

# Nutrition *Action*

JANUARY/FEBRUARY 2014 \$2.50

HEALTH LETTER®  
CENTER FOR SCIENCE IN THE PUBLIC INTEREST

## TROUBLE AHEAD?

### HOW TO KEEP YOUR BRAIN SHARP

BY BONNIE LIEBMAN

**A**lzheimer's and other dementias are the sixth leading cause of death in the United States. They strike one in three people aged 85 or older.

Most survive for four to eight years after they're diagnosed, much of that time in a nursing home.

As baby boomers age, the cost of caring for people with Alzheimer's and other dementias is expected to double by 2040. It's already \$157 to \$215 billion a year.

Needless to say, researchers are scrambling to find measures to prevent, or even delay, dementia.

*Continued on page 3.*



MEMO FROM MFJ

# We're 40!



**A** long, long time ago—July 1973, to be exact—I attended a meeting of the Society for Nutrition Education. To foment a little trouble and draw out the more activist educators, I circulated a petition calling for a

resolution on some motherhood and apple pie issue. I don't remember if the resolution passed, but I collected a few hundred signatures.

When I returned to Washington, I thought it would be useful to connect those petition signers, and so, in January 1974, *Nutrition Action* was born. It was a homespun affair—just eight pages—but people liked it. They told their friends, who told their friends, and over the next year the circulation grew to about a thousand.

*Nutrition Action* was getting expensive to staff (Patricia Hausman was our stalwart editor), print, and mail, so we took a gamble and started charging. Remarkably, people paid! Many of the early issues focused on the government's food and nutrition policies, but in the early 1980s our astute new editor (Greg Moyer) had a brilliant idea: publish articles not just on what we wanted to tell readers, but also on what our readers wanted to hear.

Over the next decade or so readership soared, reaching more than a million subscribers in 1997 (including some 40,000 from the Canadian edition that we launched in 1996). And we became far more professional about how we obtained—and kept—subscribers (thanks mostly to Dennis Bass). Circulation eventually leveled off at around 800,000, though we're expecting to cross

the million mark again early this year.

One of *Nutrition Action's* strengths is that it has been staffed by dedicated people who are devoted to providing reliable information not colored by commercial considerations or political views. We stick to the science.

Our entire staff deserves credit for maintaining the publication's credibility and liveliness—especially nutrition director Bonnie Liebman (keeping our facts straight since 1977), editor Stephen Schmidt (ensuring readability and humor since 1988), nutritionist Jayne Hurley (our restaurant and food maven since 1988), and nutritionist David Schardt (our expert on, among other things, dietary supplements since 1992).

But it's far from a one-way street. Over the years, *Nutrition Action* subscribers have made thousands of calls and sent thousands of letters and e-mails to food companies and government agencies.

So every time you read a package's Nutrition Facts label, you can thank yourself (double thanks if you've become a donor!). And you can thank yourself for helping rid the food supply of trans fat, getting healthier foods into schools, and more. (To get in on future pats on the back, sign up for our action alerts at [my.cspinet.org](http://my.cspinet.org).)

But enough about the last 40 years. It's time to deliver to you another issue of *Nutrition Action Healthletter*. As always, we hope you read it in good health.

Michael F. Jacobson, Ph.D.  
Executive Director  
Center for Science in the Public Interest



Volume 1, Number 1.

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*Nutrition Action Healthletter* (ISSN 0885-7792) is published 10 times a year (monthly except bi-monthly in Jan./Feb. and Jul./Aug.) by The Center for Science in the Public Interest (CSPI), 1220 L Street NW, #300, Washington, DC 20005. Periodicals postage paid at Washington, DC and additional mailing offices.

POSTMASTER: Send address changes to *Nutrition Action Healthletter*, 1220 L Street, NW, Suite 300, Washington, DC 20005.

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# TROUBLE AHEAD?

## HOW TO KEEP YOUR BRAIN SHARP

So far, no one has found a magic bullet to stop Alzheimer's disease, which gums up the brain with protein clumps and tangles. But it's not just clumps and tangles.

### Brain Basics

Plaques and tangles. Those are the classic hallmarks of Alzheimer's disease.

The plaques are clumps of a protein fragment called beta-amyloid. The tangles are clusters of misshapen "tau" proteins that show up later in the disease.

But plaques and tangles alone don't explain what happens to many aging brains.

"Thirty percent of people over the age of 70 have elevated beta-amyloid and are cognitively normal," says David Knopman, professor of neurology at the Mayo Clinic in Minnesota.

Scientists aren't sure why.

"The most prevalent idea is that amyloid deposits are only the initiating step in a chain of events that includes neurofibrillary tangles that damage neurons and synapses," says Bruce Reed, associate director of the University of California Davis Alzheimer's Disease Research Center. Synapses connect one neuron (nerve cell) to another (see illustration).

"It's the damage to and loss of synapses that causes the cognitive symptoms," adds Reed.

So amyloid alone may not cause problems if the disease is in its early stages.

"It's maybe ten years or more between the time when amyloid deposition begins and even mild symptoms begin, and maybe 15 to 20 years before dementia develops," says Reed.

But Alzheimer's isn't the only cause of dementia.

"When we look at the cause of dementia in older people, we too

often assume that it's just Alzheimer's," notes Reed. "But it's uncommon to find people with dementia who just have a single pathology. Very often, it's mixed pathology."

Damage to the brain's blood vessels—often due to high blood pressure, smoking, or diabetes—can also play a role, not just in dementia but in milder memory loss as well.

Here's how to keep a clear head for as long as possible.

The most common other problem: damaged blood vessels in the brain.<sup>1,2</sup>

"The arteries become stiffened, narrowed, and sort of tortuous," says Reed. "It's much harder for the blood flow to occur normally."

That can lead to a stroke that's obvious, or to one that's never noticed. "Around 20 percent of older people have had a so-called silent stroke and don't know it," says Reed. "Cerebrovascular disease is extremely common."

