



SOY ISOFLAVONES

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SOY ISOFLAVONES: NOVEL ADJUNCT IN TREATMENT

BY CARL GERMANO, M.A., RD., CNS

Last year, the National Cancer Institute (NCI) sponsored a major international symposium on phytoestrogens (isoflavones) in foods and how they can prevent cancer. Interestingly, most of the conference participants focused on the beneficial effects of soybeans and soybean isoflavones. While the concept that certain foods can prevent disease is not new, it seems that the soy isoflavones are presently attracting a great deal of interest in clinical research directed at cancer and cardiovascular disease prevention.

It is interesting to note that Americans do not consume many soy-based products, yet the U.S. is the world leader in soybean production. Comparatively, in countries where soy is a main staple of the diet, rates of heart disease and various forms of cancers are typically lower.¹

While soy is not the only plant source of phytoestrogens, it is one of the richest sources and the only source of the most studied isoflavone called genistein. More importantly, an extensive amount of research exists to demonstrate that specific forms of isoflavones found in soy, genistein and daidzein, help regulate hormonal balance in women, may prevent osteoporosis and have potent antioxidant, anti-cancer and cholesterol-lowering properties.²⁻⁶

What Are Isoflavones?

Isoflavones are...natural plant phytoestrogens which have been shown to have anticancer proliferation, differentiation and chemoprotective effects.^{7,9} Soyfoods possess a variety of beneficial constituents and unique properties that protect against cancer and heart

disease. It has been shown that populations regularly consuming soybeans have reduced rates of breast, colon and prostate cancer.¹⁰⁻¹² One of the most distinctive features of soy is its exceptionally high content of the isoflavones/phytoestrogens genistein and daidzein.



Chemically, isoflavones look very similar to the female sex hormone estrogen. These isoflavones are converted to form very weak estrogen but are only one thousandth as potent.¹³ Although they are very weak as compared to steroid hormones produced in the body, they are very powerful in their effects.

It is known that high levels of estrogen are linked to increased risk of breast cancer as well as other hormone dependent cancers. Cancers of the breast, prostate, uterine and colon have been shown to have estrogen receptors. It is believed that estrogen may promote several types of cancer by binding to a receptor site on the cell and stimulating it to grow abnormally.

Laboratory studies have shown that when cells are exposed to estrogen, the normal orderly growth is disrupted. Therefore, estrogen does not necessarily cause cancer but is implicated in promoting cancer by increasing the cells to grow.

Because isoflavones look like estrogen, they compete for receptor sites normally occupied by estrogen. Since isoflavones have very weak estrogen activity, they do not produce much of an effect as described above. Therefore, estrogen/hormone dependent tu-

mors will not be capable of flourishing if isoflavones attach to their receptor sites in place of estrogen.¹⁴

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Other studies have also shown that a woman's menstrual cycle was lengthened by the incorporation of soy in their diets. One particular study demonstrated that when premenopausal women consumed soy isoflavones as part of their experimental diet, the menstrual cycle increased by an average of 2.5 days.¹⁵ Longer menstrual cycles are associated with a decreased risk of breast cancer. Since the menstrual cycle is under the influence of estrogen, the findings concluded that soy isofla-



vones actually act as anti-estrogens. It has been suggested that high levels of genistein can act as weak estrogen without the deleterious effect of promoting estrogen-dependent tumors.¹⁶

While the antiestrogenic effects of soy isoflavones have a profound effect on breast cancer, the most exciting research on isoflavones reveals that they are effective against a wide variety of cancers. Specifically, the isoflavone genistein, which has over 200 papers published on its importance as an anti-cancer agent, appears to act in the following ways:

- ◆ Inhibits the growth of cancer cells in most cancers including breast, colon, lung, prostate, skin and leukemia.
- ◆ Is a potent inhibitor of the enzyme tyrosine protein kinase, which is responsible for stimulating the growth of cancer cells.¹⁷
- ◆ Causes cancer cells to differentiate, making them capable of going from cancer cell to normal cell.
- ◆ Inhibits angiogenesis, which is required for the growth of new blood vessels to feed a tumor.¹⁸
- ◆ Is an excellent antioxidant.¹⁹



While soy isoflavones have been studied quite extensively for cancer prevention, other studies have demonstrated that the saponins, phytosterols and isoflavones in soy have significant protective effects on the cardiovascular system.²⁰ The various theories about soy's role in protecting the cardiovascular system, are based upon the effect isoflavones and phytoestrogens have on cholesterol and lipoprotein particles (especially the damaging low density type called LDL).²¹⁻²²

Soy constituents; especially genistein, can effect atherosclerosis (fatty buildup in arteries) by:

- ◆ Inhibiting oxidation of LDL cholesterol by acting as a powerful antioxidant.
- ◆ Affecting the composition of LDL's so that they are less available to stick to the artery wall.
- ◆ May prevent the growth of cells that form plaque.
- ◆ May inhibit thrombus formation and decrease platelet aggregation.
- ◆ Improves vasodilation in atherosclerotic arteries.

Additionally, other soy constituents are believed to help lower cholesterol by either blocking its absorption or causing more cholesterol to be excreted.²³ While the mechanism has not been elucidated, isoflavones have been clinically shown to decrease cholesterol levels by as much as 35% when

added to the diet.

There already exists a long list of phytochemicals that exert a profound beneficial effect on the body — much more than any vitamin or mineral will ever have. From fighting bacteria to combating cancer, phyto-chemicals are likely to become a household name and the driving force of the health food industry.

It is apparent that the isoflavones found in soy, especially genistein and daidzein, are two of the most important phytochemicals to come to our market. While incorporation of more soy foods into the diet should be a goal, therapeutic use of isoflavones as an adjunct in cancer and cardiovascular care can now be achieved via supplementation. VR.

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