

WHFoods: How Can I Eat to Optimize My Genetic Potential for Good Health?

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Discussion

The latest research, building on the results of the Human Genome Project, is showing that virtually all the chronic degenerative diseases-the cardiovascular diseases, type 2 diabetes, arthritis, digestive disorders, loss of mental function, and even many cancers-are the result of dietary, lifestyle and environmental choices we make that do not provide for our genetically inherited needs.

We're learning that-with the exception of a few traits like eye color and an increased potential risk for some diseases-our genetic inheritance or genotype holds not just one, but a variety of options for what will be expressed and appear as our phenotype, our actual physical self.

And we're learning that which genetic options are chosen is affected by the foods we eat, that the foods we consume actually "talk" to our genes, delivering information that changes which aspects of our genes-those that promote health or those that engender dysfunction and disease-will be activated.

Scientists have learned that even the genes we've inherited that render us more susceptible to various chronic diseases do not, inevitably, cause disease. Their damaging messages remain silent-unless we make food, lifestyle or environmental choices that trigger them into action.

While researchers are just beginning to identify which genes are highly protective and which render people more susceptible to unhealthy aging and chronic disease, the latest research already provides sufficient information to make smart choices about the foods you eat. Right now, you can choose the healthy way of eating that hundreds of studies clearly show is most likely to tell your genes to create your healthiest possible phenotype.

Choose Fruits, Vegetables, Whole Grains, Nuts and Seeds Rich in *Phytonutrients*

An explosion of recent research has begun to reveal the immense effects that phytonutrients, the thousands of protective compounds in plants (*phyto* means *plant*), have on our health.

Fruits, vegetables, whole grains, nuts and seeds contain *a lot* more than carbohydrate, protein, fat, fiber, vitamins and minerals. Each and every type of plant is loaded with phytonutrients.

Why do plants expend so much of their vital energies creating all these protective compounds? As Sesame Street's Kermit so aptly noted, "It's not easy being green!" Few plants reside in hothouses where they are guarded from assault not merely by pests, but excessive heat, UV exposure, dryness, flooding, hail, snow, sleet, ice-you get the picture. To not merely survive all this, but flourish-a feat which plants have definitely achieved-they need serious protection. Phytonutrients provide it. They're plants' version of the Environmental Protection Agency, National Guard, Police, Fire Fighters, and Emergency Medical Technicians, all rolled into one.

Since not only do environmental conditions vary dramatically throughout the year even in the same locale, but different plants have different requirements for optimal growth, the variety of phytonutrients plants produce is staggering. We already know about hundreds of them and are continually discovering new ones, along with additional ways in which they work together to support human physiology.

Phytonutrients in fruits, vegetables, whole grains, legumes, nuts and seeds-like flavonoids, catechins, phenols, anthocyanins, isothiocyanates, carotenoids, terpenoids and a legion of other chemicals with tongue-twisting names-modify gene expression, each promoting healthy physiological function in a slightly different way, *when consumed*.

And for many of us, that's the catch. To get the myriad benefits that occur when phytonutrients "talk" to our genes, we have to ingest them, and that means eating lots of *whole, unprocessed, organically grown* fruits, vegetables, nuts, seeds and whole grains: **Whole:** because many phytonutrients hang out in or immediately under a plant's skin (or in the case of grains, in the outer, fibrous layer), preventing damage to the periphery and fortifying the borders against invaders. Processing often removes and discards this phytonutrient-rich outermost layer of plant foods.

Take apples as an example. Apple peels contain anywhere from two to six times (depending on the variety) more phenolic compounds and two to three times more flavonoids in their peels than their flesh. Not surprisingly, in lab studies, the antioxidant activity of apple peels is much greater, ranging from two to six times greater in the peels than the flesh, depending on the variety of apple.

Or look at what happens when whole wheat is processed into refined wheat flour. Refined wheat flour is made from the starchy endosperm of the wheat kernel, discarding both its bran and germ. Unfortunately, the bran and germ are where virtually all wheat's phytonutrients live. The bran and germ, which are retained in whole wheat flour, contain 83% of wheat's total phenolic content, 79% of its flavonoids, 51% of its lutein, 78% of its zeaxanthin, 42% of its beta-cryptoxanthin, 85% of its water-soluble antioxidant activity, and 94% of its total fat-soluble antioxidant activity. **Unprocessed:** because some phytonutrients are volatile and evaporate when exposed to heat, light and air. Others spring into action when a plant's surface is cut, expending their protective energies over the next several hours or days-long before a processed food gets shipped to market, bought and brought home to be part of your meal. **Organically grown:** because research shows that plants produce way more phytonutrients when their needs to defend themselves against pests are not being covered by pesticides. Also because when plant foods are conventionally grown, the pesticides and other potentially harmful agricultural chemicals used are typically concentrated in the skin. Removing the skin greatly lessens the amounts of these toxins we consume, but also deprives us of a significant portion of the plant's phytochemicals.

For a glimpse into the abundance and complexity of nutrients whole foods deliver, let's look at oranges. When we think "oranges," we think "vitamin C," but as important as this antioxidant is to our health, it's the tip of an orange's nutrient iceberg.

As internationally respected nutritional biochemist, Jeff Bland, Ph.D., notes in his ground-breaking book, *Genetic Nutrioneering*, more than 170 phytochemicals have been identified in [oranges](#), including more than 60 bioflavonoids that modify gene expression to lessen inflammation, inhibit blood clot formation and activate the body's detoxification system. More than 20 carotenoids are also found in oranges, including not only beta-carotene, but lutein, zeaxanthin and cryptoxanthin, which are associated with lower incidence of age-related macular degeneration (ARMD), the leading cause of blindness in the United States after age 65.

And each fruit, vegetable, whole grain, legume, nut and seed has developed its own unique array/combination of phytonutrients for its personal defense and optimal growth. It's not surprising-given how evolution works-but still a most elegant serendipity that these phytochemicals in plant foods modify our gene expression in ways that help protect us against premature or unhealthy aging and chronic diseases.

From what we've learned so far, phytonutrients in whole foods interact with our genes to increase the expression of those that encode for the production of antioxidant and detoxification enzymes, while putting to sleep those that promote inflammation and the development of cancer. In doing so, phytonutrients turn up a profusion of protective processes in our bodies, while shutting down the damaging ones.

Here are some of the most studied phytonutrients, the foods in which they're highly concentrated, and a few of their beneficial gene-related actions. (Remember we've already discovered about 1,000 of these compounds and have just begun to explore what they do): **Allyl sulfides** [Garlic](#) and [onions](#)

Powerful antioxidants, allyl sulfides protect our genes, promote detoxification of carcinogens, lower blood pressure, and boost immune defenses. **Flavonoids** [Green tea](#), [grapes](#), [onions](#), [garlic](#), and the fleshy inner peel of citrus fruits, like [oranges](#) Flavonoids are potent antioxidants and promote the expression of anti-cancer, anti-inflammatory genes and the enzymes responsible for the second, final phase of detoxification.

Catechins are one kind of bioflavonoid highly concentrated in tea. Epigallocatechingallate (EGCG), the most active catechin found in [green tea](#), is thought

to be responsible for many of its wide-ranging anti-cancer, cardioprotective, detoxification-enhancing and immune-supportive effects.

