

Phytonutrient Supplements: Facts, Fictions, and Foolishness

In the recent edition of a popular men's health magazine a PhD nutritionist was asked, "Do people need supplements?" The familiar reply was, "not if they eat a balanced diet and are in good health." Most of us could add several other qualifiers, but instead let's take the doctor's response as is.

The Facts

The USDA in its January 2005 Dietary guidelines now recommends a wide variety of 7 servings of fruits and vegetables daily for "average" women and 9 a day for "average" man. Recommendations go as high as 13 servings as calorie requirements increase for those larger and more active than average.¹ The National Cancer Society admits that the "5-a-day" gospel was just the bare minimum.² Nonetheless, it is routinely reported that only 1 in 5 adults follow this advice and even less children do. (Some reports say 2 in 5 adults attain the minimum, but that was before the potato was moved from a vegetable to a grain so French fries are no longer counted!)³

The evidence gathered from 1994-2004 from the Continuing Survey of Food Intakes by Individuals concludes, "A significant gap in the *variety* of fruit and vegetable intake was also found, which does not allow for an optimal *or even near-optimal intake of antioxidant (and other) nutrients needed to protect against... 'killer' diseases.*"⁴

Yet four out of the five leading causes of death are related in part to inadequate fruit and vegetable intake:⁵

Death in the U.S. - 2001

Heart Disease	699,697
Cancer	553,251
Stroke	163,601
Obstructive Pulmonary Disease	123,974
Accidents	97,707
Diabetes	71,252

As to the new 2005 USDA guidelines, it has recently been reported that only 3 % of males report consuming the now recommended 9 servings of fruits and vegetables a day. In fact, men on average eat only 4 servings a day. Yet only 25 % of men believe they need to eat more!⁶ The Products for Better Health "State of the Plate Report" found, "No other food commodity (fruits and vegetables) – especially one with such importance to disease prevention - has a *gap this large between recommended and actual intake.*"⁷

According to recent excerpts from US Government press releases, *only 3% of the US population follow just four out of five of the recommendations of the new food pyramid guidelines!* No wonder that even the AMA recommended recently that everyone take a multivitamin!⁸

So what is it in fruits and vegetables that so promotes lifelong wellness? “The vitamins, minerals, fiber and, especially, *the phytochemicals* in fruits and vegetables appear to reduce the risk for...diseases.”⁹

Surely the natural vitamins, minerals, and fiber of fruits and vegetables are of great value. Nonetheless, conflicting evidence has been found for the association of the use of vitamin and mineral supplements for the prevention of cancer and heart disease.¹⁰

But the evidence for phytonutrient / phytochemicals keeps growing.

"... diets rich in phytochemicals provide protection from vascular diseases and many cancers (thru) direct antioxidant activity as well as modulation of enzyme expression or hormone activity...the total dietary load of phytochemicals may have important implications for health." *McCarty MF., Proposal for a dietary "phytochemical index"., Med Hypotheses. 2004;63(5):813-7.*

"When phytochemicals are added to the diet, the capacity of human genes to protect and restore optimal health is far greater than previously recognized." -*McDaniel M.D., McAnalley, Ph.D., Journal of the National Academy for Child Development: The Role of Phytochemicals in Optimal Health, 1997 Vol. 11, No. 1*

"Knowledge of the role of physiologically active food components, from both phytochemicals and zoochemicals, has ...evolved as...science has advanced beyond the treatment of deficiency syndromes to reduction of disease risk..." *American Dietetic Association on Functional Foods*

"The Dietary Approaches to Stop Hypertension (DASH) diet substantially lowers blood pressure and reduces blood lipid levels. ...the health benefits... are partially attributable to the phytochemicals..." -*Most M. M., Estimated phytochemical content of the dietary approaches to stop hypertension (DASH) diet is higher than in the Control Study Diet, J Am Diet Assoc. 2004 Nov;104(11):1725-7.*

"...In vitro and in vivo studies have demonstrated convincingly that dietary supplementation of phytochemicals has beneficial effects against certain types of pathogenesis, disease, cancer, and aging"- *Ji LL, Peterson DM., Aging, exercise, and phytochemicals: promises and pitfalls. Ann N Y Acad Sci. 2004 Jun;1019:453-61.*

Therefore if I were to be asked, “Do people need to take phytonutrient supplements” my answer might be, “No, not if they follow the USDA guidelines, live a healthy lifestyle, in a clean and supportive environment, and are in otherwise good health.” How many patients like this do you have? Of course if you can get your patients to eat their fruits and vegetables, my hats off to you! But for most clinicians a phytonutrient supplement of some kind may be the only viable alternative, though admittedly second best.

Some basic things to look for in a phytonutrient supplement include:

1) a wide variety from fruits and vegetables of all the colors,

"...fruits and vegetable phytochemical extracts ...from the combination of phytochemicals...the additive and synergistic... "complex mixture" of

phytochemicals...are responsible for these the benefits...no single antioxidant can replace the combination of natural phytochemicals..."-Lui RH, *J Nutr. Potential synergy of phytochemicals in cancer prevention: mechanism of action. Department of Food Science, Cornell University, Ithaca, NY 148532004 Dec;134(12):3479S-85S.*

2) the preferred source should not just be a pill with a grab bag of isolated phytonutrients, but include whole food and juice powders,

"...phytochemicals often appear in nature as families of related compounds (that)...may behave synergistically... and... activate metabolic enzymes...as a network"- Heber D., *Phytochemicals beyond antioxidation, J Nutr. 2004 Nov;134(11):3175S-3176S.*

3) they should have some measure of potency, the best of which presently is antioxidant capacity,

"...people may be able to reduce risk of diseases of aging--including senility--simply by adding high-ORAC foods to their diets," Floyd P. Horn, administrator, Agricultural Research Service's Human Nutrition Research Center on Aging at Tufts University in Boston.

