



# FAST FACTS ABOUT VITAMIN C

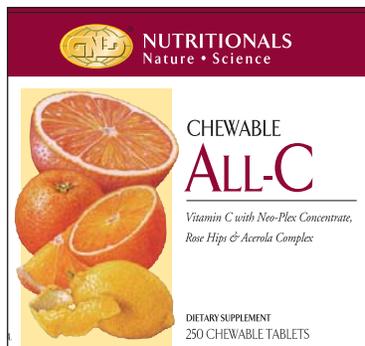
Vitamin C, the body’s main water-soluble antioxidant, strengthens immunity, aids wound healing, and supports overall good health. Besides its own powerful antioxidant role, it is an integral part of the body’s antioxidant “defense team” and helps “recharge” the body’s main fat-soluble antioxidant, vitamin E. Vitamin C is needed to make collagen, the cellular “cement” that provides structure to skin, bones, blood vessels, and other tissues. Diets rich in vitamin C are linked to increased longevity and decreased risks for cancer, stroke, atherosclerosis, and cataracts. As vitamin C is water-soluble, it can’t be stored in the body for long — it must be replenished daily. As important as this “protector” nutrient is, more than half of us do not consume the Recommended Dietary Allowance each day. GNLD provides three excellent choices to address this “gap”: Threshold Controlled Super C for sustained release over six hours or more, Powdered C to boost the vitamin C content of foods and beverages, and delicious All-C for a chewable option. Our products feature high-potency, high-purity vitamin C plus vitamin C-related factors from whole citrus fruits. All GNLD vitamin C products include our exclusive Neo-Plex Concentrate — virtually everything from whole oranges but the water — for better absorption and utilization.

## WHY VITAMIN C?

- As an **essential nutrient**, vitamin C is required for overall vitality and plays important roles in maintaining the health of connective tissue, blood vessels, immune system cells, gums, teeth, bones, and other tissues and organs.
- As a **potent water-soluble antioxidant**, vitamin C helps protect body fluids and the watery portions of cells from free-radical damage

## WHY GNLD VITAMIN C PRODUCTS?

- **High-potency, high-purity vitamin C and vitamin C-related factors from oranges, lemons, and grapefruit enhance bioavailability.** All-C and Powdered C also contain rose hips and acerola cherries — nature’s richest vitamin C sources!
- **GNLD’s exclusive Neo-Plex Concentrate provides virtually everything from whole oranges except the water:** juice factors (vitamin C, bioflavonoids, etc.) and rind and pulp factors (including flavedo, mesocarp, endocarp, and protopectins).
- **Other whole-food bioflavonoids assure broad-spectrum protection** — rutin from buckwheat, hesperidin from grapefruit, and bioflavonoid complex from lemon.
- **Long-term potency assured.** Made with 10-20% more vitamin C than claimed by the label to assure full potency throughout the guaranteed shelf life.
- **Three potencies, three forms.**  
Available as chewable tablets, a tangy powder, and our exclusive Threshold-Controlled tablets.



<http://www.GNLD-NeoLife.com>



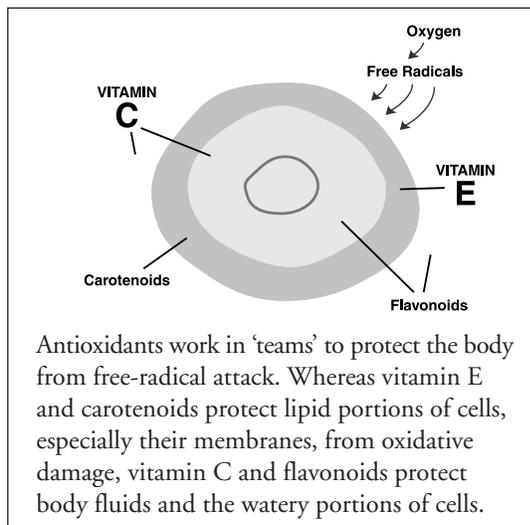
# THE VITAMIN C STORY

## VITAMIN C CAN MEAN THE DIFFERENCE BETWEEN HEALTH AND DISEASE

Throughout history, scurvy, or severe vitamin C deficiency, caused massive suffering. About 450 B.C., the Greek physician Hippocrates first described its symptoms: bleeding gums, tooth loss, fragile bones, and muscle and joint pain. Scurvy also caused weight loss, irritability, fatigue, impaired mental function, shortness of breath, bruising, poor wound healing, internal bleeding, and sudden death from hemorrhage or heart failure. Infamous among sailors on long voyages where fresh fruits and vegetables were luxuries (they spoiled too quickly), scurvy was a scourge of soldiers, explorers, and settlers alike. Certain foods — especially oranges, lemons, and limes — soon became known for their ability to prevent or cure scurvy. By 1795, the British Royal Navy was required to provide one ounce of lime juice in every sailor's daily ration — hence the nickname *limeys*.