It also contributes to mild cognitive impairment, or MCI, adds Reed. (People with MCI often go on to develop dementia.)

"In fact, some of the symptoms we think of as normal brain aging may be due to injury to the brain's blood vessels," he notes.

Researchers know the major threats. "The big risks for vascular brain injury are smoking, high blood pressure, and diabetes," says Reed.

The causes of Alzheimer's pathology are more murky. But new evidence suggests that insulin may play a role.

Here's how to keep your brain in good working order.

### 1. Watch your blood pressure

"There's a wealth of evidence that high blood pressure is a risk factor for late-life cognitive impairment," says Knopman.

For example, people who have high blood pressure in their 50s or 60s have a higher risk of dementia or cognitive decline when they're older.<sup>3,4</sup>

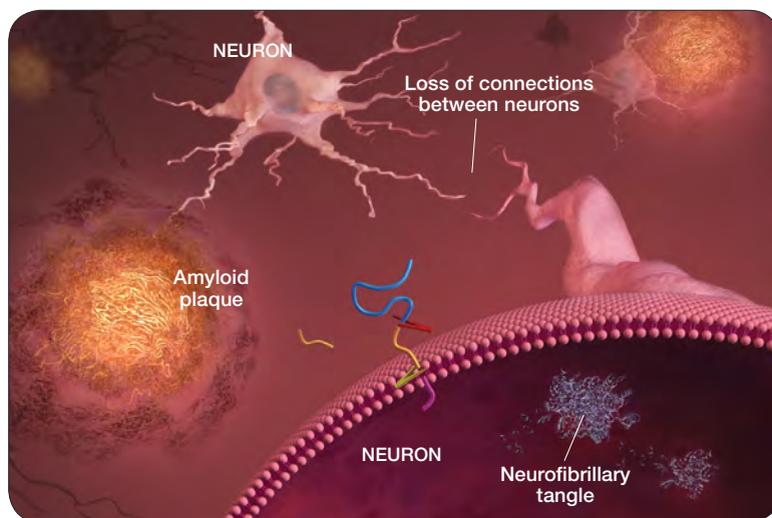
The latest evidence comes from abnormalities seen on brain scans:

■ **Small strokes.** When the blood supply gets cut off, a small area of brain tissue can die from lack of oxygen. That's a small stroke (researchers call it an "infarct").

"It turns out that if people have a big stroke, they almost always have had the small strokes too," says Knopman.

"But many people who have not had big strokes nonetheless have clear evidence of having had smaller strokes." Some are visible on MRI scans, but others are only visible with a microscope during an autopsy.

And smaller strokes matter. For example, among



**Alzheimer's disease.** Excess beta-amyloid may trigger a chain of events that includes tangles of tau protein and, eventually, damage to the synapses that connect nerve cells (neurons).

>>>>

men in the Honolulu-Asia Aging Study who did not have dementia, those with the most micro-infarcts on autopsy had the lowest scores on cognitive tests before they died.<sup>5</sup>

“Many researchers feel that the micro-infarcts that happen silently are what drives cognitive impairment due to vascular disease,” explains Knopman. “And that vascular disease is driven especially by hypertension and diabetes.”

#### ■ White matter hyperintensities.

If an MRI of your brain shows areas with extremely bright white matter, you have a higher risk of cognitive decline.<sup>6</sup>

The brightness may mean that brain tissue is damaged. “Presumably, the connections between nerve cells are compromised, so the regions of the brain can’t communicate well,” explains Knopman.

“If you do scans of people over the age of 65, you find that all of them have a little bit of white matter hyperintensity. But only a few, who almost always have high blood pressure, have a higher burden.”

The good news: you can lower your blood pressure with diet, exercise, weight loss, and, if necessary, medication (see “The Bottom Line,” p. 7).

## 2. Cap blood sugar & insulin

Diabetes also takes a toll on the brain.<sup>7,8</sup>

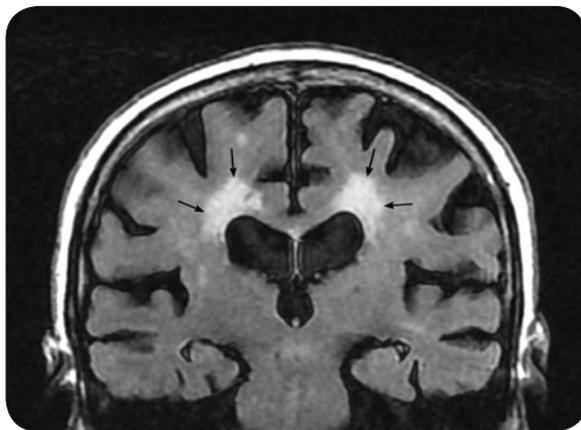
“Type 2 diabetes is a very strong risk factor for dementia,” says Jae Hee Kang, assistant professor of medicine at Harvard Medical School and the Brigham and Women’s Hospital in Boston. “Some people call Alzheimer’s disease type 3 diabetes.”

(In type 1 diabetes, blood sugar soars because the body makes no insulin, the hormone that acts like a key to allow sugar into cells. In the more common type 2 diabetes, blood sugar soars because insulin no longer works properly—that is, people are insulin resistant.)

“There’s no question that diabetes damages small blood vessels,” says Knopman.

It may also shrink parts of the brain. A recent study found more brain atrophy in 350 people with diabetes than in 363 people without the disease.<sup>9</sup>

It’s not just those with diabetes who are at risk. People who have what doctors call “metabolic syndrome” also have a higher



Hyperintensities in the brain’s white matter and small strokes contribute to memory loss.

risk of cognitive decline.<sup>10</sup> That’s roughly one out of three U.S. adults.

Their blood sugar levels are higher than normal, but not high enough to be diabetes. That gives them an increased risk of dementia.<sup>11</sup>

And they may have high blood insulin levels because obesity—especially an oversized waist—has made them insulin resistant. (When insulin doesn’t work well, the pancreas responds by pumping out more.)

