevented the hypocalciuric effect of soy protein observed in other studies from having an impact on calcium excretion. Of course, this must be demonstrated experimentally. Obviously, more research is needed to clarify the relationship among various proteins and calcium excretion.

7. Eye Health

FINDING: The isoflavone genistein protected against xray induced cataract formation in rats.

This is a new area of research. Genistein was found to be present in the crystalline lens and was effective against x-rays whether given in the form of soy protein or as a supplement. The antioxidant effects of genistein may have been responsible for protection against cataract formation.

8. Isoflavone Content

FINDING: Isoflavone content should be expressed as the aglycone weight.

Isoflavones naturally occur in the soybean in the form of glycosides – a glucose attached to the isoflavone molecule. The weight of the sugar is approximately 40 percent of the total weight of the isoflavone glycoside. Of course, the sugar is biologically irrelevant.

The situation with isoflavones is analogous to calcium salts such as calcium carbonate. A 500 mg tablet of calcium carbonate provides only 200 mg of elemental calcium. A 100 mg isoflavone tablet containing isoflavones in the glycoside form provides only 60 mg of biologically active isoflavones.

Unfortunately, information about the isoflavone content of products usually does not indicate whether the isoflavone amount refers to the aglycone weight or glycoside weight. To avoid confusion, the recommendation is for all isoflavone amounts to refer to the aglycone weight.

9. Weight Loss

FINDING: Data suggesting soy protein specifically aids in weight loss is very limited but the health advantages of soy protein make it a good choice for high protein diets.

Since soy protein modestly lowers serum cholesterol and perhaps blood pressure, and favorably affects renal function compared to animal proteins, soyfoods are good options for increasing protein intake.

10. Soy Protein and Renal Function

FINDING: In comparison to casein, soy protein improved the nutritional status of chronic renal dialysis patients.

The principal investigator of this three-week study suggested that the improvement was due to soy protein having an antiinflammatory effect. These results are generally consistent with previously published research showing that soy protein favorably affects renal function in both healthy adults and diabetic patients, including a new seven-week study that compared the effects of consuming a low protein diet with or without soy protein on renal function in diabetic subjects with normal renal function.⁽⁷⁾

References

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