In the early 20th century, scientists isolated vitamin C and showed that it was the agent that cured scurvy. Vitamin C was first synthesized in 1933, and the official name for vitamin C was established as *ascorbic acid* in 1938. Since then, researchers have discovered numerous critical health-maintaining roles for vitamin C.

They now know that vitamin C is a key member of the body's antioxidant defense team, working with flavonoids to protect body fluids and cells' watery portions from oxidative damage. It is concentrated in the adrenal glands (responsible for our stress response), eyes, liver, spleen, intestine, bone marrow, pancreas, thymus, kidneys, areas of the brain, and in the white blood cells that make up our immune defenses against bacteria, viruses, and even cancer. Vitamin C-rich diets have been linked to reduced risks for cataracts, cancer, atherosclerosis, and stroke — all conditions where oxidative damage plays a role.



## BEYOND SCURVY: MODERN ROLES FOR VITAMIN C

Nobel Prize winner Linus Pauling, who first proposed that vitamin C might keep sniffles, sneezes, and even cancer at bay, generated a flurry of research with the publication of his 1970 book *Vitamin C and the Common Cold and the Flu*. Since then, research has shown many important functions for vitamin C:

- Needed to form **collagen**, the major protein of connective tissue, cartilage, and bone. Collagen, which makes up more than half of the protein in humans, gives skin its elasticity and binds cells together in organs and tissues, much as mortar bonds bricks.
- **Antioxidant protection** of cells, lipids, proteins, and DNA from free-radical damage linked to cancer, cardiovascular disease, cataracts, etc., as well as declining immunity. May help protect vitamins A and E and polyunsaturated fatty acids from oxidation.
- Needed to make **carnitine**, an agent that plays a key role in human metabolism.
- Needed to make the neurotransmitters **epinephrine, norepinephrine, and serotonin**.
- Involved in hormone synthesis and/or release from adrenal glands — part of the body's **response to stress**.
- Necessary for **iron** absorption, transport, and storage.
- Plays a role in the metabolism of the amino acids **tyrosine and tryptophan**.
- Plays a role in the metabolism of fats, including cholesterol.
- Required for strong **teeth and bones**.
- Required for healthy **gums**.
- Helps maintain the strength of **blood vessels**, especially capillaries.
- Facilitates **wound healing**.
- **Inhibits the formation of cancer-causing nitrosamines** in the digestive tract.
- **Strengthens immunity** by stimulating the production of antibodies and the activity of white blood cells known to engulf and destroy infected cells.
- May **reduce the severity and duration of colds**.
- **Regenerates oxidized vitamin E**. May reduce requirements for other nutrients.
- Has **antihistamine** properties.
- Required to **convert folic acid (a B-vitamin) to its active form**.
- Essential for **normal protein metabolism**.
- May **aid the detoxification of drugs**.

## VITAMIN C IS A POWERFUL WATER-SOLUBLE ANTIOXIDANT — AND MORE!

If your diet is short on vitamin C, every cell in your body suffers. As most of our body weight is water and vitamin C resides in watery regions of the body, vitamin C has a large



area to protect. It also helps regenerate our major *fat*-soluble antioxidant, vitamin E.

Antioxidants, such as vitamin C, help prevent oxidative damage. Metabolism involves an oxidative process which may create free radicals, reactive and destructive molecules with the potential to damage cells and increase the risk of disease. Other agents which contain or generate free radicals include: sunlight, radiation, cigarette smoke, smog, heavy metals, ozone, organic solvents, pesticides, herbicides, food additives, and many drugs.

Antioxidants may neutralize, or “mop up,” free radicals before they cause damage. They can also stop oxidative chain reactions, inhibiting further damage even after oxidation has begun. Though antioxidants destroy free radicals, they can be destroyed in the process, so they must constantly be replenished. As long as the body has abundant antioxidants, free radicals are held in check. If the body’s antioxidant defense team becomes overwhelmed, however, free radicals may harm and even destroy cells.

