

How the Right Knife Can Increase Nutrients

Analysis by [Dr. Joseph Mercola](#)

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STORY AT-A-GLANCE

- › Tearing vegetables like raw spinach and leafy greens was the preferred method over cutting them, as experts thought it had less of a tendency to disrupt the cells and damage the nutrients, but chopping with a knife may also be beneficial
- › One of the benefits of chopping veggies has to do with increasing polyphenol levels in foods; one study showed phenolic boosts up to 191%, with antioxidant capacity boosts up to 442%
- › Polyphenols in foods may reduce the risk of three common health conditions – urinary tract infections, cardiovascular disease and Type 2 diabetes, so a boost from chopping or slicing may increase the benefits exponentially
- › Browning of foods like apples is one of the problems with cutting them but, in testing, plastic knives prevented browning a full day longer than metal, and using a ceramic knife visibly slowed the browning process

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Knives have lots of uses in the kitchen. If you want to get really fancy, the right knife, as well as the right method, can produce the perfect julienne or chiffonade. But there are other things using the right knife can do you may not be aware of yet. One of the most important is increasing the nutrients foods provide your body.

Not so long ago, aspiring chefs were all about tearing their leafy greens so they wouldn't bruise them. Chopping lettuce and spinach for a salad was considered gauche. An

article in *The Conversation* captures the chef's dilemma very well:¹

"For a long time, we've believed tearing vegetables, especially salad leaves, is the best way to preserve their nutrients. The idea is that tearing leaves disrupts the cells of the plant less than chopping. Chopping slices straight through cells allowing their contents to spill out. This means nutrients, especially minerals such as potassium can leak away."

Chopping Vegetables Releases More Polyphenols

There's a school of thought, however, that says chopping vegetables – at least some of them – increases the polyphenols they provide. Only available from plants, **polyphenols** have several different jobs, such as providing the plant's color and protecting the plant against damage from ultraviolet radiation.

If certain vegetables get nicked or cut, such as **celery**, **parsnips** and **lettuce**, they'll produce more polyphenols to defend against further damage. If an animal is trying to eat it, for instance, the bitterness of the polyphenols may keep them from taking a second bite. In humans, chopping veggies or slicing them may make the bioactive compounds in them more bioavailable, and health benefits can be derived from "synergistic" combinations of phytochemicals.²

Antioxidants are important compounds that help protect you against harmful **free radicals** as well as inflammation. For the record, polyphenols are phenomenal. They're the most abundant antioxidants in the U.S. diet, *The American Journal of Clinical Nutrition* says, providing 10 times higher intake levels than the intake of vitamin C, and 100 times higher than either vitamin E or carotenoid intake.³

*Nutrition Today*⁴ noted a wide array of health benefits attributed to polyphenols in foods, particularly in "reducing the risk of three common health conditions – **urinary tract infections**, cardiovascular disease and Type 2 diabetes," although the same report's caveat was that such advantages are not yet "settled science."

One study showed that depending on the type of fruit or vegetable tissue, “wounding” or cutting vegetables may also increase their antioxidant capacity. **Zucchini**, white and red cabbage, **iceberg lettuce**, celery, **carrot**, parsnips, red radish, **sweet potato** and white potatoes were all evaluated for several nutritional characteristics:⁵

“Phenolic changes ranged from a 26% decrease to an increase up to 191%, while antioxidant capacity changes ranged from a 51% decrease to an increase up to 442%. Reduced ascorbic acid decreased up to 82%, whereas the changes in anthocyanins and carotenoids were less evident.”

Chopping Veggies Affects Their Nutrients and Color

Chopping veggies sometimes causes a problem that detailed cooks are careful to remedy, and that’s enzymatic browning. You’ve probably seen it; peeled potatoes take on an unsightly brown shade before you even get to the second one. This phenomenon occurs due to the enzyme polyphenol oxidase breaking down the polyphenols. Sometimes it’s caused by oxygen hitting the newly cut veggie, intermingling the polyphenol oxidase and polyphenols, which are phytochemicals.

Phenol compounds turn brown, which causes some cut foods to take on a rusty tinge. Believe it or not, the knife you use can make all the difference. It’s all about the speed at which the browning phenomenon occurs, and that depends on the knife you use.

Iron and copper increase the browning rate, and that’s what most stainless steel knives are made from, among other metals. In the cutting, your veggies get the triple whammy of oxygen and the concoction created by mixing the abovementioned metals.

There are alternatives, however. Ceramic and plastic knives are “chemically inert,” which is said to slow the browning process. In testing, *Cook’s Illustrated*⁶ found that using a plastic knife delayed browning for a full day longer than metal or tearing by hand. Ceramic knives and stainless steel knives were also tested, and while neither prevented rust entirely, the results were visibly better with the ceramic knife.