Quercetin, another flavonoid found in [onions](#) and [garlic](#), lowers the expression of pro-inflammatory genes associated with allergy and arthritis.

Resveratrol, a flavonoid found in [grapes](#), especially their skins, and red wine, is a powerful antioxidant not only protects against free radical damage to the lining of our blood vessels, but also alters gene expression to protect against blood clot formation and heart disease.

Anthocyanins, another type of flavonoid with powerful anti-oxidant activity, protect plants from free radicals formed by UV light and during metabolic processes. As the following table indicates, many commonly eaten foods, especially berries and dark purple fruits, but also some vegetables and even beans, are excellent sources of anthocyanins.

Common U.S. Foods Highest in Anthocyanins

Food	Anthocyanins in 100 grams (1 cup)
Marion Blackberries	433 mg
Blackberries	353 mg
Blueberries, cultivated	529 mg
Blueberries, wild	705 mg
Black currant	533 mg
Elderberry	1993 mg
Chokeberry	2147 mg
Sweet cherry	177 mg
Cranberry	133 mg
Concord grape	192 mg
Black plum	82.2 mg
Plum	12.5 mg
Black raspberry	845 mg
Red raspberry	116 mg
Strawberry	69.2 mg
Red cabbage	113 mg
Red radish	116 mg
Eggplant	35 mg
Red onion	38.8 mg

Black bean, raw*

23.1 mg

* Beans are not eaten raw, but only after cooking. Since anthocyanins leach into cooking water or canning brine, only 50-70% of them are likely to be retained in cooked beans.

Curcumin The yellow pigment in the spice, [turmeric](#)

Yet another formidable antioxidant, curcumin protects our genes, reduces expression of pro-inflammatory genes, and switches on anti-inflammatory genes. **Ellagic acid**
[Walnuts, strawberries, cranberries, raspberries, grapes](#)

A phenolic acid with potent antioxidant activity that also helps maintain levels and promotes production of antioxidant enzymes, ellagic acid also induces apoptosis (suicide) in tumor cells. **Glucarates** [Oranges, apples, grapefruit](#), cruciferous vegetables, such as [broccoli](#)

Improve detoxification by inhibiting beta-glucuronidase, an enzyme that helps recirculate potential carcinogens, particularly those involved in breast, prostate, and colon cancers. **Glucosinolates** (indole-3-carbinol, isothiocyanates, sulforaphane)
Crucifers: [Broccoli, cauliflower, cabbage, Swiss chard, mustard greens, collards, kale](#)

Promote expression of detoxification and antioxidant enzymes and lessen inflammation by turning off genes that produce NF-kappaB, a compound central to the inflammatory process. **Gingerols** [Ginger](#)

Work with curcumin to silence pro-inflammatory genes, also prevent inflammation by inhibiting enzymes involved in the production of inflammatory compounds (PG synthetase, which produces inflammatory prostaglandins, and arachidonate 5-lipoxygenase, which is involved in leukotriene synthesis). Inhibit platelet activation, thus preventing blood clots. Protect against ulcers, gastric and colon cancer by inhibiting the growth of *H.pylori*. **Isoflavones** (genistein and daidzein) [Soybeans](#)

Improve detoxification and normalize activity of estrogen/testosterone. Multiple beneficial effects through a variety of mechanisms on breast and prostate cancers, menopausal symptoms, osteoporosis, atherosclerosis and stroke, and brain cell deterioration. **Isothiocyanates** (sulforaphane, I3C, DIM) Cruciferous vegetables: [Broccoli, cauliflower, cabbage, Swiss chard, mustard greens, collards, kale](#)

Stimulate production and balance activity of detoxification enzymes. The liver clears out

toxins in a two step process. In the first step, Phase I, the cytochrome p450 family of enzymes dismantles some toxins and converts others into even more dangerous compounds that then attract the Phase II enzymes, which render them ready for elimination from the body. If Phase I is too active, the more dangerous compounds it creates can stockpile. The isothiocyanates in cruciferous vegetables promote an even flow through our detoxification system by inhibiting the Phase I (cytochrome P450) enzymes, while stimulating the activity of Phase II enzymes.

Isothiocyanates help protect our genes from damage by carcinogens. In cells that have become cancerous, isothiocyanates block cell replication and trigger apoptosis (suicide) by damaging the mitochondria (energy production factories) in these cells, causing them to literally run out of energy and collapse. **Lignans** [Flaxseeds](#) and [soybeans](#)

Bind to estrogen-receptors on cells and normalize metabolism of estrogen/testosterone.

Protect the liver by preventing a decrease in levels of liver antioxidant enzymes.

Inhibit the production of a variety of compounds involved in cellular inflammation processes, angiogenesis (in cancer, an excessive development of new blood vessels) and blood clot formation.

Protect the cardiovascular system by decreasing oxidative (free radical) stress, lowering total cholesterol and LDL (bad) cholesterol levels, and increasing levels of (good) HDL cholesterol.

Inhibit proliferation of hormone-sensitive tumor cells, e.g., cancerous breast and prostate cells. **Phytosterols** [Soybeans](#) and other legumes

Cause beneficial alterations in both cholesterol metabolism and inflammatory pathways.

Reduce absorption of cholesterol from foods. Decrease the production of cholesterol esters by human liver cells and chylomicrons by intestinal cells. (Chylomicrons are small globules composed of a protein plus a fat molecule, Made by the cells lining the intestine, they are secreted after a fat-containing meal to carry fat to the liver, where it is then used to produce cholesterol.) Lower total cholesterol, (bad) LDL cholesterol, raise (good) HDL cholesterol, and lower triglycerides.

Decrease inflammation by promoting production of anti-inflammatory interleukin (IL)-10, while also lowering production of lower two pro-inflammatory compounds, cytokine

(IL)-6 and TNF-alpha.

What should I eat to send healthy messages to my genes?

While the evidence is complex, the conclusion it all points towards is simple: **A Mediterranean-style diet is the best way we can choose to send our genes the messages that will produce our optimal health.**

This healthy way of eating-which *easily* delivers between **5-10 daily servings of fruits and vegetables along with whole grains, nuts, cold-water fish rich in omega-3 fats, and the healthy fats found in olive and flaxseed oils**-is absolutely loaded with hundreds of phytonutrients.

Research uncovering the multitude of ways in which phytonutrients talk to our genes is now beginning to explain the many epidemiological studies that link a Mediterranean-style diet to healthy aging, protection from and/or treatment for all the major age-related chronic diseases, including heart disease, high blood pressure, diabetes and cancer.

How to Eat for Youthful Aging

"Most of the characteristics that determine health and vitality after mid-life are related to the inducible or modifiable genetic factors and not the hard-wired or constitutional factors. In fact, gerontologists now state that 75 percent of an individual's health after age 40 is dependent upon what the person has done to his or her genes, not the genes themselves," notes Dr. Bland, a man who has obviously induced the right genes since, at age 60, he has twice the energy of men half his age.

So, which genetic factors does Dr. Bland recommend we induce and what foods should we eat to do so?