That may also spell trouble for the brain.<sup>12</sup> Men with high blood insulin levels declined more on cognitive tests over three years than those with lower levels.<sup>13</sup>

Why would high levels of insulin in the blood matter?

“High insulin in the body means lower insulin in the brain,” says Angela Hanson, a physician and senior fellow at the University of Washington School of Medicine.

That’s because, over time, high levels of insulin in the blood may shrink the number of receptors for insulin in the blood-brain barrier, allowing less to enter the brain, says Hanson. And insulin may help keep the brain healthy (see “Insulin, by a Nose”).

“Insulin helps clear toxic beta-amyloid out of the brain,” Hanson explains. “So if you put someone on a diet that increases brain insulin, you might have less of the toxic amyloid around.”

The key to lowering sugar and insulin in the blood—and presumably raising

insulin in the brain—is to lose excess weight and exercise more.

But one pilot study suggests that it’s not just *how much*, but *what* you eat that matters.

Hanson and her colleagues assigned 20 older adults without mild cognitive impairment and 27 older adults with MCI to eat one of two diets.<sup>14</sup> The LOW diet was low in saturated fat, and its carbs had a low glycemic index—that is, they didn’t cause a bump in blood sugar. The HIGH diet was high in saturated fat, and its carbs had a high glycemic index.

The HIGH diet was unusually high in saturated fat and sugar, but it wasn’t off the charts. “If you look at a fast-food combo meal, it’s got a sugary soda and a high-fat burger,” notes Hanson.

After four weeks, people who got the HIGH diet had higher levels of unbound beta-amyloid fragments in their cerebrospinal fluid (which bathes the brain and spinal cord), while people who ate the LOW diet had lower levels.

“The theory is that the beta-amyloid that’s not bound to fats or other lipids is free, and it’s free to wreak havoc, if you will,” says Hanson. “We believe it’s a more toxic form of beta-amyloid because it’s less likely to be cleared. But that’s hard to test in humans.”

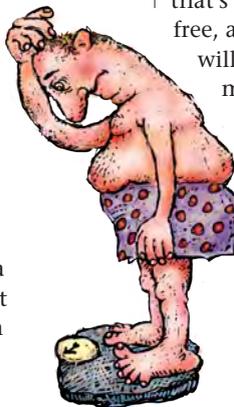
The results seemed to fit with a finding from a similar, earlier study: the LOW diet raised insulin levels in cerebrospinal fluid (and presumably the brain), while the HIGH diet lowered insulin levels.<sup>15</sup>

“A Western diet or obesity or other things that cause high blood insulin may decrease brain insulin,” says Han-

son. “If you make someone less insulin resistant with weight loss or a diet, they may have more brain insulin.”

Until more studies are done, it’s too early to know if a diet lower in saturated fat and sugars can protect the brain. But the research is encouraging.

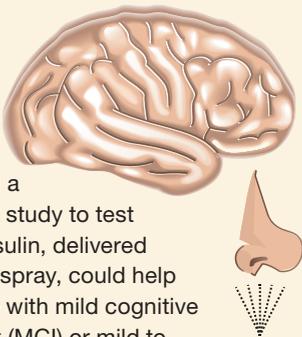
“The most striking finding from these studies was that you could change the brain chemistry of people who have mild cognitive impairment,” says Hanson.



Got a big waist? That could be a sign of high blood insulin levels, which may mean that your brain is losing its edge.

## Insulin, by a Nose

In May 2012, the National Institutes of Health announced a \$7.9 million study to test whether insulin, delivered via a nasal spray, could help 240 people with mild cognitive impairment (MCI) or mild to moderate Alzheimer's.



Suzanne Craft, the trial's chief investigator, has spearheaded research on insulin and the brain, first at the University of Washington and now as professor of internal medicine-geriatrics at the Wake Forest University School of Medicine in North Carolina.

It all started when Craft and her colleagues studied people with prediabetes. "These folks had very high insulin levels in their blood," says Laura Baker, an associate professor of internal medicine-geriatrics at Wake Forest. "But there were very low levels in their brain."

That observation led the researchers to try raising insulin in the brain with a nasal spray. "If you administer insulin through the nose, it has direct access to the brain," explains Baker. "The strategy was to see if that might have a therapeutic effect on memory and thinking."

So far, in pilot trials lasting up to four months, intranasal insulin has boosted

scores on cognitive tests in people with MCI or early Alzheimer's.<sup>1-3</sup> The new national trial is going to last 18 months.

There's good reason to think that insulin affects memory.

"Insulin has receptors in the brain, and they're localized in areas that are vulnerable and are quite important for the formation of brand new memories," says Baker. "When these insulin receptors are diminished, you see memory impairments."

What's more, insulin may help the brain in other ways.

"The new study will look at how insulin affects beta-amyloid, how it affects inflammation, and how it affects cortisol," says Baker.

"Cortisol is involved in the stress response in the brain, and it's very sensitive to changes in insulin," she explains. "If you're stressed, your blood insulin levels skyrocket."

Much of the research on Alzheimer's targets beta-amyloid, says Baker. "Using intranasal insulin is a radically different approach," she adds.

"We see all of these patients day after day. It keeps us honest about what needs to happen. These people need something desperately, and they want to try anything. So we're hopeful."

<sup>1</sup> *Neurol.* 70: 440, 2008.

<sup>2</sup> *Arch. Neurol.* 69: 29, 2012.

<sup>3</sup> *J. Clin. Endocrinol. Metab.* 97: 366, 2012.

"When I'm in my clinic, I can tell patients with MCI that if they eat a healthier diet and exercise, things might get better. That's the message that keeps me going."

### 3. Get moving

In 1999, Arthur Kramer, then at the University of Illinois, reported that healthy sedentary people aged 60 to 75 did better on tests requiring executive function if they were assigned to six months of daily walking than if they were assigned to six months of stretching.<sup>16</sup> (Executive function is the ability to plan or make decisions, correct errors, or react to new situations.)

