INTRODUCTION TO VITAMINS AND RELATED FOOD FACTORS

NUTRIENTS WORK IN "TEAMS" TO SUPPORT OPTIMAL HEALTH

Long before vitamins were discovered, people used certain foods to prevent and even cure disease. The Greek physician Hippocrates prescribed liver for night blindness more than 2,000 years before the discovery of its curative component, vitamin A. Similarly, the Chinese used cod liver oil, a source of vitamin D, to prevent and treat rickets long before they knew the cause of this bone-deforming condition. And in 1747, more than a century before vitamin C was isolated, sailors took spoonfuls of citrus juice to combat scurvy.

When ancient healers administered foods to restore health, they did not know that the foods contained vitamins. And in nature, vitamins are never found alone. They exist with related food factors which work together in nutrient "teams" to support health. Take the orange, for instance. Both flavonoids and vitamin C are "packaged" together in an orange, with flavonoids enhancing the absorption and utilization of vitamin C. Both nutrients work together to help protect body fluids and the watery portions of cells from oxidative damage. What's more, even though vitamin C is a water-soluble antioxidant, it helps "recycle" fat-soluble vitamin E, which in turn works with carotenoids and other fat-soluble nutrients to help protect the lipid regions of cells, particularly their membranes.

Foods do not contain isolated nutrients, and neither should supplements. To assure optimal nutrition from supplements, "helper" nutrients should be present, just as they are in whole foods. Whole-food sources are the best way to be sure your body is getting all the nutrient "team" members as they naturally occur in the human food chain.

TO BE OUR HEALTHY BEST, WE NEED ALL OF THE VITAMINS

What are vitamins, and how do they help keep us healthy? Whereas minerals are derived from earth elements, vitamins come from plants and animals. With few exceptions, the body cannot make them, so we must consume them in foods or supplements on a regular and continuous basis.

Vitamins are essential for normal body function, including growth, repair, and maintenance of tissues. They are directly involved in metabolic regulation, energy and enzyme production, reproduction, vision, digestion, glandular activity, detoxification, immune function, and other vital processes.

Some vitamins are required for the function of enzymes, which make it possible for the body to carry out most of its biochemical reactions. Vitamin B_6, for instance, is required for more than half of the body's enzymatic reactions, including most of those involving the metabolism of amino acids. Similarly, the B-vitamin folic acid is required by the enzymes that biosynthesize our genetic material (DNA).

Some vitamins are also antioxidants, protecting the body from highly reactive free-radical molecules associated with cellular damage and disease. Free radicals constantly form in almost every cell of the body at an astonishing rate. If their target is DNA, the likelihood of cancer increases. If the target is low-density lipoprotein in the blood, the likelihood of atherosclerosis and its consequences increases.

Insufficient vitamin intakes can lead to classical deficiency symptoms, including scurvy (resulting from insufficient vitamin C), beriberi (thiamin), pellagra (niacin), blindness (vitamin A), and rickets in children and osteomalacia in adults (vitamin D). Even marginal vitamin deficiencies may, over time, result in serious conditions. Suboptimal vitamin intakes have been associated with cancer, heart disease, stroke, osteoporosis, cataracts, macular degeneration, and many other chronic diseases.

Vitamins are either water-soluble (B-complex vitamins, vitamin C) or fat-soluble (vitamins A, D, E, K). The body can only store fat-soluble vitamins. As water-soluble vitamins cannot be stored, any portion that is not immediately used is eliminated.

FOOD-RELATED FACTORS BENEFIT HEALTH IN UNIQUE WAYS

Besides an abundance of vitamins, whole foods also contain minerals, enzymes, proteins, carbohydrates, and other health-promoting substances. Of special interest are phytonutrients, food-related factors found only in plants. Certain foods — including carrots, tomatoes, spinach, grapes, berries, green tea, broccoli, garlic, onions, and soybeans — contain phytonutrients known to support optimal health. Diets plentiful in these foods may reduce risks for age-related degenerative diseases, such as cancer, cardiovascular disease, and cataracts, and may enhance immunity and tissue protection. Some healthful phytonutrients include:

- **Carotenoids.** These fat-soluble antioxidants are yellow, orange, and red pigments in fruits and vegetables.
- **Flavonoids.** These water-soluble antioxidants in fruits, vegetables, tea, and wine are colorful pigments responsible for brilliant blues, purples, and greens, as well as yellows, oranges, and reds which cannot be attributed to carotenoids.
- **Compounds found in cruciferous vegetables.** Sulforaphane and indole carbinols from broccoli, cauliflower, Brussels sprouts, and other cruciferous vegetables may support optimal health.