Rather than replacing all your other knives, you can use ceramic blades to complement your other cutlery.⁷ They're best for slicing fruit, vegetables and boneless meat, but not for **frozen foods**, meat with bones or cheese (because of its tendency to stick) or using the blade to crush foods like garlic.

Taste, Texture and Refrigeration

Chopping can also change the texture, making some foods soft and mushy, as well as the flavor. Refrigeration can slow down both of these processes. The Conversation notes:⁸

“Refrigeration might help slow the rate of this browning reaction and so help preserve the potentially beneficial polyphenol content. This works as the cold temperatures in the fridge slow down the chemical reactions, which normally would break down the polyphenols ...

But the very act of the vegetable producing polyphenols (say after chopping) often involves using up vitamin C. So, nutritionally it could be a case of 'robbing Peter to pay Paul' and there may not be any overall benefits.”

Chopping veggies can change a vegetable's taste, rendering them slightly bitter. But “bruising” your leafy greens and herbs before placing them in your recipe can bring out flavor that simply removing them from the stem won't impart, and your teeth won't do the job well enough to glean the nutritional benefit. According to The Kitchn:⁹

“When you roll up your herbs and chop them into tasty little bits to flavor your dishes, only the cells that the knife hit are the ones releasing their herb-y oils into your food. If you're tossing them into something like a sauce that will be simmering for a length of time, then no worries, the oils in combination with the heat from your stove will eventually seep out.”

Five Veggies That Are Tough to Cut and How to Cut Them

Every once in a while, it's good to broaden your horizons and have something for dinner that's slightly out of the norm. If you hesitate to reach for certain veggies because you're not sure what to do with them, the simple steps below will help. You'll notice that using specific knives makes the job easier, as does a cutting board.

Artichoke

They look like large, rubbery flowers, but it's often the tender heart that you want to get to, and that takes a bit of know-how.¹⁰

Instructions

1. Pull off the outer green leaves to expose the lighter yellow ones.
2. Use a serrated knife to cut off both the top third of the artichoke (which will reveal the top of tightly folded purple choke "petals") and the stem bottom.
3. Use a paring knife to peel away the yellow top and sides to get to the heart, then trim off the outer portion of the stem, similar to peeling a broccoli stem. Trim carefully so you don't start peeling away the heart.
4. Now a pale bulb with the feathery, purple "choke" intact, use your paring knife and a spoon to carefully remove it, and you're finished.

Beets

Sometimes called beetroots, these versatile veggies are flavorful and delicious in cold salads or hot soup. There's a trick to keep the color, though.¹¹

Instructions

1. Use a sharp knife to cut off the greens, but make sure you leave about half an inch of leafy stems at the top.
2. Scrub the beets with a brush and cook in enough boiling water to cover them, stick a fork in them to ensure “doneness,” then halt the cooking process by plunging them into cold water.
3. After they’ve cooled, use a paring knife to cut off the stem, then rub away the skin with kitchen paper; it should peel off easily. Cut into slices or cubes.

Spaghetti Squash

This veggie calls for a sturdy knife, a fork and a spoon.¹²

Instructions

1. Use your knife to poke dashes all over the skin to allow steam to escape while it’s cooking.
2. Bake whole in a 400 degrees Fahrenheit preheated oven for 10 minutes or until it’s soft enough to slice in two.
3. Place the squash on your cutting board and cut it lengthwise.
4. Use the spoon to remove the seeds, then use a fork to scrape out the squash, which falls into strands like spaghetti, into a serving dish.

Kohlrabi

Tasting quite a bit like the heart of cabbage or broccoli, a sharp, sturdy knife, as well as a veggie peeler, will get to the white goodness inside.¹³

Instructions

1. Cut off the stem and leaves, and slice the kohlrabi into quarters.
2. Cut out the core (roughly an inch square) from the center and discard. Remove the skin with the peeler.
3. Cut the slices into matchsticks, aka julienne, or cubes.

Celeriac

Also known as “knob celery,” celeriac looks like a tough, fibrous bulb of compacted roots, but get to the heart of the matter and it tastes like strong celery, which is great for soups or stews or raw in salads. A sharp knife is all you need.¹⁴

Instructions

1. Cut off the top, which includes the leaves as well as the base, which will allow the “knob” to sit flat on your cutting board.
2. Use your sharp knife to peel off the sides in wide strips, saving as much of the white veggie inside as you can.
3. Chop, julienne or slice as desired, placing the pieces in cold water with a bit of lemon juice to keep them from turning brown.

A Note on Vegetables

Sadly, only 27% of Americans are eating what they should for optimal health.¹⁵ Here’s the bottom line – While chopping, slicing or otherwise “wounding” your vegetables does serve to release more polyphenols than you’d get if you simply bit into them, the

takeaway is that you need to eat adequate amounts of well-cooked vegetables to ensure you get the health advantages, including the polyphenols, they provide.

Sources and References

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