In fruit flies, the rate at which cells age is directly related to how well those cells can protect themselves against free radical damage. According to this free radical theory of aging, which applies to us as well, the less exposure to free radicals and the more antioxidant protection a cell has, the longer its youthful lifespan.

So, for youthful aging, we need to avoid unnecessary exposure to free radicals and keep our cells well supplied with antioxidants, both by consuming them ready-made in the foods we eat and by inducing those genes that maximize our own internal production of

antioxidants.

In addition to familiar antioxidants in foods, such as vitamins E, C and beta-carotene, our cells rely for protection on a number of very powerful antioxidant enzymes, including superoxide dismutase, glutathione peroxidase, and glutathione reductase, all of which are manufactured in our cells-*if* the right messages are sent to our genes by phytonutrients, especially the flavonoids.

Enjoy Lots of Flavonoid-rich Fruits, Vegetables, Legumes, and Whole Grains

One of the largest groups of phytonutrients, the flavonoids (the red, blue and purple pigments in plants), includes compounds such as:

- Quercetin (onions, green tea, apples, cranberries, buckwheat, beans, such as black beans)
- Gingerol (ginger)
- Kaempferol (strawberries, cranberries, broccoli, cauliflower, Brussels sprouts, cabbage chives)
- Resveratrol (grape skins, wine, peanuts)
- Rutin (citrus fruits, like oranges, lemons, and grapefruit; buckwheat, parsley, tomato, green tea)
- Hesperidin (citrus fruits like oranges, lemons, and grapefruit)
- Catechins (green tea, grapes, apples, lentils, black-eyed peas)
- Anthocyanins (many red, purple, or blue fruits and vegetables, including blueberries, purple cabbage, eggplant)
- Isoflavones (soy, chickpeas, peanuts, and other legumes)
- Coumestans (soy, peas, Brussels sprouts)

To make sure we provide our cells with a constant supply of flavonoids, these foods should be staples in any anti-aging plan.

The following trace minerals, and thus the foods in which they are concentrated, are also necessary since they are essential components of our antioxidant enzymes:

- Zinc (crimini mushrooms, spinach, Swiss chard, pumpkin seeds and sesame seeds)
- Manganese (cloves, cinnamon, romaine lettuce, spinach, thyme, turmeric)
- Copper (crimini mushrooms, blackstrap molasses, Swiss chard, spinach, collard

and mustard greens)

- Selenium (crimini mushrooms, cod, shrimp, tuna, halibut, salmon, eggs, barley)

Choosing Foods that Talk to Your Genes to Lower Disease Risk

Cancer

In a review article published in 1992 in *Nutrition and Cancer*, 82% of 156 population studies found that a diet rich in fruits and vegetables provides significant protection against cancer. People eating the least of these phytochemical-rich foods were found to have almost double the risk of developing cancer compared to those with the highest intake of fruits and vegetables.

The National Cancer Institute has now spent well in excess of \$20 million dollars and funded more than 1,000 studies to evaluate the anticancer potential of plant foods. These studies indicate that the following foods contain phytochemicals that either trigger the expression of genes that shut down cancer cells or put oncogenes (genes that promote the development of cancer cells) to sleep.

Foods with the highest anti-cancer activity include garlic, soybeans, cabbage, ginger, licorice and the umbelliferous vegetables (including carrots, celery, cilantro, parsley, and parsnips).

Significant cancer-preventive actions have been seen in studies on onions, flaxseed, oranges, grapefruit, lemons, turmeric, broccoli, Brussels sprouts, cauliflower, tomatoes, eggplant, chili peppers, brown rice, whole wheat and barley. Oats, mint, rosemary, thyme, sage, oregano, basil, cucumber, cantaloupe and berries, including blueberries, raspberries and cranberries, have also demonstrated cancer-inhibiting effects.

Cooking to Lower Cancer Risk

In addition to enjoying these foods as a regular part of your healthy way of eating, your choice of cooking methods may also affect your cancer risk. Charbroiling meat, fish or poultry, for example, promotes the formation of a family of toxic substances called heterocyclic aromatic amines (HAAs), which can become carcinogens or impair the function of the immune and nervous systems.

A healthy detoxification system-supported by foods high in fiber along with antioxidants

and bioflavonoid phytonutrients, particularly a phenol called oleoresin found in [rosemary](#)-can help protect you against the occasional dietary indiscretion. In a study published in *Food Chemistry and Toxicology* (May 2000), when rosemary was added to beef patties before they were fried, HAA formation was reduced by 44%!

Cooking methods that expose fats to high heat greatly lessen the amount of any protective compounds the fats contain, while also producing free radicals and other potentially harmful compounds. This is why we recommend adding oil to your foods *after* cooking. You'll get all the flavor, while retaining the phytonutrients in the oil-and you won't consume harmful free radicals.

Cardiovascular Disease

The belief that cholesterol alone is the root cause of cardiovascular disease has been superseded by a deeper understanding of the complex processes that result in high blood pressure, atherosclerosis, heart attacks and strokes.

Research has revealed that chronic inflammation is highly correlated with an increased risk of heart disease. Elevated blood levels of markers of inflammation, such as homocysteine, are now well recognized as cardiovascular risk factors as, or even more important than, cholesterol.

One reason for this is that until cholesterol is damaged, which occurs when high levels of inflammatory compounds are in the bloodstream, it does not begin the process of attachment to the blood vessel wall that is a first step in the development of atherosclerosis.

Chronic low grade inflammation may be due to infection with an unfriendly organism, such as *Helicobacter pylori*, the bacterium that causes ulcers, or can be caused by eating a diet that sends unfriendly messages to our genes.

A diet high in processed, refined foods, saturated and trans fats, puts the part of our immune system found within our digestive tract-the gut-associated lymphoid tissue or GALT-into a state of alarm.

These foods-the bulk of the standard American diet-deliver messages that tell the GALT to call out the troops. Gene expression alters in the cells composing the GALT to ramp up production of inflammatory molecules called cytokines, which are sent out to prime the entire body to be ready to eliminate enemy agents.

An immune system on continuous red alert can over-react, wiping out normal tissue that its soldiers mistakenly perceive as the enemy. Such "friendly fire" casualties can lead to damage not only to cholesterol and blood vessel walls, but to joints as well.

So, what foods can we eat to lower inflammation? Are there foods that can deliver messages that help shut down *H.pylori*? Lower levels of homocysteine? Tell our blood vessels to relax? Signal the GALT it's okay to step down, kick back and take a break? Absolutely. Here are some of them and what they do.

Foods that Fight *Helicobacter Pylori*

Broccoli sprouts

If your digestive system is frequently upset, your stomach may be reacting to an unwelcome guest: *Helicobacter pylori*. Infection with *H. pylori* is very common worldwide. Some experts estimate that nearly 50% of the American public harbor the bacterium.

Regularly eating broccoli sprouts-100 grams (3 ounces) a day-can significantly reduce *H. pylori* infection, confirms two studies that follow several years of laboratory research on the sprouts, one published in an early 2005 issue of *Inflammopharmacology* and another in the November 2005 issue of the Japanese medical journal, *Nippon Rinsho*.

Broccoli sprouts' ability to inhibit *H.pylori* is thought to be due to their especially rich concentration of glucoraphanin, the precursor of sulforaphane, which is highly protective against free radicals that can increase inflammation, damage DNA, and potentially cause not just ulcers, but stomach cancer.