## VITAMIN C AND IMMUNITY

Why does one person exposed to an illness become sick, while another remains well? The strength of the immune system may make the difference, and vitamin C is an important member of a team of nutrients — including carotenoids, flavonoids, vitamin E, and a number of minerals — that bolster our resistance to disease. Vitamin C may boost the production of infection-fighting white blood cells and antibodies.<sup>1,2</sup> The immune system tends to respond more rapidly when cells are saturated with vitamin C. During an illness, vitamin C stores become depleted and even a well-balanced diet may not supply enough for optimal body function. Several studies indicate that vitamin C may help control viral infections causing polio, cold sores, fever blisters, shingles, pneumonia, hepatitis, measles, viral encephalitis, and influenza.<sup>3</sup> And while vitamin C may not prevent you from catching the common cold, it may reduce the length of a cold by about a day and the severity of symptoms such as coughing, fever, chills, runny nose, and sore throat.<sup>4</sup>

## VITAMIN C AND CANCER

Cancer is a group of about 100 diseases with numerous causes, including unlucky genes. *External* influences — including tobacco, chronic infections, and a poor diet — account for three-quarters of all cancers. Although a poor diet may raise your cancer risk, a good diet may lower it. Fruits and vegetables are loaded with vitamin C and other healthful nutrients, and more than 130 scientific studies document their anti-cancer effects.<sup>5</sup> The American Cancer Society recommends eating plenty of vitamin C-rich foods every day. Population studies consistently show that a vitamin C-rich diet lowers your cancer risk. *Low intakes of vitamin C are associated with a two-fold increase in the risk of cancers of the breast, cervix, esophagus, lung, mouth, pancreas, rectum, colon, and stomach.*<sup>5,6,7,8</sup>

## VITAMIN C AND HEART HEALTH

Vitamin C may help protect heart and blood vessel health. Vitamin C deficiency is a risk factor for coronary heart disease.<sup>9</sup> In a recent study, *men who were deficient in vitamin C were three times more likely to have a heart attack* compared to men who were not deficient in vitamin C. Also, *a good vitamin C status may cut your risk of a stroke in half.* Higher-than-RDA intakes of vitamin C have been linked to lower risks of cardiovascular death and disease,<sup>10</sup> as well as increases in artery-clearing HDL (“good”) cholesterol,<sup>11</sup> and decreases in artery-clogging oxidized LDL (“bad”) cholesterol<sup>10</sup> and blood pressure.<sup>11</sup>

## VITAMIN C AND LUNG HEALTH

**Smoking.** As oxidants in cigarette smoke can deplete vitamin C, smokers tend to have lower blood levels of vitamin C than nonsmokers. The U.S. National Academy of Sciences recommends almost twice as much vitamin C for smokers as for nonsmokers.

**Asthma.** Vitamin C has antihistamine effects, and in half a dozen small studies, it improved respiratory measurements of people with asthma.<sup>12</sup> In one study, it helped prevent exercise-induced asthma.<sup>13</sup>

## VITAMIN C AND PROTECTION OF THE EYE

Long-term exposure to sunlight is a risk factor for cataracts, the world’s leading cause of blindness. Free radicals in sunlight may cause proteins in the eye’s lens to break down, clump together, and cloud the lens. Vitamin C is 20 times more concentrated in lens tissue than in blood.<sup>14</sup> According to a Harvard study of more than 120,000 nurses, vitamin C supplements and an antioxidant-rich diet may help lower the risk of cataracts: Women who had taken vitamin C supplements for at least 10 years had a 45% lower risk of cataracts.<sup>15</sup> *People who consume less than 125 mg per day of vitamin C have four times the risk of developing cataracts* compared to those consuming more than 500 mg per day.

## VITAMIN C AND EXERCISE

Can vitamin C help you get more out of your workout? Suboptimal intake may contribute to muscular weakness, decreased use of fatty acids, anemia, poor healing of injuries, decreased aerobic power, muscle and nerve fatigue, and accumulation of lactic acid.<sup>16,17</sup> Vitamin C may improve oxygen utilization, acclimatization to heat, work capacity, and recovery after exertion.<sup>18,19,20</sup> While exercise may generate harmful free radicals,<sup>21</sup> vitamin C, through its antioxidant action, may lessen their damage. In one study, oxidative stress was higher in exercisers who did not supplement with vitamin C than in those who did.<sup>22</sup>

## VITAMIN C AND STRESS

Vitamin C is especially concentrated in the adrenal glands, which produce hormones in response to all types of stress: physical, mental, and emotional. The normally high levels of vitamin C in the adrenal glands are depleted when stress



hormones are made. Scientists theorize that vitamin C is needed for the synthesis or release of these hormones. The greater the stress, the greater the vitamin C requirement.