"That was a historic moment because he showed that a behavioral intervention

could actually change cognition for an aging individual," says Laura Baker, associate professor of internal medicine-geriatrics at the Wake Forest University School of Medicine in North Carolina.

"That catapulted many other trials, and it got people to ask whether exercise might be beneficial not only for body function but also for brain health."

And it led researchers to question whether exercise could help people who were just starting to suffer memory loss.

"I thought, 'Well, if this is working for healthy older adults,

can aerobic exercise have cognitive benefits for someone with a mild cognitive impairment?'" recalls Baker.

In a 2010 study, she assigned 33 people aged 55 to 85 who had mild cognitive impairment to either high-intensity aerobic exercise or stretching.<sup>17</sup> After six months, the women assigned to exercise did better on multiple tests of executive function, while the men improved on only one.

And in a trial of 28 men and women with prediabetes—which is a risk factor for cognitive decline and dementia—aerobic exercise improved executive function, though not memory tests.<sup>18</sup>

"Now we're doing a study on people with mild cognitive impairment and prediabetes, so these people have a double hit risk for dementia," notes Baker. "And, so far, we're seeing the same benefit."

Her results fit with those from similar studies and with other evidence.<sup>19,20</sup>

"Most studies find a lower risk of dementia over time for people who exercise or are lifelong exercisers versus those who don't," says Baker. "Collectively, this work has set the stage for a new trial that will start in July."

The study will test 300 sedentary older people with MCI. "It will be a 12-month supervised high-intensity aerobic exercise intervention at ten different sites, and an extra six months where people continue to exercise unsupervised," explains Baker.

"That's because we're trying to see if we can translate the program for community consumption at agencies like the YMCA."

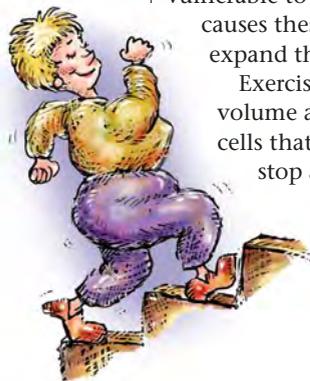
How might exercise protect the brain? One target is microscopic blood vessels.

"If you're sedentary, blood doesn't get to the far reaches of those small vessels," says Baker. "These are the areas that support the kind of executive function that's vulnerable to aging. In animals, exercise causes these small vessels to grow and expand their reach."

Exercise may also expand brain volume and protect the endothelial cells that line blood vessels. But why stop at one explanation?

"What's so beautiful about exercise is that it affects insulin, blood flow, mood, stress level, physiologic stress, and more," says Baker. "Here we have this inter-

vention that affects



**Brisk walking or other aerobic exercise may keep your brain in shape.**



many different systems that all work together to support brain health.”

#### 4. Use it or lose it

Cognitive reserve. That’s what researchers call a lifetime’s worth of using your noggin.

Many studies find a lower risk of dementia in people with more education, more literacy, professional or managerial occupations, and more involvement in mentally stimulating activities (like reading, playing games, or attending classes).<sup>21</sup>

In a recent study, researchers at the Baltimore Longitudinal Study of Aging tracked 239 people (average age: 57) for eight years.<sup>22</sup> All had normal cognition, and most had a close relative with Alzheimer’s.

The scientists used an adult reading test, along with the participants’ vocabulary and years of education, as a measure of cognitive reserve.

Those who had a higher cognitive reserve had a lower risk of Alzheimer’s symptoms, regardless of their beta-amyloid levels. However, cognitive reserve was less protective in people with high levels of tau, a sign of more advanced disease. So brain power isn’t a cure-all.

But it helps. “People who have better intellectual activity are somehow protected against the dementia of Alzheimer’s,” says the Mayo Clinic’s David Knopman. “They may not be protected from the brain disease itself, but they’re protected from the onset of symptoms.”

#### Too Early to Say

■ **Sleep.** It’s clear that mice need their sleep. When scientists allow mice that have been bred to have Alzheimer’s to sleep only four hours a night, they get worse.<sup>23</sup>

“Sleep restriction leads to a faster accumulation of the toxic protein beta-amyloid,” says Andrew Lim, assistant professor of neurology at the University of Toronto.

And researchers at the University of Rochester in New York recently reported that when mice sleep, the space between their brain cells expands from 14 percent of the brain’s volume to 23 percent, which may make it easier for toxic waste products and beta-amyloid to get flushed out of the brain.<sup>24</sup>

“So when animals are deprived of sleep or their sleep is disrupted, less gets cleared,” says Lim.

Whether sleep does similar housekeeping in the human brain is harder to investigate, but researchers are finding clues.

For example, Lim measured nighttime awakenings in nearly 700 older adults without dementia, including some who had a version of the APOE gene that raises Alzheimer’s risk.<sup>25</sup>

“Among people with the high-risk version of the APOE gene, those who had less interrupted sleep had fewer tau tangles and a lower risk of Alzheimer’s,” says Lim.

“This suggests the possibility that,

especially in the roughly 20 percent of the population with the high-risk version of the APOE gene, having uninterrupted sleep may protect against the future risk of Alzheimer’s.”

But it’s still not clear if inefficient or interrupted sleep causes dementia or if dementia disrupts sleep. “We would need randomized trials to be sure,” says Lim.

■ **Caffeine.** Caffeine may protect your brain. “In our study of people who already had an increased risk of cognitive decline because of cardiovascular risk factors, consuming about 500 milligrams of caffeine a day was strongly associated with memory preservation,” says Harvard’s Jae Hee Kang.

“It seems to require high levels of caffeine—four or five cups of coffee a day.” (That’s if it’s Maxwell House or Folgers. At Starbucks, you get 415 mg of caffeine in one venti and 520 mg in two tall coffees.)

