The Health Nugget

Food Synergy

It was a strange turn of events that left researchers wondering. Proponents of the therapeutic value of food were sure that this study would be an arrow in their quiver. But it wasn't. Instead the Alpha-Tocopherol, Beta-Carotene Cancer Prevention Study indicated that lung cancer actually increased in those who took beta-carotene supplements.

The Women's Health Study was another attempt at understanding the potential medicinal value of food components on diseases such as heart disease and cancer. Again, the surprise came as it was reported that those who supplemented with 400 IU or more of vitamin E a day might actually increase the risk of heart failure. "According to a pooled statistical analysis of 19 studies, people taking 400 IU or more a day had about a 5 percent higher death rate than those who didn't take that much vitamin E. The researchers noted that the higher the dose the greater the risk."[1] What went wrong?

Beta-carotene is one of the carotenoids, a class of pigments in fruits and vegetables. The liver converts beta-carotene to chemicals we have labeled retinoids, or vitamin A. This vitamin is known to influence over 500 genes. We know it best for maintaining healthy vision, but only one-thousandth of the body's vitamin A is in the eye. Much more of it is involved in the production of proteins and cell differentiation. Cell differentiation is a process by which each type of cell develops to perform a specific function. Vitamin A's role here is esteemed for its ability in preventing cancer.

The American Cancer Society sheds some interesting light on the "what happened to beta-carotene/vitamin A?" story. "Several studies based on dietary surveys of large numbers of people have concluded that eating foods rich in vitamin A is linked to a lower risk of certain types of cancer. But it is not clear whether the protective effect was due to vitamin A or to other helpful substances in these foods…. Some animal studies have found that vitamin A and other retinoids may enhance the immune system, slow tumor growth, shrink tumors, and make some cancer treatments work better. Some laboratory, animal, and human studies have found that certain retinoids may also inhibit cancer development…

"Studies of vitamin A's possible role in cancer prevention have been generally disappointing…. There have been no consistent findings showing a lower risk of cancers of the stomach, intestines, skin, breast, cervix, bladder, or prostate due to vitamin A in the diet.

"The use of vitamin A supplements has also not been proven to reduce cancer risk in humans. It appears that the combination of micronutrients in fruits, vegetables, legumes, and grains is more likely to be helpful than individual vitamins."[2]

In other words, it's most likely that beta-carotene, as found mixed with all the other components and phytochemicals in food, is what makes it something special and can potentially fuel its anti-cancer activity. We want to isolate the component that will cure us, make us feel better and keep us young so we can concentrate it and swallow it with one gulp. At times this is very advantageous. I pop pills when I am getting sick and they work. But, how often on a day to day basis do we reap less benefit as a result of a lack of synergy?

The idea of nutrient synergy is challenging as much of this kind of research is based on what specific chemicals trigger a reaction in the human body that can be replicated with similar results. This is how we develop scientific conclusions and documentation on which to base viable remedies

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by Risë Rafferty

and prescriptions. We have learned so much about specific nutrients, from vitamin C to calcium, to odd sounding elements like quercetin and zeaxanthin. But, combinations of micronutrients? How do you verify that?

According to a Dietetic Association article, "Epidemiological studies have consistently shown that regular consumption of fruits and vegetables is strongly associated with reduced risk of developing chronic diseases, such as cancer and cardiovascular disease. It is now widely believed that the actions of the antioxidant nutrients alone do not explain the observed health benefits of diets rich in fruits and vegetables, because taken alone, the individual antioxidants studied in clinical trials do not appear to have consistent preventive effects. Work performed by our group and others has shown that fruits and vegetable phytochemical extracts exhibit strong antioxidant and antiproliferative activities and that the major part of total antioxidant activity is from the combination of phytochemicals. We proposed that the additive and synergistic effects of phytochemicals in fruits and vegetables are responsible for these potent antioxidant and anticancer activities and that the benefit of a diet rich in fruits and vegetables is attributed to the complex mixture of phytochemicals present in whole foods."[3]

Here again we are seeing that rather than an isolated substance in food being the answer, it is the "additive and synergistic effects" of the combination of nutrients as found in foods that are so powerful. Additive refers to something being added to something else to improve it. Synergy occurs when two or more entities working together bring about a result that is much greater than the sum of their individual effects or capabilities. United, the combination produces results not independently obtainable. This explains why no single antioxidant, or vitamin, or mineral, or phytochemical, can replace the combination of good food.

Beyond the synergy found within a single food, food synergy exists even in combining certain foods. A University of Illinois food science and human nutrition professor, John Erdman, witnessed such food synergy. Erdman and his team implanted prostate cancer cells into rats. He then divided them into groups that were fed almost the same. The diet of one group of rats was supplemented with tomato powder. The second group received broccoli powder. The third group dined on both tomato and broccoli powders. Another group was given just the isolated substances known to fight cancer that are found in broccoli and tomatoes. Yet another group received a drug that is given to men with enlarged prostates. The last group was castrated. Gulp.

Twenty-two weeks later the prostate tumors were weighed. "The tomato/broccoli combo outperformed all other diets in shrinking prostate tumors. Biopsies of tumors were evaluated at the Ohio State University confirming that tumor cells in the tomato/broccoli-fed rats were not proliferating as rapidly. The only treatment that approached the tomato/broccoli diet's level of effectiveness was castration, said Erdman."[4]

As with food, God's intention is for His people to come together and experience synergy, one making up for another's weakness, a few combining their efforts with exponential results. Belonging to this family and experiencing synergy is for everyone: for the fatherless, the widow, the homeless and the sinner. In the context of community, we experience the healing and wholeness that comes from Christ in a manner that can be experienced in no other way.

[1] Elaine Magee, MPH, RD, *Food Synergy*, p. 45.

[2] "Vitamin A and Beta Carotene," *The American Cancer Society*, (Feb. 21, 2010), http://www.cancer.org/Treatment/TreatmentsandSideEffects/ComplementaryandAlternativeMedicine/HerbsVitaminsandMinerals/vitamin-a-and-beta-carotene.

[3] Rui Hai Liu, "Potential Synergy of Phytochemicals in Cancer Prevention: Mechanism of Action," *The Journal of Nutrition*, (Dec. 1, 2004), http://jn.nutrition.org/content/134/12/3479S.

[4] Phyllis Picklesimer, "Tomato-broccoli together shown to be effective against prostate cancer," *Inside Illinois*, (Feb. 1, 2007), http://news.illinois.edu/ii/07/0201/erdman.html.

Light Bearers
37457 Jasper Lowell Rd • Jasper, OR 97438
ph (541)988-3333 • *fax* (541)988-3300
www.lightbearers.org • *email* rise@lightbearers.org