

# America's PRESSURE Cooker

“Organic” foods are hot. So are “low-sugar,” “whole-grain,” “low-fat,” and “low-calorie” foods, according to industry analysts. But foods that are lower in sodium? Not so hot.

Why don't Americans care about salt? Health officials haven't exactly waged a campaign to warn us about its dangers. The media—perhaps under the food industry's influence—has largely ignored or downplayed its risks. And many people think they can ignore salt because their blood pressure is low, or it's so high that they need drugs anyway.

Whatever the reason, we're eating more salt just when health authorities are urging us to eat less. The Institute of Medicine—independent scientists who advise the government—recently cut the recommended sodium intake from 2,400 milligrams a day to 1,500 mg or less. Most people eat at least 4,000 mg a day. An order of General Tso's Chicken has more than 3,000 mg.

Here's why—and how—to steer clear of salt.

Dallas. “That's about as much as we see with blood pressure medications.”

All told, dozens of studies on thousands of people have reached similar conclusions. “The evidence that links salt intake to blood pressure is now overwhelming,”

says Graham MacGregor of the St. George's Hospital Medical School in London.

A blood pressure drop of just a few points may seem trivial, but it can reduce the chances of having a heart attack or stroke, which increase with every rise in pressure.

“What seems like a relatively small effect on blood pressure at the moment may in the long term prevent the further increase in pressures that occurs with age,” says Kaplan.

## Pressure Creep

In industrialized countries, blood pressure creeps up, millimeter by millimeter, as people age. “The Framingham Heart Study took people who had normal blood pressures at age 55 or 65 and followed them for 20 years,” says Kaplan. “At age 75 or 85, close to nine out of ten had high blood pressure.”

So either your blood pressure is already high or it eventually will be. “The threat of hypertension is pervasive,” says Kaplan. “Just because you have normal blood pressure when you're 40 or 50 or 60 doesn't mean that you can escape hypertension. Anything that slows the process is good for everyone.”

Cutting back on salt may prevent or at least delay that upward creep. “People

The science on salt is more solid than ever. Among the key studies:

■ **The Trials of Hypertension Prevention (TOHP II)** looked at 1,100 moderately overweight, middle-aged adults with pre-hypertension (see “How High is High?”).<sup>1</sup> After three years, those who cut their sodium by 25 percent (by roughly 930 milligrams per day) had blood pressures that were lower (by 1.7 over 0.9 points) than those who weren't told to eat less salt.

■ **The Trial of Nonpharmacologic Interventions in the Elderly (TONE)** tested a lower-sodium diet on almost 1,000 men and women with pre-hypertension who were between the ages of 60 and 80.<sup>2</sup> After 2½ years, those who cut their sodium by about 25 percent had blood pressures that were lower (by 2.6 over 1.1 points) than people who did not.

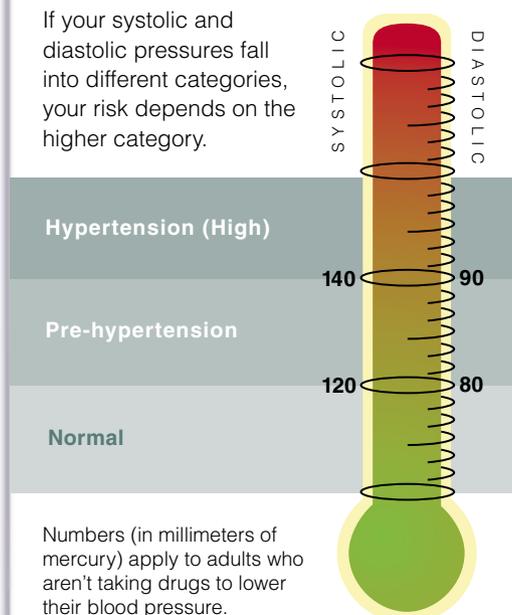
■ **The Dietary Approaches to Stop Hypertension (DASH) trial** fed more than 400 people diets with high levels of sodium (3,300 mg a day), medium levels (2,400 mg), or low levels (1,500 mg) for one month.<sup>3</sup> For those who were eating a typical American diet, going from high to low sodium cut blood pressure the most (6.7 over 3.5 points). For those who were eating a healthier “DASH” diet (packed with fruits, vegetables, and low-fat dairy foods), blood pressure also fell (by 3.0 over 1.6 points). Interestingly, the drop was bigger when they switched from medium to low sodium levels than from high to medium.

