S

pinach, kale, collards, mustard greens, beet greens, romaine lettuce, and other leafy greens. They’re the standout vegetables, jam-packed with vitamins A, C, and K, folate, potassium, magnesium, iron, lutein, and phytochemicals.

And it’s not unusual to see studies on diet and disease give them special recognition with a phrase like “vegetables—especially green leafy vegetables—were associated with a lower risk of....”

All vegetables are good vegetables (except, perhaps, white potatoes). But greens have something more going for them. Here’s a sampling of some findings—and a few hunches—that may explain what’s so good about greens.

EYES

As you age, your eyes age.

The older lens no longer adjusts as well to see accurately at different distances, and the older pupil no longer dilates as much to let light reach the retina. An 80-year-old retina receives one-sixth the light of a 20-year-old retina in a well-lit room and one-sixteenth as much light in a darker room.

Worse yet, the older eye is more vulnerable to cataracts (clouded lens) and macular degeneration (deterioration of the center of the retina, or macula). Macular degeneration is the leading cause of blindness in people over the age of 60.

On the bright side, two carotenoid pigments in leafy greens—lutein and zeaxanthin—may help protect both the lens and the retina.

“Leafy greens are incredibly high in lutein and zeaxanthin, so just one or two servings a week places people in the highest intakes,” says Julie Mares of the Department of Ophthalmology and Visual Sciences at the University of Wisconsin.

Researchers got interested in the two carotenoids in part because both concentrate in the eye. “The macular pigment is composed of lutein and zeaxanthin,” says Mares. “The concentration in the macula is 100-fold higher than in the blood.”

What’s more, she adds, “they’re the only carotenoids that accumulate in the lens, though the level in the lens is much lower than in the macula.”

How might lutein and zeaxanthin protect the eye?

“In both the lens and the retina, we suspect that they act as antioxidants that scavenge marauding oxygen molecules called free radicals,” says Mares.

“In the retina, we think that they also act as a filter that absorbs short wavelength—or blue—light, which is toxic to the retina.”

But the human evidence that leafy greens—or lutein and zeaxanthin—can protect the eye is still modest.

In several large studies, people who reported consuming the most lutein and zeaxanthin had a 20 to 50 percent lower risk of cataract extractions. Other studies found a lower risk of macular degeneration in people who consumed the most lutein and zeaxanthin. However, some studies found no link or only saw it in women younger than 75.

“The data are stronger for cataracts than for macular degeneration to date,” says Mares. But that could be because cataracts are so much more common, which makes them easier to study.

Bottom line: it’s too early to conclude that lutein and zeaxanthin can protect the eyes, but it’s still worth eating leafy greens. “I do,” says Mares. “They’re so rich in micronutrients, there’s sufficient evidence that they may protect the eyes, and there’s no evidence that they’re deleterious.”

BONES

Which foods keep your skeleton strong?

Most people would never think of kale, collards, spinach, and other greens as bone builders.

Yet researchers suspect that green leafy vegetables protect bone because they’re loaded with vitamin K.

“They’re the best known source of vitamin K,” says Sarah Booth of the Jean Mayer USDA Human Nutrition Research Center on Aging at Tufts University in Boston. “It’s part of photosynthesis, so anything that’s green has vitamin K.”

Vitamin K is best known for its ability to help blood clot, but a growing body of evidence suggests that it does much more. “Vitamin K is important for proper functioning of bone-dependent proteins,” explains the Research Center’s Katherine Tucker. “Bone is constantly breaking down and rebuilding, and it needs those proteins to rebuild.”

When Tufts researchers looked at nearly 900 men and women in the Framingham Heart Study, those who consumed roughly 250 micrograms of vitamin K a day (largely from food) had a 65 percent lower risk of hip fractures than those who averaged around 55 micrograms a day.

And in another study, of nearly 1,500 Framingham women, those who consumed more than about 200 micrograms of vitamin K a day had greater spine and hip bone density than those who typically ate less than about 100 micrograms a day.

The question is whether it’s vitamin K, something else in leafy greens, or something else about people who eat leafy...
greens that protects their bones. “People who eat leafy greens also eat a healthier diet and lead a healthier lifestyle,” says Booth.

So clinical trials have given women either a placebo or vitamin K (with or without vitamin D) to see if it boosts their bone density. Three trials—testing 200 to 1,000 micrograms of vitamin K per day—have been done so far.9-11

“A Dutch study found less bone loss at the hip, a British study found less bone loss only at the wrist, and a University of Wisconsin study found no effect anywhere,” says Booth. “So the results are inconsistent.”