- **Chalcones from licorice root.** These relatives of antioxidant flavonoids may help prevent damage to genetic material (DNA).
- **Isoflavones.** Genistein, an isoflavone in soybeans, may hinder the growth of the capillaries that supply tumors.
- **Sulfur compounds from Allium vegetables.** Allicin, a pungent compound in garlic, onions, leeks, and chives, may help protect health.
- **Terpenes.** Certain plant oils, such as d-limonene from citrus fruits, may boost levels of anti-cancer enzymes.

In addition, important **lipids and sterols** (another link in the Chain of Life) are frequently found only in phytonutrient sources. A few examples are oil-soluble components of wheat germ, rice bran, and soybeans which are essential for optimal health and cellular function.

Your Nutrient Needs Are As Individual As You Are

We all have different nutritional requirements. Unfortunately, most daily diets fail to provide even the Recommended Dietary Allowance (RDA) for many important nutrients — and the RDA is just the *minimum* needed to prevent the appearance of deficiency symptoms! Over time, even marginal deficiencies can have devastating effects. (A prolonged deficiency of *any* vitamin will result in disease.) What's more, for many nutrients, the Optimal Daily Intake (ODI) — the amount leading to the best health for most people — may be several times greater than the RDA (see: *The Need for Supplementation*). The bottom line is that our dietary "gaps" are really huge chasms. This problem is especially serious for certain groups tending to have below-average vitamin pools:

- **Smokers** (often deficient in carotenoids, folic acid, vitamins B_6, C, and E)
- **Dieters** (Potentially any or all nutrients. It is almost impossible to meet nutrient recommendations if consuming less than 1,200 calories per day.)
- **Adolescents** (folic acid, vitamin A)
- **Drinkers of alcohol-3 or more drinks per week** (thiamin, vitamins A, B_6, C, and D, folic acid, carotenoids)
- **Diabetics** (vitamins B_6, C, D, and E)
- **The elderly** (vitamins C, D, and E, folic acid)
- **Users of oral contraceptives** (vitamin B_6, C, folic acid, carotenoids)
- **Pregnant women** (all, especially folic acid)
- **Premature infants** (vitamins A, B_6, C, E, folic acid)
- **Strict vegetarians** (vitamins B_{12} and D)

CAN ONE NUTRIENT MATTER MUCH? THE CASE FOR FOLIC ACID

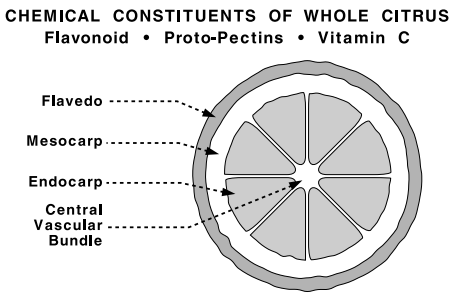
Can vitamins and food-related factors really have a major impact on the quality of life? The answer is an unequivocal *YES!* Folic acid is a great example. At 0.4 mg daily, folic acid could prevent 2,000 birth defects annually. And an estimated 56,000 fewer Americans would die from heart attacks and strokes each year if people increased their consumption of folic acid and other B-vitamins (B_{12}, B_6). "If everybody took enough folic acid we could save more Americans than were killed in Vietnam," says Godfrey Oakley of the Centers for Disease Control and Prevention.

The GNLD Difference in Vitamins and Related Food Factors

Supplements can go a long way towards supporting optimal health. They are a proven-effective way to address nutrient deficiencies and provide "nutritional insurance" when the diet is lacking. Simply the best, GNLD's vitamins and related food factors set the quality standard for our industry (see: *The GNLD Difference in Quality*).