Blood pressure falls even more in people whose pressure is already high.<sup>4</sup>

“In people with hypertension, a reduction in sodium to 2,400 mg a day lowered blood pressure by about 5 points over 3 points,” says Norman Kaplan, a hypertension expert at the University of Texas Southwestern Medical Center in

## How High is High?

If your systolic and diastolic pressures fall into different categories, your risk depends on the higher category.



Source: National Heart, Lung, and Blood Institute.

think that hypertension is an inevitable consequence of aging," says the University of Maryland's Stephen Havas. It's not. "High blood pressure is largely caused by excess salt, excess weight, and insufficient exercise and fruits and vegetables. If people watched their diet and exercised, their blood pressure would be much less likely to drift up into the hypertensive range."

In non-industrialized populations that consume very little salt, blood pressure doesn't rise with age.<sup>5</sup> "If you could lock blood pressure in place in your 20s and 30s, we wouldn't have an epidemic," says Eva Obarzanek of the National Heart, Lung, and Blood Institute.

And it's not just a diagnosis of hypertension that matters. The risk of a heart attack or stroke starts to rise long before blood pressure reaches 140 over 90. That's the cut-off for hypertension, the point at which

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## The Salt Sellers

Here's a broad-brush picture of sodium in the supermarket. Since some brands have much less than others, always check the Nutrition Facts panel before you buy.

Food	Sodium (mg)
Barley, oats, pasta, or rice (1 cup cooked)	less than 10
Beans, dried (½ cup cooked)	less than 10
Fruit—fresh, frozen, dried, or canned	less than 10
Fruit juice (1 cup)	less than 10
Nuts and seeds, unsalted (1 oz.)	less than 10
Tofu (3 oz.)	less than 10
Swiss cheese (1 oz.)	50
Mustard, yellow (1 tsp.)	60
Fresh vegetables—raw or cooked	less than 80
Mayonnaise (1 Tbs.)	80
Fresh meat, poultry, or fish (3 oz. cooked)	less than 90
Mustard, Dijon (1 tsp.)	120
Milk (1 cup)	140
Yogurt (6 oz.)	140
Ketchup (1 Tbs.)	170
Cheddar cheese (1 oz.)	180
Potato chips (1 oz.—20 chips)	180
Shrimp, fresh (3 oz. cooked)	190
Canned tuna, drained (2 oz.)	200
Peanuts, dry roasted, salted (1 oz.—30 nuts)	230
Canned chickpeas, drained and rinsed (½ cup)	270
Bread—white or whole-wheat (2 slices)	320
Feta cheese (1 oz.)	320
Raisin bran (1 cup)	350
Dill pickle (1 medium spear)	390
Green olives (5 medium)	410
Cottage cheese (½ cup)	420
Bread—pumpernickel or rye (2 slices)	460
Pretzels (1 oz.—9 thin twists)	560
Salt (1 tsp.)	2,330

Sources: U.S. Department of Agriculture, food companies, and CSPI.

## Want Salt with That?

It's almost impossible to eat out without getting at least 1,000 milligrams of sodium. But if you're careful, you can dodge the dishes with 2,000 to 4,000 mg. That's a teaspoon or two of salt in your lunch or dinner.