The study found no lower risk among people who drank decaf or cola or tea, possibly because they got less caffeine.<sup>26</sup>

Until a trial tests caffeine against a placebo, though, it’s not clear that it protects the brain. Even so, researchers have some reason to expect that caffeine may help.

“In mice that are bred to get Alzheimer’s, caffeine can reduce or reverse the amyloid burden,” says Kang.

Another possibility: “Caffeine seems to be protective for depression, which also increases the risk of dementia.”<sup>27</sup>

■ **Berries.** Blueberries can help aging rats find their way through a maze. Could they also help human brains?

“In our study of 16,000 women aged 70 or older, those who consumed at least one serving of blueberries or two servings of strawberries a week had a slower rate of memory decline over four years than those who consumed hardly any,” says Kang.<sup>28</sup>

“But the effect was modest,” she adds. And no other large studies have looked.

■ **Vitamin D.** Studies find that people with lower blood levels of vitamin D have a higher risk of dementia. “But lower blood levels could



## What to Eat

To keep a lid on your blood pressure and blood sugar, eat a diet that’s based on the OmniHeart and DASH studies (see *NAH*, Oct. 2009, p. 1). It’s rich in vegetables, fruit, and fiber, and low in sugar, carbs, and saturated fat. A 2,100-calorie diet should have:

	Servings
 <b>Vegetables &amp; Fruit</b> (½ cup, 1 cup greens, 1 piece fruit)	11
 <b>Grains</b> (½ cup pasta or rice or cereal, 1 slice bread)	4
 <b>Low-fat Dairy</b> (1 cup milk or yogurt, 1½ oz. cheese)	2
 <b>Legumes &amp; Nuts</b> (½ cup beans, ¼ cup nuts, 4 oz. tofu)	2
 <b>Poultry, Fish, Lean Meat</b> (¼ lb. cooked)	1
 <b>Oils &amp; Fats</b> (1 Tbs.)	2
 <b>Desserts &amp; Sweets</b> (1 tsp. sugar, 1 small cookie)	2
 <b>Wild Card</b> Poultry, Meat, Fish OR Oils & Fats OR Grains OR Desserts & Sweets	1

## Forget About It

Don't rely on these supplements to keep your memory intact.

be a consequence of the disease, because people with cognitive decline may stay at home," says Kang. That means they're not making vitamin D from sunlight.

"We found that women in their 60s with higher vitamin D levels had better cognitive function ten years later," adds Kang.<sup>29</sup> "But few studies have done that, so the evidence is still preliminary."

The VITAL trial, which is randomly assigning people to take vitamin D (2,000 IU a day) and/or fish oil for five years should offer answers.

"We'll be evaluating brain health in the 3,000 oldest participants," says Kang.

■ **Mediterranean diet.** "Our study didn't find a lower risk of cognitive decline in people who eat a Mediterranean diet, but others have," says Kang.<sup>30,31</sup>

But even if all studies agreed that a diet that's low in saturated fat and rich in fruits, vegetables, whole grains, fish, nuts, and olive oil were protective, it would be hard to know if it's the diet—or something else about the people who eat it—that matters.

"I'm a bit hesitant to say that the Mediterranean diet is good for cognitive health," says Kang. "But there's something to be said for an overall heart-healthy diet because cardiovascular health is a risk factor."

### The Bottom Line

#### TO PRESERVE YOUR MEMORY:

- Lose (or don't gain) excess weight
- Exercise 30 to 60 minutes a day
- Eat a healthy diet (see "What to Eat")
- Control blood pressure with diet, exercise, and, if necessary, medication
- Stay mentally and socially active

#### IT MIGHT ALSO HELP TO:

- Get enough sleep
- Eat more seafood and berries
- Get enough vitamin D
- Consume more caffeine

#### DON'T EXPECT MUCH PROTECTION FROM:

- B vitamins
- Vitamins C and E and beta-carotene
- Multivitamins

■ **B vitamins.** In 20 trials that randomly assigned people to take high doses of three B vitamins (folic acid, B-6, and B-12) or a placebo, not much happened.

In the Women's Antioxidant and Folic Acid Cardiovascular Study on 5,442 people at high risk of heart attack or stroke, for example, the B vitamins had no effect on memory.<sup>1</sup> They did seem to help women who got low levels from their food, though the study wasn't designed to answer that question.

"It's critically important for brain health to ensure that one is not deficient in folate, B-12, and B-6," says Harvard's Jae Hee Kang. "However, for most people, who have adequate intakes, B vitamin supplements are unlikely to help."

■ **Antioxidant vitamins.** Taking high doses of vitamin E (600 IU every other day), beta-carotene (83,333 IU every other day), and vitamin C (500 mg a day) for nine years had no impact on memory or cognition in 2,824 women at high risk

of cardiovascular disease.<sup>2</sup>

"In one of our trials, men who took beta-carotene for about 18 years did have a benefit," notes Kang.<sup>3</sup> But in other trials, high doses raised the risk of lung cancer in smokers or former smokers. So it's not worth the risk even if you've never smoked.

■ **Other supplements.** In nearly 6,000 men participating in the Physicians' Health Study, those who took an ordinary multivitamin for seniors (Centrum Silver) for 12 years did no better on cognitive tests than those who took a placebo.<sup>4</sup>

And studies have largely come up empty on phosphatidyl serine, vinpocetine, huperzine-A, and ginkgo, which are often added to "memory" supplements (see *Nutrition Action*, Sept. 2012, p. 9).

<sup>1</sup> *Am. J. Clin. Nutr.* 88: 1602, 2008.

<sup>2</sup> *Circulation* 119: 2772, 2009.

<sup>3</sup> *Arch. Intern. Med.* 167: 2184, 2007.

<sup>4</sup> *Ann. Intern. Med.*, in press.