Nutrients the Way Nature Intended

At GNLD, we make every effort to provide nutrients in the format that the body can best use. Our world-renowned Scientific Advisory Board uses nature's "blueprint" to guide the research and development of our premium-quality, biocompatible supplements. To create products which are safe and effective over a lifetime of use, we look first to rich, natural sources from the human food chain. Because the absorption and utilization of one nutrient often depends on the presence of others, we utilize "helper" nutrients that exist in whole foods to maximize the nutritional value of our supplements. The SAB also makes sure all GNLD products feature safe, responsible potencies, rather than "megadoses."

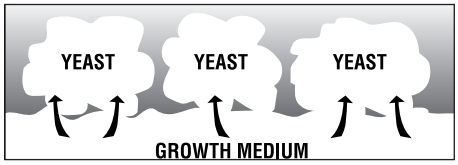


Neo-Plex Concentrate to Get More Out of Your Vitamin C

GNLD's vitamin C products exemplify our commitment to complete nutrition. When you eat an orange — one of nature's best vitamin C sources — you get more than just isolated vitamin C. All GNLD vitamin C products include our exclusive Neo-Plex Concentrate — virtually everything from whole oranges but the water! With juice, vitamin C, flavedo, mesocarp, endocarp, protopectins, bioflavonoids, and other natural factors, Neo-Plex Concentrate provides factors that help your body absorb and utilize vitamin C. Its presence in all of our vitamin C products represents a GNLD difference in quality.

Biologically-Bound Yeast for Balance and High Potency

GNLD's B-vitamin products exemplify our commitment to responsible potencies and natural sources. In nature, the members of the B-vitamin "family" occur in whole foods in balanced ratios. This balance is crucial to the metabolism of B-vitamins, as an excess of one B-vitamin may cause excessive elimination of the others. GNLD begins with a rich, whole-food source — the nutritional yeast *Saccharomyces cerevisiae,* and through a unique process of growing, harvesting and drying yeast, B-vitamins are "biologically-bound" to create a natural, high-potency B-complex source.

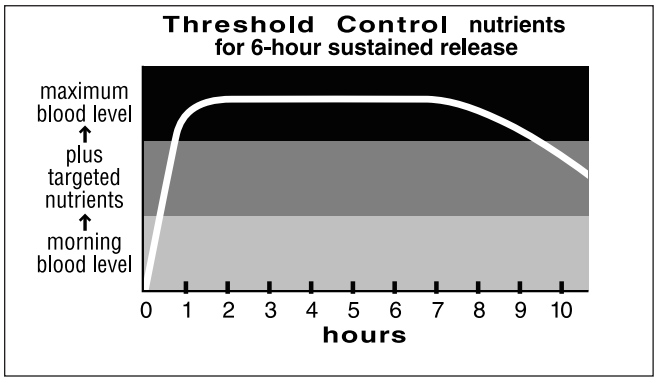


"Threshold Control" Technology Provides Sustained Release

When the body receives more nutrients than it can use, it rapidly excretes the rest. The result? Expensive urine! To resolve this problem and make sure you get the greatest nutritional value from the supplements you take, GNLD researchers developed a special matrix which gradually releases vitamins over a period of six hours or more. The resulting "Threshold Control" formulations allow for the dependable, regulated release of nutrients. With waste minimized, nutrients are made available at a steady rate.

Nutrient Family Approach For Biocompatibility

In nature, alpha-tocopherol doesn't exist in isolation. It's part of the vitamin E "family," which includes seven other tocopherols and tocotrienols. Similarly, beta-carotene is never found alone in human-food-chain fruits and vegetables.



Instead, it exists with the other carotenoid family members, such as alpha-, gamma-, and zeta-carotene, lycopene, lutein, zeaxanthin, and beta-cryptoxanthin. The same is true of flavonoids, the B-vitamins, and many other important nutrients. As individual family "members" confer different benefits, health protection is greater when diverse nutrients are present.

The NutriMax Process™ Assures Freshness

Our exclusive NutriMax Process was designed to retain the maximal nutrient value of certain raw materials. This process protects potency and freshness with oxygen-free encapsulation. A GNLD innovation in manufacturing, the NutriMax Process is used in the production of our world-renowned and proven-effective Carotenoid Complex™.

The GNLD Scientific Advisory Board has worked hard to formulate vitamins and related food factors that you can count on time and time again. Their efforts have not been in vain. Safe, effective, and biocompatible, GNLD supplements are now the global standard for quality. Enjoy them in good health!