Food	Sodium (mg)
McDonald's Fruit & Walnut Salad	90
McDonald's Fruit 'n Yogurt Parfait	90
McDonald's French Fries (large)	330
Einstein Bros. Plain Bagel	520
Salmon, vegetables, baked potato with sour cream	700
Pizza Hut Veggie Lover's Pan Pizza, large (2 slices)	880
Auntie Anne's Original Pretzel	930
Roast beef sandwich with mustard (9 oz.)	990
McDonald's Big Mac	1,010
McDonald's Chicken McGrill	1,010
Burger King Whopper	1,020
Burger King French Fries (King)	1,070
Panera Low-Fat Chicken Noodle Soup (8 oz.)	1,080
McDonald's Quarter Pounder with Cheese	1,150
Tuna salad sandwich (11 oz.)	1,320
Burger King Chicken Whopper	1,410
Turkey sandwich with mustard (9 oz.)	1,410
Au Bon Pain Broccoli Cheddar Soup (12 oz.)	1,440
Au Bon Pain Chicken Salsa Wrap (12 oz.)	1,440
Spaghetti with marinara sauce (3½ cups)	1,450
Chicken Caesar salad with dressing (4 cups)	1,490
McDonald's Chicken Selects (5 pieces)	1,550
Bacon, lettuce, and tomato sandwich (8 oz.)	1,560
Panera Greek Salad with Greek Dressing	1,560
Sbarro Supreme Pizza (1 slice)	1,580
Panera French Onion Soup (8 oz.)	1,810
Baja Fresh Cheese Nachos	1,880
Corned beef sandwich with mustard (9 oz.)	1,920
Baja Fresh Cheese Quesadilla	2,030
Lasagna (2 cups)	2,060
Linguine with red clam sauce (3 cups)	2,180
Chipotle Vegetarian Burrito, with cheese, guacamole, and salsa	2,270
Panera Smokehouse Turkey Panini on Artisan Three Cheese	2,320
Ham sandwich with mustard (9 oz.)	2,340
Buffalo wings with blue cheese dressing (12 wings)	2,460
Szechuan shrimp with rice (3½ cups)	2,460
Chipotle Chicken Burrito, with cheese and salsa	2,490
Pizza Hut Meat Lover's Stuffed Crust Pizza, large (2 slices)	2,500
Chef salad with dressing (5 cups)	2,510
Kung Pao chicken with rice (4½ cups)	2,610
Beef and broccoli with rice (4 cups)	3,150
Reuben sandwich (14 oz.)	3,270
House Lo Mein (4½ cups)	3,460
Chicken fajitas with tortillas (4), with beans, rice, and guacamole	3,660
Cheese fries with ranch dressing (4 cups)	4,890

Sources: U.S. Department of Agriculture, restaurant chains, and CSPI.

doctors consider prescribing blood-pressure-lowering drugs (see “How High is High?” p. 3). But “normal” blood pressure is much lower (120 over 80 or below). “And the best blood pressure may be 115 over 75 or below,” says Kaplan.

For the nation, even a small drop in average blood pressure can have a profound impact on heart attack and stroke rates.<sup>4</sup> “If you lower the blood pressure of the overall population by, say, two millimeters, it would have enormous benefits for reducing deaths from coronary heart disease and stroke,” says Kaplan.

A 50 percent drop in the sodium content of packaged and restaurant foods would lower the average systolic blood pressure by five points, according to estimates by Havas; Claude Lenfant, former director of the National Heart, Lung, and Blood Institute; and Ed Roccella, coordinator of the institute’s National High Blood Pressure Education Program.<sup>6</sup> “That would lead to at least a 20 percent reduction in the prevalence of hypertension, and to roughly 150,000 fewer deaths per year,” Havas notes.

And that figure may underestimate the number of lives saved, because salt may raise the risk of heart attacks and strokes apart from its effect on blood pressure, at least in overweight people.<sup>7</sup>

## Sensitive to Salt

As people age, it’s usually their systolic blood pressure (the higher number) that climbs the most. “Most older people develop isolated systolic hypertension due to the rigidity of clogged arteries,” says Kaplan. “It’s like rust in the pipes.”

The force that blood exerts on the artery wall when the heart beats is called systolic pressure; the force *between* heartbeats is called diastolic pressure. Researchers think systolic pressure rises because partially clogged arteries are stiffer.

“Systolic hypertension has the greatest impact on stroke because the blood is constantly beating against the vessel wall, causing tiny breaks,” Kaplan explains. “That’s where a cholesterol plaque is more likely to develop.”