Sulforaphane is made in our bodies from glucoraphanin, the key protective compound in broccoli. Glucoraphanin is at least 20 times more concentrated in 3-day-old broccoli sprouts than in mature broccoli. *H.pylori* infection produces a constant barrage of free radical damage to the cells that make up the lining of the stomach. To survive, these cells must be able to increase their arsenal of antioxidant enzymes to protect themselves from DNA damage.

The research published in *Inflammopharmacology* revealed that the gene that encodes Nrf-2 (NF-E2 p45-related factor-2) plays an important role in increasing the production

of these protective enzymes. Sulforaphane stimulates this nrf-2 gene-dependent production of antioxidant enzymes, thereby guarding cells against oxidative injury during *H. pylori* infection.

For the study published in *Nippon Rinsho*, researchers recruited 40 patients infected with *H. pylori*. Twenty patients ate broccoli sprouts; the other 20 ate alfalfa sprouts. After two-months, in those who ate 100 grams (3 ounces) of broccoli sprouts per day, both *H. pylori* and pepsinogen (an indicator of damage to the stomach) markedly decreased. Those eating alfalfa sprouts showed no benefit. [Ginger](#)

Ginger has a long history of use in the treatment of gastrointestinal ailments like indigestion, motion sickness and nausea during pregnancy. Since the bacterium, *H. pylori*, is now recognized as a primary contributing factor to not only indigestion, but peptic ulcers, and gastric and colon cancer, researchers decided to see if ginger had any effect on *H. pylori*. Ginger absolutely trounced the bacterium.

In this research, published in the September-October 2003 issue of *Anticancer Research*, 19 different strains of *H. pylori* went head-to-head with ginger. Final score: Ginger: 19 / *H. pylori*: 0. [Yogurt](#)

Yogurt may also help control *H. pylori*, according to a study published in the September 2004 issue of the *American Journal of Clinical Nutrition*.

In this research, 48 adult volunteers infected with *H. pylori* ate yogurt containing two kinds of probiotic bacteria, *Lactobacillus acidophilus* and *Bifidobacterium lactis*, twice daily after a meal for 6 weeks, while 11 others received a milk placebo.

After 8 weeks, subjects were given the C-urea breath test, which measures the amount of urease, an enzyme used by *H. pylori* to allow it to penetrate and infect the stomach lining. In those receiving the yogurt containing probiotics, urease levels were way down indicating that *H. pylori* activity was effectively suppressed.

[Foods that Help Lower Homocysteine](#)

Homocysteine is created in our cells as an intermediate step in a process that is absolutely essential to our health called the methylation cycle. When our cells are supplied with the necessary amounts of betaine and the vitamins B6, B12, folate, homocysteine is quickly converted into other useful compounds. But when the foods we

eat fail to supply us with adequate amounts of these nutrients, homocysteine builds up and moves out of our cells into the bloodstream where it causes damage to the lining of our blood vessels and nerves.

Research is revealing that some individuals have a much higher need for the nutrients involved in the methylation cycle than other people. If your homocysteine levels are high, which a simple blood test can check, the following foods, rich in these nutrients, are especially important for your cardiovascular health.

And, as high homocysteine levels are also strongly linked to Alzheimer's and other dementias, to your brain's health as well. **Foods rich in B6:** spinach, red bell pepper, turnip greens, garlic, tuna, cabbage, mushrooms, broccoli, Swiss chard, cod. **Foods rich in B12:** snapper, shrimp, scallops, salmon, cod, yogurt, milk, egg. **Foods rich in folate:** romaine lettuce, spinach, asparagus, mustard greens, turnip greens, collard greens, broccoli, beets, lentils, black beans, summer squash. **Foods rich in betaine:** eggs, whole wheat, spinach and shrimp.

Don't be afraid to eat eggs. Eggs are an excellent dietary source of choline, from which our bodies derive betaine. Eggs do contain approximately 213 milligrams of cholesterol each, leading to the traditional advice about limiting egg intake. But when researchers used data from the most recent National Health and Nutritional Examination Survey (NHANES III, 1988-94) to compare the nutritional intake of diets that contained eggs with those that did not, they found that dietary cholesterol was not related to serum cholesterol concentration. As a matter of fact, in this study reported in the *Journal of the American Medical Association*, people who ate 4 eggs per week had lower mean serum cholesterol concentration than those who ate 1 egg per week (193 mg/dL vs. 197 mg/dL).

Foods that Tell Blood Vessels to Relax

In addition to their role in clearing homocysteine, folate-rich foods are essential performers in the intricate biochemical dance through which our blood vessels are instructed to be more elastic, dilate and relax. Their dance partner in this process is the essential amino acid (protein building block), arginine.

Arginine and folate affect blood vessel tone because both are needed for the production of one of the most important agents regulating blood vessel elasticity-nitric oxide. Nitric oxide, which is produced in the vascular endothelium (the lining of the blood vessels), is

made from arginine.

In the endothelium, arginine is converted into citrulline through the action of an enzyme called endothelial nitric oxide synthase or eNOS for short. This process is brought about through the action of a coenzyme called tetrahydrobiopterin. And tetrahydrobiopterin is made in the body through a pathway that requires folate in the form in which it is active in the body, which is called 5-methyltetrahydrofolate or 5MTHFR.

Without adequate folate, 5MTHFR cannot be produced. Without 5MTHFR, tetrahydrobiopterin cannot be produced. And without tetrahydrobiopterin, the process through which arginine becomes citrulline and is converted into NO cannot occur. Without NO, our blood vessels fail to dilate properly.

This is one of the primary reasons why a healthy way of eating that includes foods rich in folate and arginine, such as the Mediterranean and DASH diets, is able to lower high blood pressure as effectively as first generation hypertensive drugs.

Foods rich in folate are noted directly above under **Foods that Help Lower Homocysteine**. **Foods rich in arginine** include chocolate, [peanuts](#), most nuts and seeds ([sesame seeds](#), [walnuts](#), [cashews](#), [flaxseeds](#)) and [buckwheat](#).

Foods that Fight Cardiovascular Inflammation

Omega-3-rich foods

Cold-water fish, such as [salmon](#), [tuna](#) and [cod](#), and [flaxseeds](#), are the richest sources of these anti-inflammatory fats. These essential fatty acids are actually precursors to hormone-like substances called eicosanoids, which are converted in the body to a wide variety of cell messengers. Eicosanoids produced from the omega-3 fats talk to our genes, telling them to decrease blood clotting, blood pressure, heart rate, and inflammation, and to maintain normal, healthy heart rhythms.

This last benefit—a strong, healthy heartbeat—may be one of the most important since 50% to 60% of deaths from cardiovascular disease are a result of sudden cardiac death from sustained ventricular arrhythmias (when the heart muscle quivers instead of beats). These are the heart attacks that take even apparently healthy people with normal cholesterol levels by deadly surprise. [Extra-virgin olive oil](#)

Atherosclerosis develops from an excessive inflammatory response that causes damage to the lining of our blood vessels (the endothelium) and the smooth muscle of the artery wall. Atherosclerotic plaques form, kind of like band-aids, to cover up these damaged areas. Each step in the process through which plaques develop is regulated by the action of messenger molecules produced by the cells in the blood vessel lining and muscular walls.

