

## Phytonutrients—Antioxidants

Many phytonutrients found in fruits and vegetables have antioxidant properties that boosts our immune system and cell functions promoting good health.

### *What are antioxidants and how do they protect us?*



- They are powerful, protective chemical substances found in fruits and vegetables, marine plants and some seafood that eat marine plants.
- They are naturally occurring or man-made that protect against the oxidation process.
- The oxidation process, which forms free radicals, occurs naturally within the body. But under stressful conditions such as pollution, smoking, inflammation and other situation, can produce an overabundance of free radicals. Free radicals are unstable, unpaired electrons that seek to stabilize by taking or picking up electrons from other molecules. This process can create a chain reaction of stable molecules becoming free radicals resulting in a high concentration of free radicals damaging the DNA,

cell structures or protein. Research indicates that the damages produced from oxidation are linked to certain diseases such as cancer, heart disease, diabetes, autoimmune diseases, and arthritis, to name just a few.

- Antioxidants have the ability to donate electrons to stabilize the free radicals without becoming free radicals themselves.

### *How much should one consume?*

- There is growing evidence from research that there are health benefits from consuming a mixture of colorful vegetables and fruits which provide a variety of nutrients and phytochemicals working together instead of taking isolated nutrients. The U.S. government recommends a varied diet with at least five servings of fruits and vegetables per day and 6-11 servings of grains per day, with at least three of those being whole grains.

### Common antioxidants found in fruits and vegetables:

Caretenoids:	Possible Health Benefits:	Color and Food Source:
Beta-carotene, Lutein, Lycopene	precursor to Vitamin A; may boosts immune system; eye health benefit, may lower cancer risk; may prevent heart disease	orange/yellow/green pigmentation; cantaloupes, pink grapefruit, apricots, oranges, carrots, pumpkin, sweet potatoes, winter squash, broccoli, kale, spinach, kiwi, Brussels sprout, tomatoes and most dark green, leafy vegetables
Vitamin A	bone development, may boost immune system, vision, reproduction, cell functions	kale, liver, dairy products, and fish
Vitamin C	skin, bones and connective tissue	citrus, green and red pepper, tomatoes, broccoli, and greens
Vitamin E	immune system and metabolic process	nuts and seeds, vegetable oil, and leafy greens

Flavanoids:	Possible Health Benefits:	Color and Food Source:
Anthocyanidins, Flavanols, Isoflavones, Flavonols	may help keep blood vessels healthy, may inhibit the destruction of collagen, may promote heart health, may reduce cholesterol, and may boost immune system	deep blue, purple pigmentation found in berries, grapes, green tea, black tea, cocoa (dark chocolate), apples, broccoli, soy, legumes, nuts, yellow onions, kale, apples, berries, teas and red wine