When a blood clot gets stuck in an artery clogged by plaque, the person has a heart attack (if the

artery feeds the heart muscle) or a stroke (if the artery feeds the brain).

Higher pressure also raises the risk of strokes caused by burst blood vessels in the brain. What’s more, says Kaplan, “elevated systolic pressure puts a load on the heart because that’s the pressure that the heart has to pump against.”

While older people may be more likely to have high blood pressure, age comes with a silver lining: cutting back on salt is more likely to trim their blood pressure. “People get more sensitive to salt as they get older,” says Kaplan.

Years ago, the salt industry convinced millions of consumers that salt had no impact on blood pressure. But most of the studies it cited were flawed.

“The literature had studies in which researchers put people on a salt-restricted diet and then gave them a salt load,” explains Eva Obarzanek of the National Heart, Lung, and Blood Institute. “Then, based on a single measurement of blood pressure, they were classified as salt-sensitive or not.”

Obarzanek’s research shows that it takes many measurements to reach any conclusions about sensitivity, because blood

pressure varies so much from day to day.<sup>8</sup> “There’s such high variability that you’d have to repeat the measurements on many days to see if they’re salt-sensitive,” she says.

And that’s simply impractical. “We just don’t have a feasible way to identify who are the most salt-sensitive and who are the least.” And salt sensitivity is common whether people have hypertension or not.

But the DASH trial and other studies did show that some *groups* are more sensitive to salt than others. “People who were at least 45 years old were more sensitive than those who were younger,” says Obarzanek. So are African Americans.

## Already High

Roughly one out of two people over the age of 60 has high blood pressure. Why should they bother cutting salt if they’re already taking drugs to lower it?

“All blood pressure medications have their effectiveness enhanced by a lower sodium intake,” says Kaplan. “That’s been shown particularly in people taking the most popular drugs—the ACE inhibitors and the angiotensin receptor blockers.” (That includes drugs like Vasotec, Lotensin, Hyzaar, Avapro, and Diovan.)

Most blood pressure drugs (except beta-blockers) are vasodilators—that is, they expand the blood vessels. That lowers the pressure of blood against the artery walls. “But the kidney responds to lower blood pressure by holding on to salt and water so it can keep blood flow constant,” explains Kaplan.

“That fills the blood vessels back up,” bringing blood pressure closer to its unhealthy level. “But if you keep excess salt out of the circulation, the kidney doesn’t hold on to as much salt and fluid, and the pressure stays down.”

Diuretics (like hydrochlorothiazide, or HCT) increase the amount of salt excreted by the kidneys, which is why Kaplan and many other doctors often prescribe them along with other pressure-lowering drugs. But diuretics can only do so much. “If you put enough sodium through the kidneys, the diuretic can’t keep it all from being retained,” he explains.

The bottom line: “The efficacy of blood-pressure-lowering

## What Works?

If your blood pressure is high, here’s how much lifestyle changes should lower it. So far, studies have found that taking calcium, fish oil, or herbal supplements has little or no effect on blood pressure.

Advice	Details	Drop in Systolic Blood Pressure
<b>Lose excess weight</b>	For every 20 pounds you lose	5 to 20 points
<b>Follow a DASH diet</b>	Eat a lower-fat diet rich in vegetables, fruits, and low-fat dairy foods	8 to 14 points
<b>Exercise daily</b>	Get 30 minutes a day of aerobic activity (like brisk walking)	4 to 9 points
<b>Limit sodium</b>	Eat no more than 2,400 mg a day (1,500 mg is better)	2 to 8 points
<b>Limit alcohol</b>	Have no more than 2 drinks a day for men 1 drink a day for women <small>(1 drink = 12 oz. beer, 5 oz. wine, or 1.5 oz. 80-proof whiskey)</small>	2 to 4 points

Source: *The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure* ([www.nhlbi.nih.gov/guidelines/hypertension](http://www.nhlbi.nih.gov/guidelines/hypertension)).

