Synthetic vs. Natural Supplements - Is There a Difference?
by Dr. Gary Farr on September 18, 2003

Synthetic vs. Natural Supplements

Synthetic VS. Natural - is there a Difference?

There isn't a much more debated topic in the area of nutrition than the synthetic vs. natural vitamin debate. Actually the real culprit behind most of the false information is the Food and Drug Administration, the pharmaceutical industry, and the food producers. In this section we'll explore and give scientific references that will clearly give you certainty that you should not be taking supplements that are derived from synthetic sources. In fact, we'll demonstrate that you are in fact creating deficiencies in your nutritional state by doing so.

Vitamins are plentiful and cheap and you can get them at your local grocery store. Practically everything in the grocery store is enriched with vitamins anyway, so we shouldn't be missing a thing. Right? But if we're taking such great care of our health, why are degenerative diseases such as arthritis and heart disease occurring at an alarming rate and fertility rates falling drastically?

The vitamin phenomenon started after the turn of the century during the beginning of the industrial revolution. Science found ways to create molecular duplicates or copies of vitamins occurring in nature. Most vitamins can now be synthesized and are made from substances ranging from corn syrup to coal tar.

These synthesized duplicates differ from natural vitamins in two essential ways. First, the molecular polarity of the substance has changed, rendering it a "mirror image" of the original molecule. Dr. Royal Lee, founder of Standard Process®, discovered this mirror image attribute of vitamins while studying light refraction the 1930's. While this may seem like a minor issue, it is not. The body continues to look for the shape of the original molecule, and the man-made substance becomes a burden to be excreted rather than a help to healing.

Second, each vitamin occurring in nature comes in a complex form easily assimilable by the human body. Take vitamin C for example. Naturally occurring in citrus fruits, acerola cherries, rose hips and other fruits and vegetables, this vitamin comes in a package containing vitamin P factors such as bioflavonoids and rutin, vitamin K, vitamin J, various enzymes and coenzymes plus a small amount of ascorbic acid, the antioxidant of the complex. Vitamin C is rated according to the amount of ascorbic acid it contains.

Ascorbic acid is not vitamin C, ascorbic acid is ascorbic acid, a fraction of the
biologically utilizable natural vitamin C complex. Furthermore, most ascorbic acid on the market is produced synthetically.

**Did You Know?**

- Synthetic C supplements promote free radical generation?
- Alpha-tocopherol is only one of seven tocopherols found in vitamin E complex, but it is not the active ingredient. Taking alpha-tocopherol by itself actually creates a vitamin deficiency.
- Many biochemical researchers, nutritionists and herbalists have noted that without the whole-food complex, the body will never achieve whole nutrition, as vitamin supplements lack the rest of the complex.
- If you don't understand what's on a supplement label, and most of the print reads as chemicals, chances are you're not purchasing a whole food supplement. The truth is that many companies tout their products as whole foods when they're offering mixtures of foods along with isolates. And some so-called "whole-food" supplements are not grown in soil, under natural, traditional farming conditions. That's why we only use whole food supplements from Standard Process, Inc.
- Slaves recruited to build the Great Pyramids of Egypt subsisted largely on this odorous herb. Garlic, in fact, may be what kept them alive. Modern medical anthropologists credit the plant with helping to prevent epidemic diseases in the ancient world. That's because garlic contains bacteria-fighting allicin, as well as vitamin C, calcium, magnesium and potassium.

According to The New York Times, reporting on another study, a team of British pathologists at the University of Leicester studied 30 healthy men and women for six weeks, giving them 400 milligrams of vitamin C daily in the form of ascorbic acid. They found that at this level, vitamin C promoted damage to the DNA in these individuals. Synthetic B vitamins have performed similarly. Writing in a Pennsylvania newspaper, a medical columnist who had been medical officer in a North Korean prisoner-of-war camp during the Korean conflict, found his fellow prisoners contracting Beriberi, a disease caused by a deficiency of Vitamin B. He obtained Thiamine Hydrochloride, a synthetic form of vitamin B, from the Red Cross, and administered it to the sickest men. No positive change was seen and the men continued to get worse. The guards suggested rice polish, a natural source of vitamin B, which he administered in small amounts. The Beriberi symptoms abated within a week.
Vitamin E is another example. The Atlanta Journal and Constitution summarized the April, 1997 Proceedings of the National Academy of Sciences with a headline proclaiming "Megadoses of E May Be Harmful, A Study Indicates." The story discussed that individuals taking vitamin E supplements might be depleting their bodies of other forms of the vitamin that perform unique and vital chemical tasks. The author mentions that vitamin E supplements were administered in the form of alpha-tocopherol. Alpha-tocopherol is one of seven tocopherols, the antioxidants of the vitamin E complex, but it is not the active ingredient. Natural vitamin E contains seven tocopherols plus polyunsaturated fatty acids, vitamins F, A and K and forms of vitamin D and manganese.

