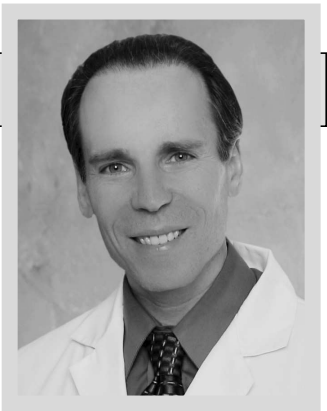


JOEL FUHRMAN, MD

Do vegetables lose nutrients when cooked?



Every day, we should eat a combination of raw and cooked vegetables, because the effects of cooking are different depending on which nutrients we're talking about.

Cooking modifies the physical and chemical properties of foods. It causes degradation or loss of certain nutrients and phytochemicals, but also softens cell walls and other food matrix components, facilitating the extraction and absorption of others.

Many nutrients are damaged by heat, light, or oxygen. Vitamin C appears to be the nutrient most vulnerable to cooking; about 30 percent of vitamin C in leafy greens is destroyed by cooking (if cooking water is consumed, as in cooking a soup).

Other nutrients degraded by heat are folate, other B vitamins, and phenol antioxidants. Minerals and fat-soluble vitamins (A, D, E, and K) are more stable in heated conditions.

Cruciferous vegetables contain valuable nutrients called glucosinolates, which are converted to cancer-fighting isothiocyanates (ITCs) when the plant cells are broken up by chopping or chewing.

Importantly, heat inactivates the enzyme (myrosinase) that drives this conversion, so chopping (preferably blending) these vegetables before cooking them is important. Blending

the raw greens and then adding them to a soup or stew conserves ITCs. After that, steaming-compared to stir-frying, boiling and microwaving-resulted in the smallest glucosinolate losses in broccoli, but the less it is cooked the better.

Remember though that the myrosinase is deactivated by heat, so in order to produce more isothiocyanates from the remaining glucosinolates after cooking, eat some raw cruciferous with that meal or add some raw cruciferous (such as shredded cabbage) to the cooked greens.

Carotenoids, such as alpha-carotene, beta-carotene, and lycopene are not only heat stable, but actually more absorbable once foods are cooked. Carotenoids are inside the plant cells, embedded in the matrix of the food, and some of the cellular structure must be mechanically disrupted (such as by blending or heating) to make the carotenoids extractable by the digestive system.

Vitamin E fractions from plant foods have also been reported to be more bioaccessi-

ble after heating. A study on raw foodists found that lycopene status was low without eating any cooked foods.

Fat intake in that study was associated with better plasma carotenoid status-adding fat is a way to improve carotenoid absorption from raw vegetables. One study measured alpha-carotene, beta-carotene, and lycopene in the blood after subjects ate salads topped with fat-free dressing, or dressings containing either 6 or 28 grams of fat.

Carotenoid absorption was negligible from the salad with fat-free dressing, and high from the fat-containing dressings. Salad dressings made by blending nuts and seeds (instead of using oil) are the healthiest.

Some nutrient loss occurs when fresh foods are stored.

Produce that has been shipped a long distance will likely have less nutritional value than the same produce bought locally. Frozen vegetables do have lower levels of vitamin C, thiamin, riboflavin, and niacin loss due to the blanching step of the freezing process.

However, once the food is frozen, nutrient losses due to storage slow down substantially. Plus, frozen vegetables are picked fresh and frozen soon after, preserving a large proportion of the nutrients.

For frozen fruits, there is minimal loss of polyphenol antioxidants (such as flavonoids) because fruits are not blanched before they are frozen.

Sometimes nutrients are not destroyed by heat, but can be lost in the cooking water if boiling or steaming-this is why soups are a good cooking method for vegetables.

Remember to avoid high-heat dry cooking and browning to prevent the formation of acrylamide-a possible carcinogen formed in cooked starchy foods.

A good general guideline to maximize nutrient quantity and variety is to eat a large variety of raw and gently cooked vegetables-large daily salads plus vegetable-bean soups or stews, or vegetables cooked in a wok with water or steamed for only 10 minutes.

Remember: Eat a large green salad, containing a variety of raw vegetables, with a nut and seed based dressing at least once a day.

Suggested healthy cooking methods for vegetables:

- Steam greens in a wok alternating covering and stirring.
- Steam greens in a steamer for 10 minutes or less
- Half artichokes up the middle and steam for 18-20 minutes
- Boil sweet potatoes, cook

carrots and parsnips in soups and stews

- Bake hard squashes at a low oven temperature (325° F) for 1 hour
- Wok or steam mushrooms, or add to soups and stews
- Puree raw cruciferous greens, shallots and onions before adding to soups and stews

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