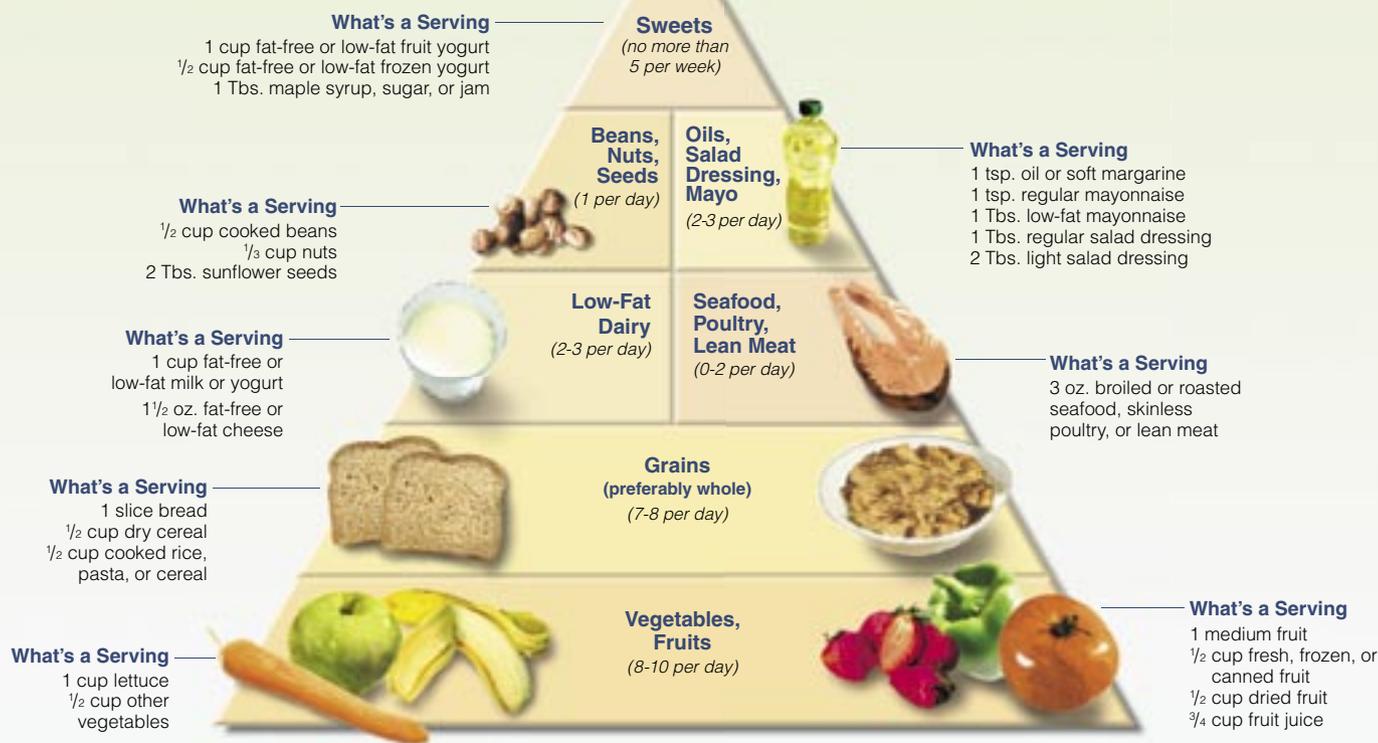
# A DASHing Pyramid

Here's how the DASH diet would look if it took the shape of a pyramid. If you want to follow it, make sure you pay attention to the rather small serving sizes.

A serving of grains, for example, is just half a cup of cereal, pasta, or rice or a one-ounce slice of bread. That's far less than a typical bagel (four or five ounces), a serving of most

cereals (one cup), or a restaurant-size serving of spaghetti (about three cups). Servings of seafood, poultry, meat, oils, fruits, and vegetables are also petite.

If you think you'd starve on this diet, remember that it's for someone who eats 2,000 calories a day. Many men are likely to need closer to 2,500 calories.



Choose salt-free or low-salt foods from all categories.

drugs—how well they work—is doubled on a lower-sodium diet,” says Kaplan.