Fictions

It must be emphasized that phytonutrient supplements are just that, phytonutrient formulas. They do not provide anywhere near the amounts of fiber, vitamins, minerals, sugars or water of the whole fruit. And no matter how careful the processing, there is always something lost in processing. So when you read a label, ad or claim that "one scoop is equal to six servings of fruits and vegetables", you know that the company proclaiming such is probably either ignorant or dishonest. Indeed, companies making similar proclamations as the one above have listed on the label that the product has 4% of the RDI of Vitamin C. Now what six fruits and vegetables provide only 4% of the RDI vitamin C? What I presume they mean to report is that their phytonutrient has the phytonutrient based antioxidant power of six servings of fruits and vegetables, or about 3000 ORAC.

Foolishness

"You can fool some of the people some of the time, but you can't fool all the people all the time"

When I first wrote about oxygen radical absorbance capacity testing (ORAC) in the April 21, 2003 issue of Dynamic Chiropractic, antioxidant capacity testing for phytonutrients was uncommon. Now we see it more and more, which is a good thing. However, I think some further familiarity with ORAC's strengths, weaknesses, and abuses is in order.

First of all ORAC is not a be all and end all. Raisins will have a higher ORAC than broccoli, but that does not mean that raisins are "better" for you than broccoli. Raisins are rich in polyphenols, great for the heart, whereas broccoli is rich in organo-sulphurs, good for detoxifying bad estrogens. One can "spike" the ORAC of a product by adding lots of "red" berries and green tea, while providing trivial amounts of terpenes like the various

carotenoids in tomatoes, and organo-sulphurs like in broccoli, Brussels sprouts, and cauliflower. One wants a balanced spectrum of phytonutrients of all the colors. Imbalanced phytonutrient supplements will tend to have a high water soluble (hydrophilic) ORAC rating but a low lipid soluble (lipophilic) ORAC rating.

Secondly, ORAC values will vary from batch to batch, even from test to test of the same batch. Companies that print one constant ORAC value on their labels from batch to batch do not seem to be aware of this fact. It would be more accurate to guarantee a minimum ORAC at time of production. The company should be able to produce an *independent* ORAC or other antioxidant capacity test from a very *recent batch* from an *unopened sealed container*.

Thirdly, although there is no agreed exact scientific standard, one can easily argue from the literature that an “average” serving of fruit or vegetables may have an ORAC as low as 400 or as high as 800 ORAC per serving. Companies that claim a 6000+ ORAC per serving and on the same label proclaim the phytonutrition of 15+ servings of fruits and vegetables are again likely either ignorant of the literature, or succumbed to the temptations of hyperbole.

Or perhaps they are just poor at math. One company selling to health professionals first lists 5000 mg of phytonutrient powders per 5 gm scoop, and then claims to *also* provide 600 mg of calcium! As stated earlier, phytonutrient powders, while having some vitamins and mineral content, are generally not rich in same. So if 600 mg of added calcium comes from its richest source, calcium carbonate, then there would need to be 1500 mg of it added, leaving only 3,500 mg for phytonutrients in the 5 gm scoop. But no calcium source is even listed on the label, nor is any room left for it in the 5 gm scoop supposedly already full of 5000 mg of phytonutrient powders!

Having said all this, if a company at this stage is not supplying recent antioxidant capacity test like ORAC or TEAC (Trolox Equivalent Antioxidant Capacity) on request, *the most likely reason is that the results are not something they want to publish or advertise.*

Doctor Beware

Your patients expect you to do your due diligence when it comes to recommending supplements. When you are dealing with large well established companies, you are likely in good hands. But some of the best products come from smaller companies focused on just a few products. What to look for then?

Visit the web site. Who is the founder? What are his/her credentials? Who are the executive team, the board of scientific advisors? What papers has the team published? For what professional journals do they write? At what conferences do they present?

If the company is called “Nurses for Your Wellness”, who are all the nurses and what are their credentials and standing?

How large is the company? Today, with a web site, a phone, email, a PO Box, and a mail order degree, most anyone can be in business, copying information and strategies from more legitimate concerns, fooling honest practitioners. Caveat emptor, doctor!

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- 1) USDA Jan 2005 Dietary Guidelines, <http://www.health.gov/dietaryguidelines/dga2005/document/>
- 2) Mercy Net Health Information Archives, Sisters of Mercy,
<http://www.mercy.net/healthinfo/archive/020903.asp>
- 3) 5-a-Day.com research facts <http://www.5aday.com/html/aboutpbh/researchfacts.php>
- 4) Ibid. 3
- 5) Ibid. 3
- 6) Men: You need 9 a Day!, Fitness and Freebies,
<http://www.fitnessandfreebies.com/food/articles/9aday.html>
- 7) 5-a- Day press release <http://www.5aday.org/html/press/pressrelease.php?recordid=129>
- 8) AMA's Position on Nutritional Supplements: Supplements Shown to Provide Valuable Health Benefits :Vitamins for Chronic Disease Prevention in Adults, Scientific Review June 19, 2002; Kathleen M. Fairfield, MD, DrPH; Robert H. Fletcher, MD, MSc; JAMA. 2002; 287:3116-3126.
- 9) Ibid. 2
- 10) Ibid. 3