Natural Versus Synthetic Supplements

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The study of how nutrients affect the body-preventing disease and illness, providing energy and vitality, aiding in repair and healing, and more - is increasingly gaining attention and respect among even mainstream medical researchers. Scientists used to believe that the major benefit of nutrients was to prevent deficiency diseases like rickets, beriberi, and scurvy. Some went as far as telling patients that foods and nutrients had nothing to do with disease prevention or with health. But now they are learning that nutrients play a far more complex, fundamental, and essential long-term role in health than had been expected. Undeniable evidence is accumulating that shows how nutrients influence the health and vibrancy of nearly every organ and tissue in the body, and how "these enigmatic chemicals may help forestall or even reverse many diseases of aging, including cancer, heart disease, osteoporosis, a flagging immune system, neurodegeneration, and other chronic disorders" (Angier, 1992).

Research data is accumulating that defines particular properties of individual nutrients, phytochemicals, and purified fractions of foods. Examples include sulforaphanes from broccoli, anthocyanidins from red wine and berries, allylsulfides in garlic and onions, and lycopene in tomatoes. But when these chemicals are isolated, the fractions never seem to work as well in people as do the whole foods, with regard to health. Multiple studies show the benefits from eating whole, natural foods like fruits, vegetables, nuts, seeds, whole grains, beans, and so on. Researchers approaching nutrition with a pharmaceutical mentality ask, "Which food ingredients are responsible for an observed effect? What is the active ingredient?" When a particular compound is isolated, it is not always clear that it is the most physiologically important ingredient. It is not known how a combination of isolated chemicals will react in the body. The combination of several purified substances or fractions may yield results that are quite different from those observed for foods. What are the effects of long-term consumption of large amounts of purified nutrients? What is the optimal level of consumption for an isolated food ingredient or manufactured imitation? These are pharmacological questions. Indeed, these purified fractions do perform more as pharmacological agents than as foods.

Foods are complex, interacting mixtures of compounds that contain many more physiologically-active nutrients, phytochemicals, and other known and unknown components than the so-called active ingredients that can be separated and studied in the laboratory. "Since researchers do not fully understand how the body uses individual chemicals, it is questionable whether purified components offer all of the benefits of a given food" (Jaret, 1998).

How can anyone determine how much of a given nutrient is needed by each unique individual? The philosophy "more is better," popular among many supplement users and clinicians, is inherently flawed. When it comes to nutrient fractions and particularly to synthetic duplicates, there are "limits to the benefits achievable through supplementation, even in deficient individuals, and toxicities may result from exuberant over-use" (Wood, 1999). When an isolated nutrient is ingested, most of it is rushed through the circulation and flushed out through the kidneys because the body does not recognize it as food, but rather as something foreign. Any remaining amounts of these isolated nutrients in the body must be processed. The body may try to use a fraction or synthetic by reassembling it with the parts of its otherwise natural complex in order to use it metabolically. In doing this, it may deplete the body of stores of important nutrients. And the effects are usually pharmacological in nature-stimulating, suppressing, or interfering with some biological function.

Thus, recent recommendations of the Food and Nutrition Board of the Institute of Medicine of the National Academy of Sciences include Dietary Reference Intakes (DRIs), which not only include Recommended Dietary Allowances (RDAs) of nutrients, but also tolerable upper levels of each nutrient (the point above which safety cannot be assured, and the risk of toxicity increases; Rosenberg, 2001). It is ironic that while many people are deficient in some nutrients, others appear to be exceeding the upper limits when it comes to isolated and/or synthetic fortification and supplement use. The range of acceptable intake can vary. But the point is that people need food, particularly nutrient-dense food, rather than fractionated chemicals or manufactured imitations, which can be toxic and cannot perform as well as food complexes in the body (Hathcock, 1997; Pargas, 1999). DRIs are simply not needed for real, whole foods.

Nutritional Supplements as Pharmaceuticals

The emerging role of the pharmacist in the compounding of natural products (supplements) brings the same kinds of challenges that the pharmaceutical industry faced in its early years - production controls, standardization, and bioavailability issues. Manufacturing these types of products offers new opportunities to both the pharmacist and the clinician. These types of products are prepared by pharmaceutical methods and standards. They are, in fact, drugs. Consumed in large amounts, fractionated and/or synthetic nutraceuticals can result in serious side effects, such as diarrhea, liver or nerve damage (often irreversible), headaches, birth defects, and much more. Furthermore, high-potency refined supplements can affect the absorption of other nutrients and lead to their depletion; often these are the normal related constituents of the natural complex (Denny, 1998) Excessive amounts (as defined by biochemical individuality and personal circumstances) can upset the delicate human biochemistry. Therefore, deficiency may not be overcome and toxicity may actually result.

There is a lot of buzz regarding so-called optimal intakes of nutrients - levels that may allow people to be ideally healthy and fit for a longer time. But the optimal intake of any nutrient varies substantially among individuals and indeed throughout an individual person's life from infancy to old age and according to life circumstances. Furthermore, what may be considered the optimal intake of one specific nutrient for a particular health challenge, say reducing the risk of heart disease, may not be optimal with regard to other health challenges, such as osteoporosis, cancer, or pulmonary disease. Use of an isolated nutrient in this way may actually increase the risk of certain diseases in some people.

Food does not present such problems. Presented with all the nutrients in a whole food, selective absorption allows the body to increase or decrease uptake of what is needed at that particular time. The minute amounts and powerful synergistic relationships of ingredients, as well as the dose - limiting bulk of fiber and the nutrient-satisfying nature of whole foods, make them safe and effective for all aspects of health. Foods contains ingredients that balance each other properly. Whole, natural foods do not imbalance or deplete or overly stimulate or excessively suppress. Food works.