What's more, cutting sodium can get some people with high blood pressure off drugs entirely. When researchers in the TONE study took 975 older people off hypertension drugs and had them cut sodium by 1,000 mg a day, half were able to keep a normal blood pressure without drugs for the rest of the 2½-year study.<sup>2</sup> “Lowering sodium intake diminished the return of hypertension,” says Kaplan.

“For someone who has high blood pressure, you can get almost as much impact by cutting sodium as you can from prescribing a single drug,” says the University of Maryland's Stephen Havas. “When I had a medical practice, I was able to control blood pressure without drugs in about half of my hypertensive patients.”

And that was before anyone knew that a DASH diet—which trims saturated fat and cholesterol and boosts fruits, vegeta-

bles, and low-fat dairy foods—could also lower blood pressure. “If I had had the arsenal that's now available, it would have been even easier to keep people off drugs,” says Havas.

## What's Up, Doc?

Why don't physicians try harder to change their patients' diets instead of just prescribing drugs?

“They're convinced that people won't adhere to a diet,” says Havas, who has taught medical students for 20 years. “They don't realize that roughly half of people who are prescribed drugs to lower blood pressure, blood cholesterol, and blood sugar decide to stop taking them within a year.”

In most cases, it's not side effects that are to blame. Rather, “people don't understand that hypertension is a lifetime condition,” says Havas. “It's hard to keep taking a drug once you feel fine, and except for

the diuretics, the drugs are expensive.”

Yet physicians don't push lower-salt diets. “Most doctors do a lousy job at lifestyle counseling,” says Havas. “They think it takes a large amount of time and people won't want to change. And people *won't* change if doctors don't help.”

What's more, physicians don't know how to teach people to avoid salt. “They have no idea that three-quarters of our sodium comes from processed and restaurant foods, not from the salt shaker,” says Havas. “Doctors are a major source of health advice, and if they don't know about salt, their patients won't get the message. In fact, you don't need much training, just some passion.”

Misinformation also explains why many Americans aren't worried about eating too much sodium. “Most consumers think they've taken care of the problem because they don't add salt when cooking

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or at the table," says Havas. "So salt is low on their priority list."

## Swing Low

The latest report from the Institute of Medicine recommends only 1,500 mg of sodium a day, less (1,300 mg) for people in their 50s and 60s, and even less (1,200 mg) for anyone over 70.

That's low.

The average American eats about 4,000 mg of sodium a day. Dropping down to 1,500 mg is possible, but only if you avoid most processed foods and choose everything else carefully. And it's almost impossible to eat out unless you order unsalted poultry, seafood, or meat with a baked potato and salad (with oil and vinegar). Many Chinese, Indian, Italian, Mexican, Thai, and other ethnic dishes would use up more than the entire 1,500 mg in one meal (see "Want Salt with That?" p. 5).

But that doesn't mean you should throw

up your hands and forget about salt.

"Even though we think that it would be best to lower sodium in the diet to 1,500 mg," says Kaplan, "we have to face the reality that we are living in an industrialized, commercialized world where average sodium consumption is high because food processors have been putting so much salt in our food."

"Cutting down is the main message," he adds. "How low one can go may be less important than trying to start the process of getting excess salt out of the diet."

Since so much salt comes from processed foods, the solution is to get food companies to take it out. "People should shoot for 1,500 mg a day," says Havas. "But 2,300 mg is fine as an interim target until the food supply changes. The greatest culprit now is the Food and Drug Administration, for not pushing the food industry to reduce sodium."

At least *one* government is doing more. British authorities have publicly embarrassed more than two dozen companies,

including Heinz, McDonald's, and Nestlé, for failing to draw up adequate plans to cut salt in their foods.

"There's a whole range of sodium in foods," says Havas. "The British government is telling companies that they need to at least be at mid-level."

Britain has launched a major public health campaign—using Sid the Slug—to warn people about salt's dangers. "The government might even require foods to be labeled 'high in salt,'" adds Havas.