The body is designed to utilize food in its whole form. If incomplete foods such as refined alpha-tocopherol are digested, the missing factors are borrowed from tissue reserves in order to make the partial food usable.

In a Spring 1994 Finnish study published in the New England Journal of Medicine synthetic vitamin E was supplied by a major pharmaceutical company. In the study, users of the product had a statistically significant loss of protection from lung cancer, stroke and other degenerative diseases.

A whole-food supplement, is one comprised of foods (not extracts, but entire foods) that have been concentrated into supplemental form. Isolated supplements are singular (or groups of individual) vitamins, minerals and/or amino acids. Whole foods contain vitamins, but vitamins never contain the rest of the whole-food "complex."

Many biochemical researchers, nutritionists and herbalists have noted that without the whole-food complex, the body will never achieve whole nutrition, as vitamin supplements lack the rest of the complex. Richard Murray, DC, an avid biochemical researcher and lecturer for the past 30 years, taught that isolated vitamins eventually lead to biochemical imbalances and consequential nutritional deficiencies, as the body is forced to surrender its stores of nutrients in order to make any isolated vitamin work. Dr. Murray went so far as to state that the use of isolated/synthetic vitamins amounts to the practice of "chemistry," wherein the use of whole-food supplements translates into the practice of biochemistry. Whole foods are alive with enzyme activity, while isolated vitamins are not living substances in the least. Vitamins do not resemble foods, but they resemble parts of foods. It is the rest of the food complex - the other parts - in which proponents of whole foods are interested. Retired USDA botanist, James Duke, PhD, author of The Green Pharmacy, agrees: "Vitamins and phytochemicals are better taken in their evolutionary context - as they occur in plants - not isolated and out of context."

Although it is true that isolated vitamin supplementation "works," we must define the word "work."

Certainly, experiments have shown the efficacy of vitamins against symptomatology, but some experts claim that this is a matter of practicing pharmacology, not nutrition. Nutrition relates to nourishment by foods, not isolated chemicals. Whole foods work biochemically and harmoniously, while isolated vitamins always run the risk of creating biochemical imbalances.
When speaking of minerals, there is the added risk of toxicity, as minerals must enjoy a biochemical balance to promote health. Zinc; copper; iron; calcium; magnesium; phosphorus; and other minerals are easily upset and offset by an improper ratio of minerals in the body. Taking isolated minerals and mineral toddies, even in a multivitamin/mineral supplement, is a biochemical risk. Too much magnesium or phosphorus may imbalance calcium; too much copper may imbalance vitamin C; zinc; manganese; molybdenum; vitamin B6; and iron; too much zinc can lead to copper deficiency, and so on. Because nutrients in foods are balanced within the food complex, the risk of toxicity is very low.

Conversely, trying to balance the body's biochemistry with mineral and vitamin supplements is very difficult because of the dynamic complexity of the human organism; the daily diet; exposure to environmental poisons; stress factors; genetics, etc.

This is the reason we use a whole-food complex supplement containing a multitude of plant foods known to be mineral-rich, and also include synergistic vitamins; amino acids; trace mineral activators; and enzymes. We have found that nature's design is a safer choice due its inherent intelligence in providing a variety of nutrients, synergists and low dosages. When using whole-food supplements, doctors must realize a paradigm shift and the need to stop regarding foods as chemicals. We have to give up the reductionist line of thinking and grasp the holistic perspective, understanding that the "more is better" attitude does not apply to food; vitamins; minerals; or amino acids. The quality of the food complex becomes more important than the quantity of individual vitamins, minerals or amino acids.

As with all supplements, buyer beware. If you don't understand what's on a supplement label, and most of the print reads as chemicals, chances are you're not purchasing a whole food supplement. The truth is that many companies tout their products as whole foods when they're offering mixtures of foods along with isolates. And some so-called "whole-food" supplements are not grown in soil, under natural, traditional farming conditions. The way to tell the difference is rather simple: A whole food is just that - a food like a carrot, beet, celery or potato flour, for instance. Isolates are stated on the label by their chemical names, such as vitamin A palmitate; mixed tocopherols; ascorbic acid; pyridoxine; niacin; niacinamide; etc.

The list goes on and on. From sterility, to reduced life span, to poorer fur in animals, to malnutrition, synthetic vitamins are being found not only unhelpful, but downright damaging. Living beings need the whole, natural vitamin complex. This is what we were designed for, what we expect, and what we will respond to. When the body can get vitamins in the form it expects - in its entirety, including all trace minerals, enzymes and other factors - much less is required to achieve results.