A variety of compounds in extra virgin olive oil, including its monounsaturated fats, vitamin E and anti-oxidant phenols, intervene to halt virtually every step of the atherosclerotic process.

Numerous studies have shown that replacing saturated fat in the diet with olive oil's monounsaturated fats significantly lowers blood levels of cholesterol, especially LDL-cholesterol.

The monounsaturated fat in olive oil (oleic acid) also increases blood levels of HDL (good)-cholesterol. It does this, in part, by decreasing the activity of a protein called CETP (the cholesterol ester transfer protein), which dismantles HDL by moving the fats (cholesteryl esters) it contains into other cholesterol molecules. Since more cholesterol esters remain locked up in beneficial HDL, this action also means that less are available for use in the production of potentially harmful LDL.

LDL cholesterol does not cause any damage to the blood vessel unless it has first been damaged by free radicals itself. Each LDL molecule actually contains its own supply of antioxidants to protect itself against free radical damage. Olive oil, which contains both vitamin E and a number of antioxidant phenols, delivers fresh antioxidant troops to LDL, and also protects the endothelium (the lining of the blood vessels) from free radical damage.

By preventing this damage, olive oil short circuits the formation of the numerous inflammatory compounds that would have been generated in response, promoting the development of blood clots and plaques.

Type 2 Diabetes

Our ability to control our blood sugar levels is highly dependent upon our cells' ability to respond to insulin, the hormone that ushers sugar (glucose) out of the bloodstream into our cells for use in energy production.

In his discussion of diabetes in *Genetic Nutritioneering*, Dr. Bland explains how the standard American diet, which contains large amounts of refined highly processed carbohydrates, speaks to our genes, sending messages that alter our metabolism, so our cells no longer respond to insulin, and we store calories as fat rather than burning them for energy.

Insulin resistance, a hallmark of type 2 diabetes, results in high levels of sugar (glucose) circulating in the bloodstream. Recent research reveals that when excessive glucose remains in the blood, it can attach to proteins and tissues. Because the structure of these proteins, called advanced glycosylated end-products or AGEs, is altered, they can no longer function normally, so they deliver dysfunctional messages to the genes.

In addition, these AGEs "poison" our cells' energy production factories, the mitochondria. Not only does this result in insufficient energy production to meet our cells' needs, but a large increase occurs in the amount of free radicals present in our cells as well.

Because the mitochondria use oxygen in the process of creating ATP (the energy currency of the body), an unavoidable byproduct of their energy assembly line is reactive oxygen species—a type of highly damaging free radical. When our mitochondria are functioning properly, these potential cellular terrorists are quickly disarmed, but when AGEs have thrown a wrench in the mitochondrial works, cellular havoc can quickly become the order of the day.

Over time, a poor quality diet and its consequences—a bloodstream full of AGEs—can make us age prematurely. The unhealthy messages given to genes and free radical damage to our cells' energy production factories can result in damage to virtually every organ, including the skin, eyes, blood vessels, heart, kidneys, joints, and brain.

The good news is that a healthy way of eating centered on whole, antioxidant and fiber-rich foods that digest slowly, such as the Mediterranean-style diet recommended on the World's Healthiest Foods, will send a different message to your genes, one that turns this whole situation around and promotes health.

Choosing Foods that Help Maintain Healthy Blood Sugar Levels

Your best choices are antioxidant-rich foods that slowly, steadily deliver enough energy to keep you going, but not so much all at once that your bloodstream is flooded with

glucose and insulin.

The key here is that the whole foods that supply complex carbohydrates-whole grains, starchy vegetables, whole fruits, and legumes-are not only loaded with AGE-defying antioxidant phytonutrients, but are much more slowly digested, so they release sugar (glucose) for absorption into the bloodstream much more slowly than processed foods, and thus provoke much smaller releases of insulin.

Processed, refined foods, including most breads, crackers, chips, and snack foods, are largely composed of simple carbohydrates-refined wheat flour, white rice, highly processed potatoes or corn, sodas, table sugar and other added sweeteners like corn syrup and fructose. (Fruit juice, while it contains many more phytonutrients than other processed foods, is still a refined food that very rapidly floods the bloodstream with sugar, causing a corresponding spike in insulin.)

Choosing phytonutrient-rich foods according to their **glycemic load** is the best way to identify those that deliver the most protection while placing the least amount of strain on our blood sugar-regulating machinery.

You may already be familiar with the glycemic index (GI), which evaluates carbohydrate-containing foods by how much of a rise in circulating blood sugar they trigger-the higher the number, the greater the blood sugar response. So a low GI food will cause a small rise, while a high GI food will trigger a dramatic spike. A GI of 70 or more is considered high, a GI of 56 to 69 is medium, and a GI of 55 or less is low.

The glycemic load (GL) is a newer, better way to assess how a food's carbohydrate affects blood sugar levels that takes the glycemic index into account, but gives a fuller, more practical picture than the glycemic index.

A food's GI tells you only how quickly a particular carbohydrate it contains turns into sugar. It does not tell you how much of that carbohydrate is actually in a serving of a particular food. Since in real life we don't eat carbohydrate by itself, we eat food that contains it along with other things like protein, fat and fiber, you need to know a food's GL to understand its real life effect on blood sugar.

For example, the carbohydrate found in [watermelon](#) has a high GI of 72. But there isn't a lot of it, so watermelon's glycemic load is relatively low; a one cup serving (150 grams) of watermelon has a GL of only 5.7. A GL of 20 or more is high, a GL of 11 through 19 is

medium, and a GL of 10 or less is low. Similarly for **carrots** while a half-cup serving of cooked carrots has a GI of 49, the GL is only 1.5. A half-cup of raw carrots has an even lower GL of 1.0.

Other *low glycemic load, phytonutrient-dense vegetables* (an 80 gram serving-approximately 1/2 cup-has a GL ranging from 0-3) include: **asparagus**, **beets**, **bell peppers**, **broccoli**, **Brussels sprouts**, **cabbage**, **cauliflower**, **celery**, **cucumber**, **eggplant**, **green beans**, **kale**, **romaine lettuce**, **crimini mushrooms**, **spinach**, **tomatoes**, **zucchini**, **summer squash** and **pumpkin**. *Low glycemic load, phytonutrient-packed fruits* include: **apples** (1 medium has a GL of 6.8). fresh **apricots** (a serving of 3 has a GL of 4.0), **cherries** (20 of these sweet treats have a GL of just 2.2), **grapes** (the GL of one cup is 6.9), **grapefruit** (1/2 large has a GL of 3) **kiwi** (1 has a GL of 4.0), **oranges** (1 medium has a GL of 4.4), **peaches** (a large fresh peach has a GL of 3.0), **pears** (1 medium has a GL of 4), **pineapple** (2 slices of fresh pineapple7mdash;a little less than 3 ounces worth-have a GL of 6.6), **plums** (3-4 small ones have a GL of just 2.7), and **strawberries** (1 cup-4 ounces-has a GL of 1). *Beans are an excellent low GL choice* since, in addition to antioxidant phytonutrients, they're a low-calorie source of both protein and fiber. **Black beans**-the beans with the highest concentrations of antioxidant anthocyanin phytonutrients-have a GL of 5.7 per half-cup serving. **Soybeans**-another phytonutrient superstar-weigh in with an even lower GL of just 1.6 per half-cup. Even a cup of soy milk has a GL of only 3.7. Other beans with a very low GL per one-half cup serving include: **navy beans** (GL =4.2), **split peas** (5.1), **lentils** (5.3), **pinto beans** (5.8) and **garbanzo beans** (6.3). *Phytonutrient-rich low GL grains* (one serving = 1/2 cup) include: **barley** (GL = 4.25), **bulgur** (GL = 7.95), **brown rice** (GL = 8), and **millet** (GL = 8.52). Low GL breads made from whole grains (a serving = 1 slice) include: wholemeal **rye** kernel (pumpernickel) bread (GL ranges from 5-8), **whole wheat** bread (GL ranges from 8-13). Six-ounces of boiled, whole wheat spaghetti has a GL of 14.