Potency is not synonymous with quantity or quality. Even though a whole food may contain lower measurable amounts of specific compounds than a supplement containing isolated and/or concentrated components, the whole food provides the greatest health benefit and effectiveness - the greatest potency. Potency literally means power, force, and the ability to perform or to achieve a desired effect. Isolated vitamins, minerals, amino acids, phytochemicals, and other substances can be used in large or massive amounts in order to force or manipulate metabolic pathways in certain directions - to stimulate or suppress. Yet that effect is not nutritional; it is pharmacological. The body's cells are not being fed, they are being compelled.

No one can determine how much of a specific nutrient or food/herb constituent should be taken by an individual. Attempting to determine such a thing is based on the theory that specific symptoms of ill health are caused by specific, quantifiable deficiencies of specific single nutrients. This line of thought is inappropriate when it comes to real nutrition. Generally, there may be symptoms that provide clues regarding the nutritional complexes deficient in an individual. For example, pernicious anemia may be due to a vitamin B12 deficiency, but in reality, a person with this disorder also needs other B vitamins and associated nutrients. Scurvy may be a vitamin C deficiency, but it is the vitamin C complex, with all its cofactors and other related nutrients intact (i.e., citrus fruit), that is required, not ascorbic acid, the synthetic isolate of vitamin C. St. John's Wort may assist someone who has mild depression, but there are other factors that may play a role, including vitamin B complex and mineral deficiencies, adrenal fatigue, hormonal imbalance, stress, emotional issues, dietary habits, and more. Ultimately, each person needs all the vitamins, all the minerals, all the trace minerals, all the amino acids, all the fatty acids, all the enzymes, all the co-enzymes, all the known and unknown nutrients that only whole food complexes can provide.

In the vast majority of situations, there are multiple metabolic pathways involved in the same or similar sets of disease symptoms. However, the most perplexing and mind-boggling element in nutrition arises not only from the complexity of the underlying causes of illness and the distinct individuality of each human being, but also from the extreme complexity of nutritional components in foods. A leaf of spinach, for example, contains over 10,000 different chemical components. Other foods, whether of plant or animal origin, may be even more complex. Any given nutrient, whether a

vitamin, a mineral, or a single nutrient from any source, works in nature not in isolation but within a complex network of other metabolic modulators that may have a synergistic or a confounding effect. This complexity is so great that today's technologically-advanced scientific methods have not yet sorted out what goes on inside living foods and inside living cells of the human body. Nutrients work in balance with each other. Cofactors are just as important as the identifiable vitamins, minerals, and phytochemicals. Instead of considering all the interactions of nutrient components, scientists are seeking ways to make supplements work like drugs, isolated and on their own (Lee, 2002; Fuchs, 1998).

One case in point is osteoporosis prevention. A tremendous push is being made for women to get lots of calcium - in supplements as well as in foods. Yet it is often cited by critics that the incidence of osteoporosis is higher in countries where the diet appears to have plenty of dietary calcium, compared to many other countries with less calcium intake.

"The true cause of osteoporosis," says Lee (2002), "is not due to simple calcium deficiency; a myriad of other factors may contribute." A need for other nutrients like total protein, magnesium, trace minerals boron and manganese, essential fatty acids, vitamins of the C, D, and K complexes, and any number of their cofactors may be needed and lacking. Enzymes are essential to the metabolism of calcium and other nutrients. Inadequate production of hormones like estrogen, progesterone, testosterone, or adrenal, thyroid, parathyroid, and pituitary hormones may be involved in poor calcium metabolism, suggesting a need not for calcium but for nutritional support to hormone glands (Lee, 2002).

Most observational studies look at diet and then make assumptions about specific nutrient intake based on nutritional data AND on the particular nutrient(s) being studied at the time. There is very little research supporting real and significant benefits from taking supplements of isolated nutrients. Some studies measure blood or tissue levels of certain nutrients as an indicator of bioavailability, but without determining if the subject is actually able to use the nutrient in their biochemistry. Further, there is the problem that the health of the body's cells is not based solely on adequate levels of nutrients; equally important is decreasing the exposure to unhealthy agents. Chemical toxins, poisons, excessive stress, thermal insults, inadequate exercise, and a nutrient-poor diet are among a long list of factors that all contribute to illness, disease, aging, and death (Lee, 2002).

Conventional research attempts to focus on single factors, or determinants, even though the question or problem being addressed is multifaceted. And there is no way to know or test for all the factors involved in health. Real, whole food is the best source of nutrients for health, not isolated chemicals in pills or processed foods. Nature cannot be fooled. And Nature cannot be duplicated.

One needs to be aware that there are several types of food supplements. High quality real food supplements are well worth the higher prices they entail and the effort required to find them. But some supplements contain standardized isolated or synthetic vitamins, minerals, or other chemical nutrients along with fillers and other additives. This boosts sales and price, but is equivalent to taking a fractionated chemical supplement. Other food supplements are produced by adding isolated chemical nutrients to a liquid broth containing yeast. The chemicals are incorporated into the yeast as it grows. Then the yeast is dried and the residue is pressed into tablets along with herbs, dried foods, binders, additives, and other common manufacturing substances. The yeast-bound nutrients are no different than fractionated chemical supplements, with perhaps better absorption. The concept is still pharmacological-one could just as easily place aspirin or antibiotic in growing yeast and produce a drug-food.

There are a few product manufacturers that actually use real foods and whole herbs to produce tablets, capsules, or powders. They are low potency as far as the numbers on the label go but are high potency with respect to the symbiotic whole food complexes they contain.

This article has offered a brief overview of the nature of today's nutritional supplements. Hopefully, it is a starting point for readers to educate themselves further to become supplement savvy.

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