**More on Natural vs. Synthetic**

Living things can be produced only from living things, never from non-living matter. Chemically-pure, refined, fractionated, and synthetic vitamins are dead, inert materials, non-perishable and devoid of enzymes.
Natural foods contain live vitamins, organic minerals, enzymes, and other vital, functional, alive components, all organized (organic) by the sun, rain, water, soil's nutrients, and living bacteria.

**Some Examples of Natural vs. Synthetic**

1) Live, natural complexes are colloidal, protein in nature, and usually exist as enzymes or coenzymes. Heat, pasteurization, and steam sterilization destroy enzyme and enzyme activators, so supplements produced utilizing any of these procedures are not vitamin complexes.

2) The crystalline or chemically-pure vitamin, once separated from its protein (enzyme) component, has its biological activity – function - destroyed.

3) The natural complex contains trace mineral activators. Without these activators, the vitamin fails as a biochemical catalyst and function ceases.

4) Chemically-pure vitamins taken into the body must be "put in the proper combination" (recombined, if possible) with the other natural components of that vitamin complex - that is, those components missing from the chemically-pure vitamins - before they can function as a vitamin. This would "use up" from the body's reserves, those missing, natural factors, leading to, if taken for a long time or if a marginal deficiency already exists, a deficiency of those components. Therefore, since these synergistic factors are normally an integral part of the vitamin complex necessary to its form and function, a deficiency of that vitamin itself may develop. It is ironic that a deficit of the very vitamin taken occurs because of taking a chemically-pure form!

A vitamin supplement, then, cannot simply be an individual chemical or several chemicals. Supplements must be food concentrates, intact, integrated, with their vitamin complexes incorporated so as to retain their functional and nutritional integrity. Foods contain innumerable substances, many of which are - and will always be - unknown, that produce a combined effect to which a single ingredient cannot compare, leading to imbalanced effects. Therefore, a synthetic vitamin can only be used for a drug effect: it can mask or cover over symptoms, but does not alleviate the cause of the illness, disease, insult, or injury.

**About Vitamin E**

Vitamin E and Oilseed By-Products

Oilseed By-products: Oilseeds contain medicinal compounds that affect many organs of the human body. Oil refining removes 32% to over 95% of these nutritional lipids that end up as by-products of the process. These by-products include phosphatidylcholine, phosphatidylserine, phosphatidylinositol, b-carotene, b-sitosterol, g-oryzanol, a-tocopherol and g-tocotrienol, which are active ingredients in prescription and over-the-counter drugs as well as dietary supplements and functional foods.

Individual by-products play various roles in the human body such as providing necessary nutrients, lowering blood lipids and cholesterol, preventing liver damage, and decreasing cancer risks.
In the case of benign prostatic hyperplasia (enlargement of the prostate gland), beta-sitosterol improves symptoms and urinary flow parameters. Erythropoietic protoporphyria (EP), a genetic disorder, results in high concentrations of protoporphyrin in blood plasma. Symptoms include severe photosensitivity (sensitivity to light), which beta-carotene can reduce. Menopausal disorders and irritable bowel syndrome are improved by g-oryzanol.

Phosphatidylcholine, or lecithin, provides dietary choline (a B vitamin) for which the National Academy of Sciences has recently established a Dietary Reference Intake (DRI) of 550 mg/day for men and 425 mg/day for women\(^1\). The Food and Nutrition Board will be reviewing recommended dietary intakes for certain lipids during 2000, and researchers expect that RDAs for long-chain PUFA may be forthcoming.

Establishing recommended intakes for any single nutrient can be complex, as illustrated by vitamin E. Vitamin E (alpha-tocopherol) may decrease the rate of functional decline in Alzheimer’s disease\(^2\), reduce the risk of cardiovascular disease, and prevent/reverse hemolytic anemia in neonates.

"However, the optimum level of dietary vitamin E to support wellness is complicated because alpha-tocopherol is not the whole story," said Andreas Papas, Ph.D., Health and Nutrition at Eastman Chemical Company, Kingsport, Tennessee, during his presentation, "Tocopherols and Tocotrienols in Nutrition and Health." The other tocopherols and tocotrienols that comprise the vitamin E family of compounds support alpha-tocopherol’s antioxidant activity and also have other unique functions for nutrition and health. Although their actions are not clearly understood yet, strong evidence points to their role in the prevention of some chronic diseases such as heart disease and some cancers, he added.

"Demand for oil refining by-products is on the rise. They are increasingly used in nutraceuticals and functional foods. However, they are generated at the expense of the nutritional quality of the oil," said R. D. (Bob) Reichert, Ph.D., Industrial Research Assistance Program, National Research Council of Canada, Ottawa, Ontario, in his presentation, "Vegetable Oil Processing, Medicine and Functional Foods?" "Whereas frying oils need rigorous refining to remove volatiles that create unpleasant working conditions in fast-food kitchens, salad oils probably do not need such rigorous refining," Reichert said.