Virtually *all nuts and seeds have a very low GL*. The GL scores for 50 grams (a little less than 2 ounces) are: **peanuts** (1), **almonds** (0), **cashews** (3), **walnuts** (0). *Low-fat yogurt* has a GL per 6 ounce serving of 3. **Eggs** (120 grams or 4 ounces) have a GL of 0.

Eating to Unlock Your Genetic Potential

The information we now have-that the foods we choose to eat deliver so much more than calories, that they contain compounds that actually affect what our genes' will express, and therefore our appearance, overall health, and longevity-is tremendously exciting.

We now know that vibrant health and youthful aging are not just a matter of luck. We can optimize our genetic potential for health every time we eat. And we know enough about the messages specific foods deliver to begin eating to unlock our genetic health potential right now.

Literally tens of thousands of studies indicate that the healthiest way of eating is one in which we enjoy a variety of the World's Healthiest Foods, each of which supplies its own array of dozens of nutrients.

We can't just rely on a few foods, even those considered nutritional superstars, to get maximal benefits. And it's obvious no pill will ever be able to deliver the myriad of genetic messages that make for optimal health.

Only by eating a variety of whole foods-**5-10 daily servings of fruits and vegetables along with whole grains, nuts, cold-water fish rich in omega-3 fats, and the healthy fats found in olive and flaxseed oils**-will we receive the 1,000s of nutrients, all of which, in their own unique ways, provide our genes with a comprehensive set of instructions for optimal health.

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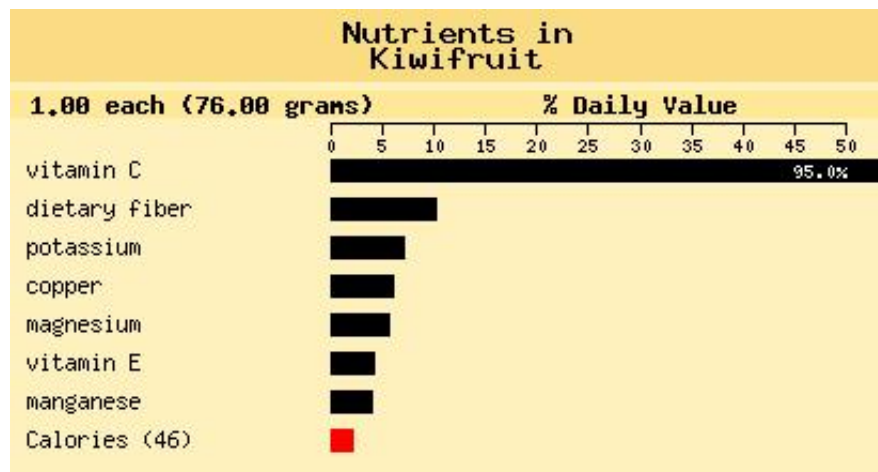


Kiwifruit

Packed with more vitamin C than an equivalent amount of orange, the bright green flesh of the kiwifruit speckled with tiny black seeds adds a dramatic tropical flair to any fruit salad. California kiwifruit is available November through May, while the New Zealand crop hits the market June through

October making fresh kiwis available year round.

The kiwifruit is a small fruit approximately 3 inches long and weighing about four ounces. Its green flesh is almost creamy in consistency with an invigorating taste reminiscent of strawberries, melons and bananas, yet with its own unique sweet flavor.



This chart graphically details the %DV that a serving of Kiwifruit provides for each of the nutrients of which it is a good, very good, or excellent source according to our Food Rating System. Additional information about the amount of these nutrients provided by Kiwifruit can be found in the Food Rating System Chart. A link that takes you to the In-Depth Nutritional Profile for Kiwifruit, featuring information over 80 nutrients, can be found under the Food Rating System Chart.

- Health Benefits
- Description
- History
- How to Select and Store
- How to Enjoy
- Individual Concerns
- Nutritional Profile
- References

Health Benefits

Kiwifruit can offer a great deal more than an exotic tropical flair in your fruit salad. These emerald delights contain numerous phytonutrients as well as well known vitamins and minerals that promote your health.

Kiwi's Phytonutrients Protect DNA

In the world of phytonutrient research, kiwifruit has fascinated researchers for its ability to protect DNA in the nucleus of human cells from oxygen-related damage. Researchers are not yet certain which compounds in kiwi give it this protective antioxidant capacity, but they are sure that this healing property is not limited to those nutrients most commonly associated with kiwifruit, including its vitamin C or beta-carotene content. Since kiwi contains a variety of flavonoids and carotenoids that have demonstrated antioxidant activity, these phytonutrients in kiwi may be responsible for this DNA protection.

The protective properties of kiwi have been demonstrated in a study with 6- and 7-year-old children in northern and central Italy. The more kiwi or citrus fruit these children consumed, the less likely they were to have respiratory-related health problems including wheezing, shortness of breath, or night coughing. These same antioxidant protective properties may have been involved in providing protection for these children.

Premier Antioxidant Protection

Kiwifruit emerged from our food ranking system as an excellent source of [vitamin C](#). This nutrient is the primary water-soluble antioxidant in the body, neutralizing free radicals that can cause damage to cells and lead to problems such as inflammation and cancer. In fact, adequate intake of vitamin C has been shown to be helpful in reducing the severity of conditions like osteoarthritis, rheumatoid arthritis, and asthma, and for preventing conditions such as colon cancer, atherosclerosis, and diabetic heart disease. And since vitamin C is necessary for the healthy function of the immune system, it may be useful for preventing recurrent ear infections in people who suffer from them. Owing to the multitude of vitamin C's health benefits, it is not surprising that research has shown that consumption of vegetables and fruits high in this nutrient is associated with a reduced risk of death from all causes including heart disease, stroke and cancer.

Kiwifruit is also a good source of the important fat-soluble antioxidant, [vitamin E](#). This combination of both fat- and water-soluble antioxidants makes kiwi able to provide free radical protection on all fronts.

Fiber for Blood Sugar Control Plus Cardiovascular and Colon Health

Our food ranking system also qualified kiwifruit as a very good source of [dietary fiber](#).