## VITAMIN C AND PREGNANCY

Pregnancy increases the need for most nutrients, including vitamin C. The placenta transmits vitamin C from mother to baby, and at birth the baby's vitamin C levels are *twice* that of the mother. For this reason, pregnant women need additional vitamin C, especially in the second and third trimesters. Also, nursing mothers lose 25–45 mg of vitamin C each day<sup>23</sup>, as human milk is rich in vitamin C.

## VITAMIN C AND LONGEVITY

Data from the First National Health and Nutrition Examination Survey (NHANES I) showed that people who frequently ate fruits and vegetables rich in vitamin C had a lower risk of dying from all causes, including cardiovascular disease and cancer.<sup>24</sup>

## HOW MUCH VITAMIN C DO I NEED?

As more and more research demonstrates substantive health benefits for greater-than-RDA amounts of vitamin C, many people are asking “How much vitamin C do I need?” Prominent researchers often recommend daily intakes which are much higher than the U.S. RDA of 60 mg (100 mg for smokers), which was designed to prevent the appearance of deficiency symptoms in healthy people. Dr. Linus Pauling, for instance, took 5,000 to 18,000 mg of vitamin C daily — that's up to 300 times the RDA! While the RDA may be on the low side, and Pauling's intake on the high side, an amount in between may be best.

**Beyond the RDA.** Researchers theorize that the daily vitamin C intake of our ancestors (more than 400 mg) was much higher than our current intake. Body stores of vitamin C are 1.5 to 2 grams. While humans cannot make vitamin C, animals that can biosynthesize it make the human equivalent of 1 to 10 grams daily, indicating that the optimal intake for humans may be higher than the RDA. So while the current RDA may be high enough to prevent scurvy, it may be too low to address other basic health needs.

**Optimal daily intake.** A review of the scientific literature shows that populations with long-term higher-than-RDA intakes of vitamin C from foods and/or supplements have reduced disease risks. Several researchers have recently suggested raising the RDA to 200 mg, an amount easily obtainable from fruits and vegetables. While this increase may be conservative, it is better than the current RDA. Many of the world's leading nutritionists take between **500–1,500 mg** of vitamin C each day in their personal health programs. *These are the levels that seem to offer the most benefits, according to recent research.*

**Above-average needs.** Many factors — smoking, caffeine, stress, chronic disease, diabetes, etc. — may create above-average vitamin C needs. And certain populations — nursing mothers, children, the elderly, those at risk for cardiovascular disease, etc. — may have above-average vitamin C needs. As tobacco smoke depletes tissues of vitamin C,<sup>25</sup> **0.5 to 2 grams of**

## FOOD SOURCES OF VITAMIN C

Food	Vitamin C (mg)
acerola cherries (1 ounce)	501
rose hips (1 ounce)	441
kiwi fruit (2)	145
orange juice (1 cup)	105
papaya (1 cup)	87
strawberries (1 cup)	83
orange (1 medium)	82
broccoli (1 cup)	79
grapefruit juice, canned (1 cup)	76
green or red pepper (1/2)	76
vegetable juice cocktail (1 cup)	67
broccoli, cooked (1/2 cup)	63
apple or grape juice, fortified (1 cup)	60
cantaloupe (1/4)	57
Brussels sprouts, cooked (1/2 cup)	53
grapefruit (1/2)	53
lemon (1)	53
tangerines (2)	52
snow peas (1/2 cup)	51
cauliflower, cooked (2/3 cup)	47
tomato juice (1 cup)	44
cabbage, shredded (1 cup)	40
mango (1 cup)	39
lime (1 medium)	37
kale, cooked (2/3 cup)	35
raspberries (1 cup)	35
honeydew (1/10)	33
sweet potato, baked (1)	32
pineapple juice, canned (1 cup)	27
watermelon (2 cups)	27
spinach, raw (1 _ cups)	24
pineapple (1 cup)	22
lettuce, romaine (1 _ cups)	20
parsley (1/4 cup)	20
potato, baked, with skin (1)	19
radishes (7)	19
blueberries (1 cup)	18
tomato (1/2 cup)	16
tomato sauce (1/2 cup)	16

Sources: USDA Handbook 8, Florida Department of Citrus, Center for Science in the Public Interest, Refs. 26, 27.