Two larger studies—one at Tufts and one at the University of Toronto—are due out within the next year. “Together, they’ll have 900 men and postmenopausal women, so that should answer the question,” says Booth.

In the meantime, you can easily get enough vitamin K from greens. “You can get 500 micrograms in just half a cup of cooked collards,” says Booth.

And even if the vitamin K in greens doesn’t make bones denser, the greens may still strengthen your skeleton.

In several studies, people who reported eating more of any fruits and vegetables had higher bone density.12,13 Researchers think that’s because the potassium, magnesium, and other alkaline-forming minerals in produce neutralize acid-forming foods in the body.

“We get acids from the metabolism of foods like meat, some grains, and food additives like phosphoric acid in colas,” says Tufts’ Tucker.

(What matters isn’t whether a food contains acid, but whether it makes the blood more acidic once the food is broken down and absorbed, she adds. Orange juice, for example, contains citric acid but makes the blood more alkaline.)

“If there’s enough potassium, magnesium, and calcium in the diet, those minerals neutralize the acidic compounds,” Tucker explains. “But if there’s not enough alkaline to do the job, the blood gets acidic.”

The body has to keep the acid-base balance in the blood within an extremely narrow range, she adds, “so it takes calcium out of bone to keep the balance.”

Taking calcium from bones is no problem if it happens occasionally. “But if it happens continually, it’s a major contributor to lower bone mineral density,” says Tucker.

**THE BRAIN & BEYOND**

Researchers are hunting down clues that leafy greens may do more. For example:

■ **Memory.** Women who consumed the most leafy greens had less cognitive decline—that is, a smaller drop in memory and other test scores over two years—than did women who consumed the fewest green leafy vegetables.14

■ **Diabetes.** When researchers studied nearly 40,000 female health professionals, they found no link overall with fruits and vegetables. But among overweight women, those who consumed the most green leafy vegetables had about a 15 percent lower risk of diabetes than those who consumed the least.15

■ **Colon Cancer.** Men who consumed the most green leafy vegetables (about two servings per day) had a 14 percent lower risk of colorectal cancer than those who consumed the least (about one serving per week).16

Some researchers think that the chlorophyll in green vegetables may counter the harm caused by heme, the iron-carrying pro-oxidant pigment that gives meat its red color. Feeding heme to rats makes their colon cells proliferate more, but adding either spinach or purified chlorophyll to their diet reverses the damage.17

■ **Stroke.** In a study of more than 75,000 women and 38,000 men, the risk of non-hemorrhagic stroke (which accounts for 80 percent of all strokes in the United States) was about 20 percent lower for every serving of green leafy vegetables people consumed per day, though other vegetables were also linked to a lower risk.18

And if those potential benefits—which need to be confirmed—aren’t convincing, it’s indisputable that leafy greens are a low-calorie, nutritional powerhouse.

“They’ve got vitamin K, potassium, and magnesium, along with antioxidants and other phytochemicals that are not well understood but that may also have protective effects,” says Tucker. “They’re super foods.”

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**Greens with Envy**

Most green leafy vegetables supply not just vitamin K and lutein, but one to three days’ worth of vitamin A and 10% to 20% of a day’s vitamin C and folate. (If you take Coumadin or other blood thinners, ask your doctor to adjust the dose to accommodate the vitamin K in the greens you eat regularly.)

<table>
<thead>
<tr>
<th>Vegetable</th>
<th>Vitamin K (mcg)</th>
<th>Lutein* (mcg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kale</td>
<td>530</td>
<td>11,900</td>
</tr>
<tr>
<td>Spinach</td>
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<tr>
<td>Swiss chard</td>
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<tr>
<td>Collards</td>
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<td>Turnip greens</td>
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<td>Mustard greens</td>
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<tr>
<td>Spinach (1 cup raw)</td>
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<tr>
<td>Dandelion greens</td>
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<td>Beet greens</td>
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<td>Romaine lettuce (1 cup raw)</td>
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<tr>
<td>Boston (Bibb) lettuce</td>
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<td>700</td>
</tr>
<tr>
<td>Parsley (10 sprigs raw)</td>
<td>160</td>
<td>600</td>
</tr>
<tr>
<td>Iceberg lettuce (1 cup raw)</td>
<td>20</td>
<td>200</td>
</tr>
</tbody>
</table>


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**Don’t know your collards from your kale? Wouldn’t be able to identify a beet green if it hit you in the head? See our recipes on p. 12 and at NutritionAction.org.**

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