The fiber in kiwifruit has also been shown to be useful for a number of conditions. Researchers have found that diets that contain plenty of fiber can reduce high cholesterol levels, which may reduce the risk of heart disease and heart attack. Fiber is also good for binding and removing toxins from the colon, which is helpful for preventing colon cancer. In addition, fiber-rich foods, like kiwifruit, are good for keeping the blood sugar levels of diabetic patients under control.

Kiwifruit also passed our food ranking test as a good source of the minerals potassium, magnesium, copper and phosphorus.

Protection against Asthma

Eating vitamin C-rich fruit such as kiwi may confer a significant protective effect against respiratory symptoms associated with asthma such as wheezing.

A study published in *Thorax* that followed over 18,000 children aged 6-7 years living in Central and Northern Italy found that those eating the most citrus and kiwifruit (5-7 servings per week) had 44% less incidence of wheezing compared to children eating the least (less than once a week). Shortness of breath was reduced by 32%, severe wheeze by 41%, night time cough by 27%, chronic cough by 25%, and runny nose by 28%.

Children who had asthma when the study began appeared to benefit the most, and protective effects were evident even among children who ate fruit only once or twice a week.

Protection against Macular Degeneration

Your mother may have told you carrots would keep your eyes bright as a child, but as an adult, it looks like fruit is even more important for keeping your sight. Data reported in a study published in the *Archives of Ophthalmology* indicates that eating 3 or more servings of fruit per day may lower your risk of age-related macular degeneration (ARMD), the primary cause of vision loss in older adults, by 36%, compared to persons who consume less than 1.5 servings of fruit daily.

In this study, which involved over 110,000 women and men, researchers evaluated the effect of study participants' consumption of fruits; vegetables; the antioxidant vitamins A, C, and E; and carotenoids on the development of early ARMD or neovascular ARMD, a more severe form of the illness associated with vision loss. Food intake information was collected periodically for up to 18 years for women and 12 years for men. While,

surprisingly, intakes of vegetables, antioxidant vitamins and carotenoids were not strongly related to incidence of either form of ARM, fruit intake was definitely protective against the severe form of this vision-destroying disease. Three servings of fruit may sound like a lot to eat each day, but kiwifruit can help you reach this goal. Slice kiwi over your morning cereal, lunch time yogurt or green salads. For a more elegant meal, decorate any fish dish or fruit salad with kiwi slices.

A Delicious Way to Enjoy Cardiovascular Health

Enjoying just a couple of kiwifruit each day may significantly lower your risk for blood clots and reduce the amount of fats (triglycerides) in your blood, therefore helping to protect cardiovascular health.

Unlike aspirin, which also helps to reduce blood clotting but has side effects such as inflammation and bleeding in the intestinal tract, the effects of regular kiwi consumption are all beneficial. Kiwifruit is an excellent source of vitamin C, and polyphenols, and a good source of vitamin E, magnesium, potassium, and copper, all of which may function individually or in concert to protect the blood vessels and heart. In one study, human volunteers who ate 2 to 3 kiwifruit per day for 28 days reduced their platelet aggregation response (potential for blood clot formation) by 18% compared to controls eating no kiwi. In addition, kiwi eaters' triglycerides (blood fats) dropped by 15% compared to controls.

Description

The kiwifruit is a little fruit holding great surprises. The most common species of kiwifruit is *Actinidia deliciosa*, commonly known as Hayward kiwi. Inside of this small, oval-shaped fruit featuring brown fuzzy skin resides a brilliant, semi-translucent emerald green flesh speckled with a few concentrically arranged white veins and small black seeds. Its flesh is almost creamy in consistency with an invigorating taste reminiscent of a mixture of strawberries and bananas, yet with its own unique sweet flavor.

With the growing interest in kiwifruit, other species are now becoming more widely available. These include the hardy kiwi and the silvervine kiwi, two smooth-skinned varieties that are the size of cherries and whose flesh has a golden yellow-green hue.

History

The kiwifruit is a fruit with a very interesting history and whose recent rise in popularity reflects a combination of an appreciation for its taste, nutritional value, unique appearance and, surprisingly, its changing name.

Native to China, kiwifruits were originally known as Yang Tao. They were brought to New Zealand from China by missionaries in the early 20th century with the first commercial plantings occurring several decades later. In 1960, they were renamed Chinese Gooseberries.

In 1961, Chinese Gooseberries made their first appearance at a restaurant in the United States and were subsequently "discovered" by an American produce distributor who felt that the U.S. market would be very receptive to this uniquely exotic fruit. She initiated the import of these fruits into the United States in 1962, but to meet what was felt to be burgeoning demand, changed its name from Chinese Gooseberry to kiwifruit, in honor of the native bird of New Zealand, the kiwi, whose brown fuzzy coat resembled the skin of this unique fruit. Currently, Italy, New Zealand, Chile, France, Japan and the United States are among the leading commercial producers of kiwifruit.

How to Select and Store

When selecting kiwifruits, hold them between your thumb and forefinger and gently apply pressure; those that have the sweetest taste will yield gently to pressure. Avoid those that are very soft, shriveled or have bruised or damp spots. As size is not related to the fruit's quality, choose a kiwifruit based upon your personal preference or recipe need. Kiwifruits are usually available throughout most of the year.

If kiwifruits do not yield when you gently apply pressure with your thumb and forefinger, they are not yet ready to be consumed since they will not have reached the peak of their sweetness. Kiwifruits can be left to ripen for a few days to a week at room temperature, away from exposure to sunlight or heat. Placing the fruits in a paper bag with an apple, banana or pear will help to speed their ripening process. Ripe kiwifruits can be stored either at room temperature or in the refrigerator.

For the most antioxidants, consume fully ripened kiwifruit:

Research conducted at the University of Innsbruck in Austria suggests that as fruits fully ripen, almost to the point of spoilage, their antioxidant levels actually increase.

Key to the process is the change in color that occurs as fruits ripen, a similar process to that seen in the fall when leaves turn from green to red to yellow to brown- a color change caused by the breakdown and disappearance of chlorophyll, which gives leaves and fruits their green color.

Until now, no one really knew what happened to chlorophyll during this process, but lead researcher, Bernard Kräutler, and his team, working together with botanists over the past several years, has identified the first decomposition products in leaves: colorless, polar NCCs (nonfluorescing chlorophyll catabolytes), that contain four pyrrole rings - like chlorophyll and heme.

After examining apples and pears, the scientists discovered that NCCs replace the chlorophyll not only in the leaves of fruit trees, but in their very ripe fruits, especially in the peel and flesh immediately below it.

"When chlorophyll is released from its protein complexes in the decomposition process, it has a phototoxic effect: when irradiated with light, it absorbs energy and can transfer it to other substances. For example, it can transform oxygen into a highly reactive, destructive form," report the researchers. However, NCCs have just the opposite effect. Extremely powerful antioxidants, they play an important protective role for the plant, and when consumed as part of the human diet, NCCs deliver the same potent antioxidant protection within our bodies. . [Angew Chem Int Ed Engl. 2007 Nov 19;46\(45\):8699-8702.](#)

How to Enjoy

For some of our favorite recipes, click [Recipes](#).

