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Breast Cancer Prevention
Part 2: Vegetables and Fruits

By Ann Gerhardt, MD *May 2011*

Breast cancer afflicts more women in Westernized than non-Westernized societies. Southern European countries, just as Westernized as the U.S., are the exception to the rule. Could the difference be the sun, siestas or diet? What are Americans doing wrong, other than being more obese, using more estrogen, and not dying off from something else first?

Part 1 of this series dealt with sleep. Parts 3 and 4 of this series will deal with weight, toxins, alcohol and dietary fat. This article addresses vegetables and fruits as potential cancer fighters. It sounds like a no-brainer: **For years public health officials have touted eating fruits and vegetables for cancer prevention. Unfortunately, it's not that simple and most of the research attempting to sort it out has inherent flaws.**

Three study types look at diet's effect on cancer - epidemiological, dietary recall (of those with and without cancer), and prospective trials (watching what happens to people over time). Epidemiological research compares cancer rates between populations with different dietary patterns. This type suffers from too many confounding factors, like exercise, carcinogen exposure and psychosocial influences.

Dietary recall studies ask people with and without cancer to recall their past dietary intake, but selective recall and florid inaccuracy invalidate the data. Many people are oblivious to what they really eat. **How many of you can remember what you ate last Tuesday, let alone 4 years ago? If you do, are you willing to admit it to a dietitian?** Will you subconsciously skew your report to foods you know you should be eating?

Prospective studies are tough, because cancer studies take a long time. Carcinogen exposure today might not lead to cancer for ten or twenty years. People change their dietary habits over time or are lost to follow-up.

Given the vagaries of diet-cancer research, we end up going with the preponderance of evidence or the largest prospective trials. The **World Cancer Research Fund evaluated articles published before 1996 and concluded that 8 of 11 reasonably good studies showed a protective effect of vegetables against breast cancer.** The same was true for only 4 of 12 studies of fruits.

That might resolve the issue - Vegetables protect, fruits don't, except for **recent analyses of pooled studies which conclude that neither protect.** They assert that total vegetable and fruit consumption during adulthood is not significantly associated with reduced breast cancer risk. They even conclude that specific botanical groups, like berries or cruciferous vegetables, confer no protection. These scientists think they have the last word, but the studies generally didn't last longer than ten years and it's hard to get good data concerning consistent intake over years. The true benefit of a specific food for subgroups of people can get statistically lost when mushed in with the masses.

The simple distinction of vegetarians vs. omnivores doesn't solve the issue either. **Vegetarians have no less breast cancer than omnivores,** but a lot of vegetarians don't eat many vegetables and many omnivores balance their meat with lots of vegetables. The most studied vegetarian group, Seventh Day Adventists, have no fewer breast cancers, but have less aggressive breast cancer and a lower cancer death rate.

While the "lumpers" of nutritional research have decreed that total fruit and vegetable intake doesn't prevent breast cancer in all people**, the "splitters" find that some plant foods work for some people.** African-American women who eat a lot of vegetables get less hormone receptor negative (ER-/PR-) cancer. Turnips and Chinese cabbage reduce breast cancer risk in Shanghai women. In a large group of Polish women, those eating more fruit had less cancer, particularly estrogen receptor positive (ER+) cancer.

Scientists often single out cruciferous (also called Brassica) vegetables such as broccoli, kale, mustard and collard greens, bok choy, cauliflower, cabbage, rutabaga, turnip, radish, watercress, wasabi and Brussels sprouts

for their cancer preventive potential. We ingest carcinogens, substances that induce cancer, every day and the body usually detoxifies these into harmless by-products. **Cruciferous vegetables contain healthy, natural chemicals that help the body's detoxification efforts.** Women with genetically defective detoxification enzymes have an increased cancer risk that can be at least partially overridden by cruciferous vegetables.