■ **Fish.** In a study of nearly 6,000 women, those who reported consuming tuna or dark-meat fish (salmon, mackerel, sardines, herring, trout, or swordfish) at least once a week had better verbal memory four years later than women who reported eating those fish less than once a week.<sup>32</sup> Other fish or shellfish had no effect.

"Short-term trials on DHA or EPA—the omega-3 fats in fish oil—"haven't shown any benefit in people with dementia," notes Kang. "A few Japanese trials in people with mild cognitive impairment are tantalizing, but the large VITAL trial has better statistical power to look at fish oil and brain health."

Until the results are in—VITAL is testing 1,000 mg a day of DHA plus EPA—"eating one or two servings a week of fish that are fatty but not high in mercury or PCBs is pretty sound advice," says Kang.

It's also possible that something

about fish other than its DHA and EPA may protect the brain. 🐟

<sup>1</sup> *Stroke* 42: 2672, 2011.

<sup>2</sup> *J. Alzheimers Dis.* 20: 699, 2010.

<sup>3</sup> *Neurol.* 56: 42, 2001.

<sup>4</sup> *Neurobiol. Aging* 21: 49, 57, 2000.

<sup>5</sup> *Ann. Neurol.* 70: 774, 2011.

<sup>6</sup> *J. Am. Geriatr. Soc.* 59: 1484, 2011.

<sup>7</sup> *J. Am. Geriatr. Soc.* 56: 1028, 2008.

<sup>8</sup> *Exp. Gerontol.* 47: 858, 2012.

<sup>9</sup> *Diab. Care* 36: 4036, 2013.

<sup>10</sup> *JAMA* 292: 2237, 2004.

<sup>11</sup> *N. Engl. J. Med.* 369: 540, 2013.

<sup>12</sup> *Eur. J. Pharmacol.* 719: 170, 2013.

<sup>13</sup> *Neuroepidemiol.* 34: 200, 2010.

<sup>14</sup> *JAMA Neurol.* 70: 967, 972, 2013.

<sup>15</sup> *Arch. Neurol.* 68: 743, 2011.

<sup>16</sup> *Nature* 400: 418, 1999.

<sup>17</sup> *Arch. Neurol.* 67: 71, 2010.

<sup>18</sup> *J. Alzheimers Dis.* 22: 569, 2010.

<sup>19</sup> *JAMA* 300: 1027, 2008.

<sup>20</sup> *JAMA* 292: 1454, 2004.

<sup>21</sup> *Lancet Neurol.* 11: 1006, 2012.

<sup>22</sup> *Neurobiol. Aging* 34: 2827, 2013.

<sup>23</sup> *Science* 326: 1005, 2009.

<sup>24</sup> *Science* 342: 373, 2013.

<sup>25</sup> *JAMA Neurol.* 70: 1544, 2013.

<sup>26</sup> *J. Alzheimers Dis.* 35: 413, 2013.

<sup>27</sup> *Arch. Intern. Med.* 171: 1571, 2011.

<sup>28</sup> *Ann. Neurol.* 72: 135, 2012.

<sup>29</sup> *J. Nutr. Health Aging* 2013. doi:10.1007/s12603-013-0409-9.

<sup>30</sup> *J. Acad. Nutr. Diet.* 112: 816, 2012.

<sup>31</sup> *J. Alzheimers Dis.* 2013. doi:10.3233/JAD-130830.

<sup>32</sup> *J. Gerontol. A Biol. Sci. Med. Sci.* 68: 1255, 2013.





## A Multi for Eyes?

Taking an ordinary daily multivitamin may modestly lower your risk of cataracts, according to the largest, longest study to date. However, a multi's impact on macular degeneration, the most common cause of blindness in older people, is somewhat blurry.

Researchers gave more than 14,600 men aged 50 or older in the Physicians' Health Study either a daily multivitamin for seniors (Centrum Silver) or a placebo. None of the men had been diagnosed with a cataract or degeneration of the macula (the center of the retina) when the study began.

After 11 years, those who had been taking the multivitamin had a 9 percent lower risk of cataracts than those who got the placebo. In particular, the multi seemed to lower the risk of nuclear cataracts, the most common (though not the most serious) type.

The multi takers had no lower (or higher) risk of macular degeneration serious enough to cause vision loss—the outcome the trial was designed to examine. However, the risk of *any* macular degeneration (including cases that didn't cause vision loss) was 22 percent higher in the multi takers. The researchers suggested that other studies should look into the impact of a multi on macular degeneration.

**What to do:** It's worth taking a multivitamin if it supplies nutrients—like vitamins D and B-12, calcium, or iron—that you don't get enough of from your food (see *Nutrition Action*, Nov. 2013, p.1). The 9 percent lower risk of cataracts isn't compelling enough to make a multi essential.

*Ophthalmology* 2013. doi:10.1016/j.ophtha.2013.09.038.

## Organic Milk Misunderstanding

"More helpful fatty acids found in organic milk," reported *The New York Times*.

The study—it was partially funded by the organic-dairy producer Organic Valley—found that organic whole milk has a lower ratio of omega-6 to omega-3 fats than conventional whole milk. But that doesn't matter:

■ **Omega-6 fats aren't harmful.** Polyunsaturated omega-6 fats (found in, among other things, nuts, soybean oil, and canola oil) help lower heart disease risk. The evidence that they cause inflammation or other problems is skimpy (see *NAH*, June 2012, p. 1).

■ **All milk is low in omega-3 fats.** Organic whole milk may have more than non-organic whole milk, but neither has much. One cup of organic whole milk

has only 19 milligrams of the long-chain omega-3 fats EPA and DPA (a cousin of DHA). You'd get 1,000 mg in 3 oz. of salmon. And the whole milk delivers 5 grams of saturated fat (a quarter of a day's worth).

■ **ALA may not matter.** Organic whole milk has more ALA (a shorter-chain omega-3 fat) than non-organic, the study reported. But recent trials have questioned whether DHA and EPA prevent heart disease, and the evidence for ALA is even weaker. (What's more, a tablespoon of canola or soy oil has 17 times the ALA of a cup of organic whole milk.)