In the U.S., the Center for Science in the Public Interest (publisher of *Nutrition Action Healthletter*) has sued the Food and Drug Administration, trying to force it to classify salt as a food additive, rather than an ingredient that is "Generally Recognized As Safe."

Until sodium levels in foods fall, people can drive down their blood pressure by eating a DASH diet (see "A DASHing Pyramid," p. 7). "We don't know which features of the DASH diet are responsible," says Kaplan, "but increasing fruits and vegetables and lowering fat can help."

Researchers *do* know that potassium, which is abundant in the DASH diet, accounts for some of the diet's impact on blood pressure. Potassium seems to keep sodium from raising blood pressure by making the kidneys excrete more salt.

"If you give people an extra few grams of potassium, it can lower blood pressure by three or four points," says Kaplan. "But potassium can cause stomach irritation if you get it in a salt substitute," he adds. It's better to get it from potassium-rich foods (see "The Sodium Antidote").

In other words, snacking on a banana instead of a bag of pretzels can kill two birds (more potassium and less sodium) with one food. And the DASH diet may polish off a few other birds. It can also lower LDL ("bad") cholesterol and boost bone density.<sup>9,10</sup>

The key is to cut sodium whenever and wherever you can. "We don't want to interfere with the enjoyment of food," says Kaplan. "But avoiding heavily salted food is a reasonable thing for everyone to do." 🍌

## The Sodium Antidote

Potassium isn't a household name, but it oughta be. It helps neutralize sodium's effect on blood pressure. It also seems to lower the risk of stroke apart from its effect on blood pressure. And it helps prevent kidney stones and the bone loss that can lead to osteoporosis.

Unfortunately, we don't get enough potassium. Experts recommend 4,700 milligrams a day. The typical American man gets roughly 3,000 mg; the typical woman closer to 2,300 mg. The answer isn't the potassium chloride in supplements or salt substitutes, since that form doesn't help bones and stones. Instead, you can get what you need from the naturally occurring potassium in foods like these.

Food ( <i>1/2 cup cooked vegetable, fruits raw</i> )	Potassium (mg)	Food	Potassium (mg)
Potato (1)	940	Pistachios (1 oz.—50 nuts)	300
Sweet potato (1)	540	Flounder (3 oz. cooked)	290
Banana (1)	490	Parsnips	290
Halibut (3 oz. cooked)	490	Pinto beans, canned ( <i>1/2 cup</i> )	290
Lima beans	490	Beef (3 oz. cooked)	270
Fresh tuna (3 oz. cooked)	480	Wheat germ (2 Tbs.)	270
Swiss chard	480	Brussels sprouts	250
Acorn squash	450	Prunes (4)	250
Spinach	420	Orange (1)	230
Salmon (3 oz. cooked)	390	Zucchini	230
Cantaloupe ( <i>1/4 melon</i> )	370	Artichokes	220
Lentils ( <i>1/2 cup cooked</i> )	370	Almonds (1 oz.—20 nuts)	210
Milk (1 cup)	370	Chickpeas, canned ( <i>1/2 cup</i> )	210
Watermelon (2 cups)	320	Collard greens	210
Grapes (1 cup)	310	Chicken (3 oz. cooked)	200
Pork (3 oz. cooked)	310	Peanuts (1 oz.—30 nuts)	190
Raisins ( <i>1/4 cup</i> )	310	Tuna, canned (2 oz.)	130

<sup>1</sup> *J. Human Hypertens.* 19: 33, 2005.

<sup>2</sup> *J. Amer. Med. Assoc.* 279: 839, 1998.

<sup>3</sup> *New England Journal of Medicine* 344: 3, 2001.

<sup>4</sup> *Hypertension* 42: 1093, 2003.

<sup>5</sup> *BMJ* 297: 319, 1988.

<sup>6</sup> *Amer. J. Public Health* 94: 19, 2004.

<sup>7</sup> *J. Amer. Med. Assoc.* 282: 2027, 1999.

<sup>8</sup> *Hypertension* 42: 459, 2003.

<sup>9</sup> *Hypertension* 43: 393, 2004.

<sup>10</sup> *J. Nutr.* 133: 3130, 2003.