Cruciferous vegetables also affect hormone metabolism in post-menopausal women, changing urinary hormone by-products to a pattern rarely associated with breast cancer. **In some groups of women, eating one to two servings of cruciferous vegetables daily reduces breast cancer risk by as much as 25%.**

Heavy drinkers (more than an average of one ounce of alcohol per day) benefitted most from fruit and vegetable-rich diets in a large 12-country European study. This study used dietary recall to assess incremental cancer risk with each half-cup increase in daily vegetable consumption. Pretty much everyone got breast cancer at the same rate, except for the drinkers and Swedish women, who got less, and Spanish women, who got more cancer with increasing dietary vegetables and fruits. Go figure. Attempts to tease out possible associations based on menopausal status, weight and types of foods were fruitless.

The Nurse's Health Study mined a huge amount of dietary and disease data to look for correlations. Women with the highest intake of vegetables, particularly yellow and orange vegetables, compared to those with the lowest, had a reduced risk of estrogen receptor-negative (ER-) breast cancer.

What about individual vitamins? Vitamins A, C or E given in food or supplements do not affect breast cancer risk. Vitamin A slows mammary cell growth and inhibits chemical carcinogenesis in breast tissue, so theoretically it should prevent breast cancer. In the Nurse's Health Study, **only women with marginal or grossly deficient vitamin A levels benefitted from supplements.**

In test tube experiments, bioflavonoids from grapefruit block growth of non-estrogen-receptor positive cells. Soy bioflavonoids slow growth of cells with estrogen receptors. Breast cancers from tumorigenic chemicals in rats fed grape juice grow more slowly than in those drinking water. These foods should prevent cancer risk, but it's very hard to do good studies for every individual food and food combination, asking people keep their diet and lifestyle constant over the long time period necessary for cancer research.

Most Chinese studies find that fruits and vegetables protect against breast cancer, in contrast to findings in Americans. Chinese women with the greatest fruit and vegetable intake have only one-quarter the cancer risk of those eating very few. The specific type doesn't make a difference - dark green leafy, cruciferous, carrot/tomato/banana and watermelon/papaya/cantaloupe groups have been equally protective.

Of almost 9000 Italian women, those eating a diet high in raw vegetables were protected against a particularly aggressive breast cancer type (HER-2 positive). The salad vegetables even worked better than diets with a lot of cooked vegetables or pasta sauce.

There may be foods that negate vegetables' benefit. In a Korean study comparing women with and without breast cancer, those with cancer ate fewer vegetables, and a higher percentage of the vegetables they did eat were pickled. Red meat is definitely associated with breast cancer, probably more from its nitrate content than the fat or protein. Chinese women eating soy protein with their vegetables had less breast cancer than those whose protein source was meat.

Nutrient interaction raises an even thornier question. **What if it's not just one miracle food that will rid you of cancer?** What if preventing breast cancer requires BOTH vegetable/fruit nutrients AND a particular fat balance from other foods? Or the absence of nitrates and other carcinogens? Most dietary studies do fancy statistical machinations to separate the risk attributable to vegetables and fruits from the estimated risk from other factors. If preventing cancer requires two components, factoring out one makes the results look negative.

Once a cancer starts, can diet stop it? Maybe, maybe not. Early-stage breast cancer recurs at the same rate in women consuming various amounts of vegetables and fruits. Unless they take tamoxifen. **Women on tamoxifen almost halve their recurrence rate if they eat a large amount of vegetables, each day, including cruciferous vegetables.**

My Opinion: I believe that there are too many caveats to dietary research to rule out a protective effect of vegetables and fruits against breast cancer. I figure that eating five or more vegetables and fruits daily has more chance to prevent breast cancer than do five bags of chips. Vegetables seem to be more effective in cancer prevention than fruits, so they, particularly the cruciferous type, should far out-number fruit servings each day. If you are a vegetable-hater willing to gamble on a short life, have at it. If not, who wants their death to be the data-point that cinches the association?