**What to do:** Drink organic milk if you want, but not for its omega-3 fats.

*PLoS ONE* 2013. doi:10.1371/journal.pone.0082429.

## Go Nuts

Nuts may lower the risk of dying prematurely of heart disease and cancer, according to a new study funded by the nut industry and the government.

Scientists tracked roughly 76,000 women for 30 years and 42,000 men for 24 years. Those who ate one or more servings a day of peanuts or other nuts (a serving is about ¼ cup) had a 20 percent lower risk of dying than those who ate none. The risk was about 15 percent lower for those who ate nuts 2 to 6 times a week, and 7 percent lower for those who ate nuts less than once a week.

However, the nut eaters were leaner, less likely to smoke, and more likely to exercise, take a multi, and eat more fruits and vegetables. Although the researchers accounted for those differences, it's possible that something else about people who eat nuts might explain their lower risk. (The study didn't look at people who eat peanut butter.)

**What to do:** Eat a handful of (calorie-dense) nuts *instead of* carbs—like chips, a bagel, or sweets—for a quick snack. Toss some sliced nuts on your salad, yogurt, or fish.

*N. Engl. J. Med.* 369: 2001, 2013.

## Soda & Uterine Cancer

Sodas and other sugar-sweetened beverages may raise the risk of cancer of the endometrium (the lining of the uterus).

Researchers tracked 23,000 postmenopausal women in the Iowa Women's Health Study for 24 years. Those who averaged three servings of soda a week had a 74 percent higher risk of type I endometrial cancer (the most common kind) than those who drank none.

However, women who drank more soda were less likely to exercise and more likely to take estrogen. Although the investigators accounted for those and other differences, something else about soda drinkers may explain their increased risk.

**What to do:** Don't drink sugar-sweetened beverages. (That goes for men, too.) And watch your weight. Obesity and taking estrogen without progestin are stronger risk factors than soda for endometrial cancer. 🍌

*Cancer Epidemiol. Biomarkers Prev.* 2013. doi:10.1158/1055-9965.EPI-13-0636.

# Exercising the Truth

## What works? What doesn't?

BY STEPHANIE SCARMO

There are a hundred good reasons why you should exercise. And there are probably a thousand opinions about *what* to do, *how much* to do, and *which* exercises help *what*. Here's the latest evidence on some you may have heard.



**You can lose as much weight walking as running**

"Want to lose weight? Then run, don't walk," reported *U.S. News & World Report* last April.

That's what a study at the Lawrence Berkeley National Laboratory in California concluded when it compared men and women who increased their walking or running during the six-year National Walkers' and Runners' Health Studies.

But people who choose to run may be different—they may be more physically fit, for example—than people who choose to walk.<sup>1</sup>

To avoid those pitfalls, Cris Slentz and his colleagues at the Duke University School of Medicine in

North Carolina randomly assigned 120 overweight or obese middle-aged men and women to one of three exercise programs or to a non-exercising control group.

The exercisers worked out on treadmills, cycles, or elliptical trainers at an intensity equal to either walking or jogging.<sup>2</sup> All were told not to change what they ate.

After six months, those who exercised the equivalent of walking 11 miles a week had lost the same amount of weight—about three pounds—as those who exercised the equivalent of jogging 11 miles a week. But it took the "walkers" three hours a week, while the

"joggers" needed only two hours.

"It takes longer to burn the same amount of calories when you're doing moderate-intensity activity like walking than when you're doing vigorous exercise like jogging," explains Slentz.

"Intensity doesn't have a significant effect on weight loss or fat loss," he adds. What matters is the total number of calories you burn.

Not surprisingly, a third group, which did the equivalent of jogging 17 miles per week—it took them three hours—lost eight pounds over the six months. Of course, they burned the most calories.

But many middle-aged and older people won't—or can't—do vigorous exercise.

"If you're lean and you can go jogging and not hurt yourself, that's what you should do," says Slentz. "But it turns out

that moderate-intensity exercise is probably pretty darn good for you. And at the end of the day, if people like to walk, they're more likely to walk than they are to run."

It's just that most people don't do enough. "Instead of 30 minutes a day, five days a week, it would be better to do 45 minutes or an hour, six or seven days a week," says Slentz.

When it comes to your heart, though, intensity matters. And

changing intensities may matter more. Researchers call it high-intensity interval training, or HIT.<sup>3</sup>

"If you want to increase cardiovascular fitness, vigorous exercise is probably the

second best, and high-intensity interval training is probably the best," says Slentz.

"There's not a ton of research on it yet, and most of the papers are young people getting on a bicycle going 30 seconds all out, busting their gut, trying to do it four or five times, and then taking 30 minutes of slower cycling just to recover from what they did to themselves," notes Slentz.

"They do it three times a week, so it seems like it's hardly any exercise because it's only 30-second bouts times four or five times," he adds. "But nobody's going to do that at middle age or older."

So Slentz is hoping to study what he calls MINT, or modified-intensity interval training.

"We're going to get 70-to-90-year-olds on a bicycle or treadmill, and we're going to try to get them to do 30 seconds or a minute, if possible, of vigorous exercise, then rest for a few seconds, then work really hard again," he explains. "We think that's going to be a very good way to improve their cardiovascular fitness."

But there's no good evidence that interval training is better for weight loss than continuous exercise.<sup>3,4</sup> When it comes to shedding pounds, it's the calories you burn...and the calories you eat.

"Exercise can cause some modest weight loss," says Slentz, "but you can lose more by dieting."

It's not just a question of losing weight, though. It's also not gaining weight.

"Don't assume you're going to stay thin if you continue to be inactive," says Slentz. "You're going to gain weight, and it will probably happen faster than you think."

"If you take enough people and weigh them, and six months later you weigh them again, some won't have gained weight, but most will have gained some, and a few will have gained a lot. Weight gain happens."



