

Nutri Q & A Chima  
Food Storage and Nutrients

Q: How long do foods retain their nutrients? When you purchase vegetables and store them in the refrigerator, how long are they good? With only 2 people to cook for, sometimes I can't use them quickly. After 1-2 weeks, is the nutritional value so depleted that they're not worth using? JG

A: Good question, JG. Even in larger families, varying work shifts and overscheduled children mean it's hard to predict how quickly fresh fruits and vegetables will be used at mealtime. Most of the recommended storage times for foods are based either on food safety issues or quality in terms of taste and appearance. And good taste and appearance are no guarantee of nutritional content.

Researchers at Penn State recently studied the effects of storage on the nutrient content of fresh spinach. Spinach stored at cooler temperatures retained more nutrients than at warmer temperatures. But even at 39 degrees, the spinach retained only 53% of its folate after eight days. The researchers concluded that, despite the damage done to nutrients by heat processing, canned spinach may retain more of its nutrients than fresh spinach kept in the refrigerator for a few days.

I don't know about you, but I'm not about to switch to canned spinach. Canned spinach, canned corn and succotash remind me too much of elementary school lunches back in the Dark Ages. (They used to make us clean our plates, too.)

To put things in perspective, refrigerated spinach still retained more than half its folate at eight days (and spinach has a lot of folate.) I'm lucky if spinach lasts a week in my vegetable crisper.

So what can you do?

1. Know which nutrients are most vulnerable (see table). That's mostly vitamins (we aren't sure about phytochemicals). The good news is that protein, carbohydrate, energy, and minerals are little affected by storage (would be nice if we could lose a few calories, wouldn't it?)
2. Keep fresh vegetables at the coldest possible temperature without freezing in the vegetable crisper of your refrigerator. Spinach, broccoli, and salad greens retain their nutrients best in high humidity.
3. Carrots, sweet potatoes, potatoes, and other root vegetables keep their key nutrients reasonably well if kept cool and moist.
4. Ripen fruits at room temperature; then refrigerate or use immediately.
5. Keep fresh fruits and vegetables, dairy and juice products away from light. (That's why milk and many juices are sold in opaque containers these days.)
6. High heat reduces nutrient content, even of canned goods. Cool, dark places are best (50-70 degrees.) That's why grandma kept canned goods in the cellar.
7. Eat close to the farm. I know, you can't buy homegrown in Ohio in January, but, remember that foods shipped across the country are often unrefrigerated and leaking nutrients along the way. When you can, buy in season and buy local.

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8. Consider choosing heirloom varieties of fruits and vegetables when you have a choice. You'll get a bonus in flavor. A 2004 study at the University of Texas suggests that the nutrient value of garden crops has declined from 1950 to 1999. Researchers speculate that this is because of the modern focus on hybrids that produce greater yields.
9. Buy fresh foods in smaller quantities so you can use them quickly. Share with a friend. Or use some fresh and freeze the rest. Freezing is an excellent way of retaining nutrients, including vitamins.
10. Buy frozen vegetables in loose-pack bags. I use a lot of frozen vegetables because I'm never sure how many people will be sitting down at my table. I can pour out as much as I need and return the rest to the freezer. Frozen vegetables are sometimes more nutritious than fresh kept around forever.
11. Keep your freezer below 0 degrees F. and your refrigerator below 40 degrees.
12. Don't make your loving care irrelevant through your cooking methods. High heat and long cooking take a toll on nutrient content. If you boil your vegetables, you throw out water-soluble vitamins in the cooking water. Steam, grill, roast, stir-fry or microwave instead. Trim with a judicious hand. Eat the peels and outer leaves, after scrubbing.

**For More Information**

This web site of the Utah State Extension Service includes a large table of recommended storage times and conditions for various foods. Keep in mind that these are not necessarily based on a study of nutrient losses.

<http://extension.usu.edu/files/foodpubs/fn502.pdf>

Stability of Various Nutrients in Storage	
Nutrient	Stability
Vitamin A	Sensitive to air, light and heat
Vitamin C*	Sensitive to air, light and heat
Vitamin D	Somewhat sensitive to air, light and heat
Thiamin*	Sensitive to air, and heat
Folic Acid*	Sensitive to air, light, and heat
Vitamin K	Somewhat sensitive to air and light
Vitamin B-6	Sensitive to light and heat
Riboflavin	Sensitive to light and heat
Biotin, Niacin	Relatively stable
Carotenes	Sensitive to air, light, and heat
Protein, carbohydrate, energy (calories)	Relatively stable
Fat	Can become rancid, particularly at higher temperatures
	*These nutrients are most unstable