Tips for Preparing Kiwifruit:

Kiwifruits are so delicious that they can be eaten as is. They can be peeled with a paring knife and then sliced or you can cut them in half and scoop the flesh out with a spoon. You can also enjoy the skins which are very thin like a Bosc pear and are full of nutrients and fiber; the peachlike fuzz can be rubbed off before eating.

Kiwifruits should not be eaten too long after cutting since they contain enzymes (actinic and bromic acids) that act as a food tenderizer, with the ability to further tenderize the kiwifruit itself and make it overly soft. Consequently, if you are adding kiwifruit to fruit salad, you should do so at the last minute so as to prevent the other fruits from

becoming too soggy.

While sliced kiwi fruit may soften other fruits when combined in fruit salad, a study published in the June 2006 issue of the *Journal of Agricultural and Food Chemistry* has found that minimal processing of kiwi and other fruits-cutting, packaging and chilling-does not significantly affect their nutritional content even after 6, and up to 9, days.

Researchers cut up kiwi fruit, pineapples, mangoes, cantaloupes, watermelons, and strawberries. The freshly cut fruits were then rinsed in water, dried, packaged in clamshells (not gastight) and stored at 41 degrees Fahrenheit.

After 6 days, losses in vitamin C were less than 5% in mango, strawberry, and watermelon pieces, 10% in pineapple pieces, 12% in kiwifruit slices, and 25% in cantaloupe cubes.

No losses in carotenoids were found in kiwifruit slices and watermelon cubes. Pineapples lost 25%, followed by 10-15% in cantaloupe, mango, and strawberry pieces.

No significant losses in phenolic phytonutrients were found in any of the fresh-cut fruit products.

"Contrary to expectations, it was clear that minimal processing had almost no effect on the main antioxidant constituents. The changes in nutrient antioxidants observed during nine days at five degrees Celsius would not significantly affect the nutrient quality of fresh cut fruit. In general, fresh-cut fruits visually spoil before any significant nutrient loss occurs," wrote lead researcher Maria Gil.

In practical terms, this means that you can prepare a large bowl of fruit salad on the weekend, store it in the refrigerator, and enjoy it all week, receiving almost all the nutritional benefits of just prepared fruit salad. To ensure kiwi fruit does not "tenderize" the other fruits in your salad, store sliced kiwi in a separate air-tight container and add to the rest of the fruit salad just before serving.

A Few Quick Serving Ideas:

Kiwifruit are so delicious, they can be eaten as is. One of our favorite ways to do so is to peel with a paring knife and slice.

Add kiwifruit to tossed green salads.

Serve sliced kiwifruit and strawberries, fruits whose flavors are naturally complementary, topped with yogurt.

Mix sliced kiwifruit, orange and pineapple together to make chutney that can be served as an accompaniment to chicken or fish.

Blend kiwifruit and cantaloupe in a food processor to make a chilled soup. For a creamier consistency, blend yogurt in with the fruit mixture.

Kiwifruit have a wonderful flavor and appearance for use in fruit tarts.

Individual Concerns

Kiwifruit and Oxalates

Kiwifruit are among a small number of foods that contain measurable amounts of oxalates, naturally-occurring substances found in plants, animals, and human beings. When oxalates become too concentrated in body fluids, they can crystallize and cause health problems. For this reason, individuals with already existing and untreated kidney or gallbladder problems may want to avoid eating kiwifruit. Laboratory studies have shown that oxalates may also interfere with absorption of calcium from the body. Yet, in every peer-reviewed research study we've seen, the ability of oxalates to lower calcium absorption is relatively small and definitely does not outweigh the ability of oxalate-containing foods to contribute calcium to the meal plan. If your digestive tract is healthy, and you do a good job of chewing and relaxing while you enjoy your meals, you will get significant benefits-including absorption of calcium-from calcium-rich foods plant foods that also contain oxalic acid. Ordinarily, a healthcare practitioner would not discourage a person focused on ensuring that they are meeting their calcium requirements from eating these nutrient-rich foods because of their oxalate content. For more on this subject, please see ["Can you tell me what oxalates are and in which foods they can be found?"](#)

Kiwifruit and Latex Allergy

Like avocados and bananas, kiwifruit contain substances called compounds that are associated with the latex-fruit allergy syndrome. There is strong evidence of the cross-reaction between latex and these foods. If you have a latex allergy, you may very likely

be allergic to these foods as well. Processing the fruit with ethylene gas increases these enzymes; organic produce not treated with gas will have fewer allergy-causing compounds. In addition, cooking the food deactivates the enzymes.

Nutritional Profile

Kiwifruit is an excellent source of vitamin C and a very good source of dietary fiber. It is also a good source of the minerals potassium, magnesium, and copper. In addition, kiwifruit is a good source of the antioxidant vitamin E.

For an in-depth nutritional profile click here: [Kiwifruit](#).

In-Depth Nutritional Profile

In addition to the nutrients highlighted in our ratings chart, an in-depth nutritional profile for [Kiwifruit](#) is also available. This profile includes information on a full array of nutrients, including carbohydrates, sugar, soluble and insoluble fiber, sodium, vitamins, minerals, fatty acids, amino acids and more.

Introduction to Food Rating System Chart

In order to better help you identify foods that feature a high concentration of nutrients for the calories they contain, we created a Food Rating System. This system allows us to highlight the foods that are especially rich in particular nutrients. The following chart shows the nutrients for which this food is either an excellent, very good, or good source (below the chart you will find a table that explains these qualifications). If a nutrient is not listed in the chart, it does not necessarily mean that the food doesn't contain it. It simply means that the nutrient is not provided in a sufficient amount or concentration to meet our rating criteria. (To view this food's in-depth nutritional profile that includes values for dozens of nutrients - not just the ones rated as excellent, very good, or good - please use the link below the chart.) To read this chart accurately, you'll need to glance up in the top left corner where you will find the name of the food and the serving size we used to calculate the food's nutrient composition. This serving size will tell you how much of the food you need to eat to obtain the amount of nutrients found in the chart. Now, returning to the chart itself, you can look next to the nutrient name in order to find the nutrient amount it offers, the percent Daily Value (DV%) that this amount represents, the nutrient density that we calculated for this food and nutrient, and the rating we established in our rating system. For most of our nutrient ratings, we adopted

the government standards for food labeling that are found in the U.S. Food and Drug Administration's "Reference Values for Nutrition Labeling." [Read more background information and details of our rating system.](#)

Kiwifruit 1.00 each 76.00 grams 46.36 calories					
Nutrient	Amount	DV (%)	Nutrient Density	World's Healthiest Foods Rating	
vitamin C	57.00 mg	95.0	36.9	excellent	
dietary fiber	2.58 g	10.3	4.0	very good	
potassium	252.32 mg	7.2	2.8	good	
copper	0.12 mg	6.0	2.3	good	
magnesium	22.80 mg	5.7	2.2	good	
vitamin E	0.85 mg	4.3	1.7	good	
manganese	0.08 mg	4.0	1.6	good	
World's Healthiest Foods Rating	Rule				
excellent	DV>=75%	OR	Density>=7.6	AND	DV>=10%
very good	DV>=50%	OR	Density>=3.4	AND	DV>=5%
good	DV>=25%	OR	Density>=1.5	AND	DV>=2.5%

In-Depth Nutritional Profile for [Kiwifruit](#)

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