**Vitamin C daily** is recommended for smokers. Others with above-average vitamin C needs may include people who: live or work with smokers, skip meals, take certain medications, suffer from allergies or illnesses, sustain regular bruises or minor injuries, eat few fruits and vegetables, or are exposed to pollution or toxic substances. Vitamin C is safe even in high doses. While higher-than-RDA intakes are supported by scientific findings,



indiscriminate use of vitamin C is not. Massive doses of vitamin C may be hazardous to those prone to iron storage disease.

## READILY AVAILABLE, BUT OFTEN MISSED

Even though vitamin C is readily available in foods, most people do not get enough. Some of the richest natural sources of vitamin C are acerola cherries and rose hips (the base of the rose bloom). Citrus fruits — oranges, grapefruit, lemons, and limes — are also excellent sources. Other top sources are strawberries and other berries, pineapple, guavas, papayas, cantaloupe, peppers, broccoli, green leafy vegetables, and tomatoes.

## DEFICIENCY IS ALWAYS A RISK: THE VITAMIN C “GAP”

Humans are one of the few species that cannot make vitamin C. All animals require vitamin C, however, so those whose bodies cannot biosynthesize it must obtain a steady supply in the diet. But vitamin C is water-soluble and is therefore impossible to store for long periods. Compounding this problem is the fact that vitamin C, a fragile nutrient that is easily oxidized and attacked by enzymes, can be destroyed in significant amounts during food harvesting, transportation, storage, processing, and cooking. The vitamin C in fresh green beans, for instance, can deteriorate 50% in the week between harvest and purchase. The bottom line? Your diet may not be meeting your vitamin C needs.

Do you get enough vitamin C? That depends if your primary goal is 1) to prevent deficiency symptoms or 2) to hinder oxidation, lessen free-radical damage, and promote optimal health. Most of us do not get the amount of vitamin C we need each day to prevent even minor deficiency. And if we're not getting enough vitamin C to meet goal number one, we're certainly not getting enough to meet goal number two. Consider:

- 59% of Americans do not consume the RDA for vitamin C. That's not very encouraging considering it only takes one orange a day to get this amount!
- Intake of fruits and vegetables — the richest vitamin C sources — is down: Nearly half of all Americans eat NO fruit and one-quarter eat NO vegetables on any given day.<sup>28</sup>

## THE GNLD DIFFERENCE IN VITAMIN C SUPPLEMENTATION

GNLD provides three excellent choices to help you address the vitamin C “gap” and assure that your dietary needs are being met: **Super C** for sustained release over six hours, **Powdered C** to boost the vitamin C content of foods and beverages, and delicious **All-C** for a chewable option. All our products feature high-potency, high purity vitamin C plus vitamin C-related factors from oranges, lemons, and grapefruit. All-C and Powdered C also contain rose hips and acerola cherries — nature's richest vitamin C sources!

## GNLD DIFFERENCE #1: WHOLE-FOOD SOURCES

In nature, vitamin C does not exist in isolation. It exists in

fruits and vegetables with bioflavonoids, proteins, carbohydrates, and other factors which work together to improve vitamin C's bioavailability. All GNLD vitamin C supplements feature our exclusive whole-citrus **Neo-Plex Concentrate** with juice, vitamin C, flavedo, mesocarp, endocarp, protopectins, bioflavonoids, and other natural factors — virtually everything from whole oranges except the water! By providing vitamin C in a natural, biocompatible context, Neo-Plex Concentrate helps your body better absorb and utilize vitamin C.

Flavonoids — potent antioxidants in their own right — improve bioavailability of vitamin C but are typically removed from fruit juices because of their bitter taste. A landmark study published in the *American Journal of Clinical Nutrition* showed that vitamin C from a citrus extract — which included flavonoids naturally present in fruit — was absorbed 35% better than synthetic vitamin C.<sup>29</sup> Our vitamin C formulas contain **high-potency, high-purity vitamin C** as well as related factors such as **lemon bioflavonoid complex**, **hesperidin** (a flavonoid from grapefruit), and **rutin** (a flavonoid from buckwheat) for maximum biocompatibility. Lemon-flavored Powdered C and chewable All-C also contain flavonoids from **rose hips** and **acerola cherries**.

