

# VITAMIN-C



## CLINICAL APPLICATIONS

- Promotes Healthy Collagen Formation to Maintain Healthy Blood Vessels
- Supports Connective Tissues
- Maintains Normal Inflammatory Balance
- Boosts Immune System Function

## ESSENTIAL VITAMINS

Vita-C is a formula that combines vitamin C with various bioflavonoids to mirror the way vitamin C is found in nature. Created from multiple sources rich in vitamin C, Vita-C enhances immune function and provides support for healthy collagen synthesis and connective tissue. It also supports normal levels of inflammation throughout the body. Vita-C provides 400 mg vitamin C, 100 mg acerola extract, 70 mg quercetin, 50 mg hesperidin, 50 mg hibiscus and 50 mg rutin in an easy-to-take capsule form.

### Overview

While most mammals can synthesize vitamin C, humans lack the enzyme required to synthesize vitamin C from glucose and, must obtain the vitamin from their diet. The primary function of vitamin C is to help manufacture collagen, the main structural protein of connective tissues in the human body. Still, vitamin C is crucial in variety of biological functions, particularly the immune system, skin, blood vessels, arteries and gums. It is an important antioxidant, providing protection from free radicals and the oxidative stress resulting from normal cellular function. In addition, vitamin C is important in brain health, where it supports neurotransmitter (brain chemical) synthesis, normal stress hormone production and serves as a cofactor for several metabolic enzymes, including hydroxylation reactions that are essential for collagen formation.<sup>1-4</sup>

### Depletion<sup>†</sup>

While true deficiency in vitamin C is rare (the most severe form of deficiency is known as scurvy), evidence suggests that many people may have low levels of vitamin C, especially

those under high amounts of stress and low dietary fruit and vegetable intake. Signs of deficiency include dry and splitting hair, bleeding gums, dry or scaly skin and easy bruising. Those taking NSAIDS, aluminum-based antacids, oral contraceptives, barbiturates, tetracycline and Coumadin are more susceptible to depletion of vitamin C.<sup>5</sup>

### Immune Support<sup>†</sup>

Vitamin C has long been recognized for its role in supporting the immune system, specifically T cells, which absorb and concentrate vitamin C.<sup>2,6,7</sup> A randomized, double-blind, placebo-controlled study (1,000 subjects taking 1,000 mg of vitamin C per day) revealed that the group given vitamin C could consistently maintain a healthy immune response.<sup>8</sup> Supplementation with vitamin C has also been shown to support immune response to seasonal challenges by supporting natural killer cells, lymphocyte proliferation, chemotaxis and delayed-type hypersensitivity.<sup>9</sup>

### Inflammatory Balance<sup>†</sup>

Vitamin C plays a key role in maintaining normal inflammatory balance. In a randomized crossover study (20 subjects, aged 21-29 years, who randomly consumed two glasses (250 mL each) of either a vitamin C-rich apple juice or a polyphenol-rich juice), numerous cardiometabolic markers were found to be maintained in the healthy range, as was antioxidant status.<sup>10</sup> Supplementation with vitamin C has been shown to support microbial balance in the gastric mucosa by promoting an environment where healthy microflora can thrive, increase tissue antioxidant status and enhance the absorption of key

<sup>†</sup> These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.

nutrients.<sup>11</sup> High-dose vitamin C has also been shown to balance cytokines and help maintain healthy C-reactive protein levels in 75% of patients assessed.<sup>12</sup> A cross-sectional study of lean and obese men aged 21± for three years found that higher vitamin C status was associated with better maintenance of normal inflammatory balance and blood vessel health.<sup>13</sup>

### Bioflavonoids†

Bioflavonoids are a group of plant pigments that provide the colors of many fruits and flowers. Flavonoid intake is associated with cardiovascular health and microbial balance.<sup>[14,15]</sup> Bioflavonoids are used to support connective tissue and joint comfort,<sup>16,17,18</sup> as well as respiratory and eye health. Citrus bioflavonoids have also been shown to cross the blood-brain barrier, impart neuroprotective effects<sup>19</sup> and promote healthy cell growth, detoxification enzymes, vasodilation and healthy platelet function.<sup>20</sup> Quercetin, a flavonoid found in a variety of herbs, vegetables and fruits, is an antioxidant that inhibits inducible ICAM-1 expression, an important pathway for maintaining normal inflammatory balance.<sup>21</sup> It has also been shown to support epithelial barrier function in the intestines,<sup>22</sup> to stabilize mast cells by releasing cytoprotective factors and to promote the balanced release of inflammatory mediators from mast cells.<sup>23</sup> Rutin and hesperidin complex are strong antioxidants, which increase intracellular levels of vitamin C and offer similar benefits to quercetin.

### Directions

1 or more capsules per day or as recommended by your health care professional.

### Does Not Contain

Gluten, corn, yeast, artificial colors and flavors.

### Cautions

If you are pregnant or nursing, consult your physician before taking this product.

## Supplement Facts<sup>v1</sup>

Serving Size 1 Capsule  
Servings Per Container 60

1 capsule contains	Amount Per Serving	% Daily Value
Vitamin C (as Ascorbic Acid USP, Acerola Fruit)	400 mg	444%
Acerola Fruit (Standardized to contain 17% Vitamin C)	100 mg	*
Quercetin Dihydrate	70 mg	*
Hesperidin Complex	50 mg	*
Hibiscus Flowers	50 mg	*
Rutin	50 mg	*

\* Daily Value not established

ID# 111060 60 Capsules

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