Vitamin E Synthetic vs. Natural

Researchers have long known that natural vitamin E, milligram for milligram, is about 36 percent more potent than the synthetic form of the vitamin. In fact, the "international unit," or IU, standard was developed to compensate for these differences.

But two new studies using different groups of people - not laboratory animals - have found that natural vitamin E is utilized twice as efficiently as the synthetic form.

"Natural vitamin E may cost twice as much, but you get twice as much bang for your buck," Graham W. Burton, PhD, told The Nutrition Reporter. Burton, a researcher at the National Research Council of Canada, Ottawa, directed one of the studies.
In the study, Burton and his American colleagues gave five healthy men and women a single 30 mg dose of vitamin E, which was half natural and half synthetic. A month later, the same people took an identical vitamin E supplement for eight days.

Another five subjects took a single 300 mg dose of vitamin E, which was also half natural and half synthetic. A month later, they took an identical vitamin E supplement for eight days.

By biochemically labeling the natural and synthetic vitamin E supplements, Burton and his colleagues were able to tell them apart and to also distinguish dietary vitamin E.

While natural and synthetic vitamin E were absorbed equally well through the digestive tract, the liver selected for the natural form over the synthetic: blood levels of natural vitamin E were consistently twice those of the synthetic form.

"What we found was that blood and organ levels of natural vitamin E were almost double those of synthetic vitamin E, and they were consistently so," Burton explained. "The beauty of this study design is that each participant served as both a control and experimental subject."

A similar trend was found in the blood of 22 surgical patients given the half-natural, half-synthetic vitamin E supplements for up to six weeks and in two terminally ill patients given the supplements for one to two years.

Tissue levels of natural vitamin E - based on organs removed during surgery - also increased compared with the synthetic. However, it appeared to take at least a year or two for the 2:1 natural-to-synthetic ratio to develop in tissues.

In the other study, Robert V. Acuff, MD, of East Tennessee State University, Johnson City, gave vitamin E supplements - again, half natural and half synthetic - to 15 pregnant women five days before giving birth. At delivery, natural vitamin E levels in the mothers' blood were consistently double those of the synthetic vitamin. Furthermore, natural vitamin E levels in the placental cords was almost 3.5 times higher than the synthetic form.

**More on Vitamin E**

In an article appearing in Circulation, August 19, 2003:

Having high levels of vitamin E or beta-carotene (and compounds like it) is no guarantee that you won't have a heart attack, new research shows. In fact, high levels of one type of vitamin E -- known as gamma-tocopherol -- may actually increase the risk.

Because these chemicals are antioxidants, it has been thought that they may protect against the formation of plaque that can block arteries, by preventing the oxidation of LDL ("bad") cholesterol. Although several studies have examined the link between beta-carotene and heart disease, relatively few have looked at the effects of other so-called carotenoids.

To look into the question, Dr. Jing Ma from Harvard University in Boston, and others, turned to the Physicians' Health Study, which began in 1982 and followed participants for
up to 13 years. The researchers compared the levels of carotenoids and tocopherols in the blood of 531 men who later had a heart attack with those of a control group of 531 similar men who did not have a heart attack.

Blood levels of five major carotenoids were measured, as well as levels of retinol, alpha-tocopherol and gamma-tocopherol.

"Based on the antioxidant hypothesis, we expected people with high levels of these compounds to be at low risk for developing heart disease," Dr. Ma told Reuters Health. "But, this is not what we found."

Overall, there were was no evidence that the carotenoids or tocopherols protected against heart attacks, the team reports in the American Heart Association.

However, among current and former smokers, higher levels of beta-carotene did lower the risk of a heart attack.

On the other hand, high gamma-tocopherol levels were actually linked to an increased risk. But gamma-tocopherol itself may not actually be harmful, Ma noted. "Gamma-tocopherol may simply represent a marker for trans-fat intake," which is known to up the risk for heart disease.

"These findings should not discourage people from eating fruits and vegetables, as there are probably other components present that protect against heart disease," she stressed. "The bulk of evidence still supports a beneficial effect for eating such foods."

What can we learn by this article? Once again, that fractionated vitamins work differently than their whole food counterparts.

References
1. Dietary Reference Intakes for Thiamine, Riboflavin, Niacin, Vitamin B6, Folate, Vitamin B12, Pantothenic Acid, Biotin, and Choline, NAS, Washington USA (IN PRESS).
6. King, Michael W.,PhD. Dept of Medical Biochemistry, Indiana State University, Nov. 1999.

This article is copyrighted.