## GNLD DIFFERENCE #2: GUARANTEED POTENCY

Because vitamin C is so fragile, we manufacture our products with 10-20% more vitamin C than claimed by the label to assure full potency throughout the guaranteed shelf life.

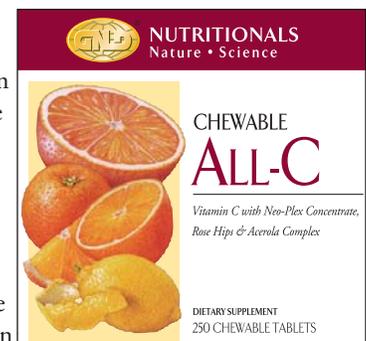
## GNLD DIFFERENCE #3: A VARIETY OF SUPPLEMENTATION OPTIONS

GNLD brings you the powerful antioxidant protection of vitamin C in three great formulas: cherry-flavored chewable tablets, Threshold Controlled tablets, and a lemon-flavored powder. Each product offers a different potency level, so you can choose the product that best meets your needs or combine products to meet higher vitamin C goals.

## CHEWABLE ALL-C

Delicious cherry-flavored All-C is great for children or anyone who prefers chewable tablets. You can take them throughout the day to maintain high vitamin C levels, or take a tablet whenever you want the vitamin C value of 4 small oranges.

- **Chewable with great cherry taste.**
- **Potent** — Each tablet provides the vitamin C value equivalent to 4 small oranges.
- **Neo-Plex Concentrate.** Virtually everything from whole oranges except the water — juice, vitamin C, flavedo, mesocarp, endocarp, protopectins, bioflavonoids, and other naturally-occurring factors — to enhance the absorption and utilization of vitamin C.

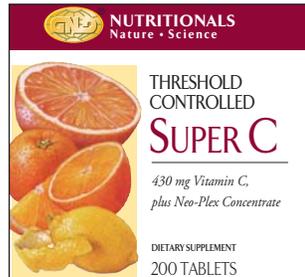




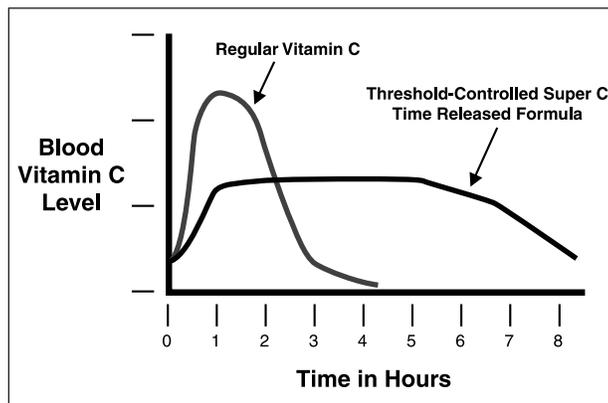
- **Other whole-food bioflavonoids.** Rutin from buckwheat, hesperidin from grapefruit, and bioflavonoid complex from lemon.
- **Rose hips and acerola cherries** provide additional natural vitamin C and flavonoids.
- **Two convenient sizes.** Available in counts of 90 or 250 tablets; keep a jar handy for delicious vitamin C anytime.

## THRESHOLD CONTROLLED SUPER C

Technologically-advanced Threshold-Controlled Super C allows sustained release of vitamin C for six hours or more. Super C supplies more vitamin C than 8 small oranges in a convenient, easy-to-swallow tablet.



- **Exclusive Threshold Control formulation from the GNLD Scientific Advisory Board** maintains sustained release of nutrients for six hours or more.
- **High potency.** 430 mg of vitamin C per tablet.
- **Neo-Plex Concentrate.** Virtually everything from whole oranges except the water — juice, vitamin C, flavedo, mesocarp, endocarp, protopectins, bioflavonoids, and other naturally-occurring factors — to enhance the absorption and utilization of vitamin C.
- **Other whole-food bioflavonoids.** Rutin from buckwheat, hesperidin from grapefruit, and bioflavonoid complex from lemon.



Like all water-soluble vitamins, vitamin C moves quickly through the body. Vitamin C levels in the blood usually 'peak' within two hours of ingestion, then fall rapidly. One advantage of sustained-release technology is that it extends peak vitamin C blood levels from less than two hours to more than six hours.

<http://www.GNLD-NeoLife.com>



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