What matters for weight loss is calories burned, not sweat lost.



## If you exercise, it's okay to sit for the rest of the day

"For most of us, exercise is only a small proportion of our day, if that," says Genevieve Healy, who studies sedentary behavior at the University of Queensland in Australia. "What we do for the rest of the time we are awake is also important."

And what we *shouldn't* do is sit for long stretches of time, even if we're active at other times of the day.

When researchers tracked more than 123,000 adults for 14 years, people who did more exercise had a lower risk of premature death than those who did less. But even among people who did the most exercise, those who sat for at least six hours a day had a higher risk of premature death than those who sat for less than three hours.<sup>5</sup>

Why is sitting so bad?

"The large postural muscles of your legs and back are not contracting while you're sitting," explains Healy.

Animal studies suggest that fewer muscle contractions means that the pancreas secretes less insulin and that fats and sugars take longer to get cleared out of the blood, she notes. "So they're more likely to be stored as body fat or to clog arteries."

Healy has found that breaking up long bouts of sitting makes a difference.

On three separate days, she and her colleagues had 19 overweight or obese middle-aged adults sit for two hours, drink a 765-calorie liquid meal, then sit for another five hours. On one of the days, they sat still for all five hours. On the other two days, they got up every 20 minutes and walked for two minutes on a treadmill at a light pace (2 miles per hour) or a moderate-intensity pace (3.8 mph).

Compared with sitting with no breaks, walking on the treadmill—at either pace—lowered their blood sugar and insulin levels by about 25 percent.<sup>6</sup>

"The break from sitting doesn't need to be going out for a run," notes Healy. "It could be just going to get a drink from the water cooler."

Could something as simple as standing up improve your blood sugar and insulin? Healy is now looking.

Her advice: "Do your exercise, but also

think of your activity across the day. Stand up, sit less, move more, and more often...at least every 30 minutes."



## Wearing a fitness tracker can help you lose weight

Rupert Murdoch wears one on his left wrist. "This is a bracelet that keeps track of how I sleep, move, and eat—transmitting that information to the cloud," the international media mogul told an audience in Sydney, Australia, last November.

"It allows me to track and maintain my health much better."

Personal activity trackers—like the Jawbone Up, Fitbit Flex, and Nike+ Fuelband—are the latest personal fitness gadgets.

"Some of them, like the BodyMedia armband, measure total energy expenditure, as well as intensity of activity and bouts of activity," says Steven Blair, professor of exercise science at the University of South Carolina.

"If you sit for 10 minutes, and then get up and walk for one minute, it detects the different intensities and durations," Blair explains. "It's a more complex device that gets us closer to the truth than simple pedometers or accelerometers."

Are activity trackers worth their price tag—from \$10 for a step counter to over \$100 for a more sophisticated armband?

"If you want to change some behavior, whether it's flossing your teeth, eating more fruits and vegetables, or getting more exercise, keeping a record of that behavior is a sensible place to start," says Blair.

A recent study hinted that activity trackers might help people lose weight.

Blair and his colleagues enrolled 197 overweight or obese middle-aged adults in a weight-loss program for nine months. Fifty received only a weight-loss manual (they were the control group), 49 got

the manual plus an activity tracker to wear, 49 got the manual plus counseling sessions but no tracker, and 49 got the manual, the counseling, and the tracker.<sup>7</sup>

The activity tracker without counseling wasn't enough. Only those who wore the tracker *and* received group and telephone counseling lost more weight—about 13 pounds more—than the control group.

But for people who just want to know how physically active they are, "it's not necessary to have a really complicated and sophisticated device," notes Blair.

"A simple pedometer could tell you how many steps you're getting. And if you're getting 3,000 per day and you know that's not enough, you can set a realistic goal of 1,000 more. And next week you can check to see whether you met that goal."



A fitness tracker can help you lose weight...but probably not by itself.



## Good studies show that yoga lowers blood pressure

"Patients often say, 'I don't like to take medications. What can I do to lower my blood pressure?'" says Robert Brook, an associate professor of medicine at the University of Michigan.

"There's been an increasing interest in yoga, acupuncture, and other alternative ways to lower blood pressure, but no one had sifted through the data."

So that's what an expert panel of the American Heart Association did in a report it released last April.<sup>8</sup> To the panel, which Brook chaired, "alternative" meant measures beyond losing weight, cutting sodium, or taking prescription drugs.

Of all the alternatives, aerobic exercise was in a class of its own. In most of the studies that the panel reviewed, people did moderate-to-vigorous aerobic exercise for 40 minutes three to four times a week.

"We saw average reductions in systolic blood pressure of about 6 to 8 points in

people with high blood pressure who were doing aerobic exercise,” says Brook. (The drop would be smaller for people who don’t have high blood pressure.)

While that’s less than the 10-to-15-point drop you’d get from medication, it’s still substantial. “It’s the type of response you’d see for a DASH low-sodium diet or weight loss,” notes Brook.

After aerobic exercise came exercises like weight lifting and circuit training.

“Many patients think that they shouldn’t do resistance-type exercise, because there can be a short-term increase in blood pressure during the exercise,” says Brook. “But there’s also a short-term increase with aerobic exercise. We found that adding resistance exercise to aerobic led to lowering blood pressure a further 2 to 3 points.”

Also beneficial: device-guided slow breathing, which uses a machine to train people to slow down and deepen their breathing. The only machine approved by the Food and Drug Administration, called RESPeRATE, retails for \$300 online. Slow breathing could shave 3 to 4 points off systolic blood pressure, said the heart association panel.

The evidence for other “alternative” techniques wasn’t as solid.

“Isometric exercise provided the largest reductions—10 to 12 points,” says Brook.



There are good reasons to do yoga. Lowering blood pressure may not be one.

That was in people who were doing isometric handgrip exercises for 12 to 15 minutes (in two-minute bouts) at least three times a week.

However, “far fewer studies have looked at isometric exercise, and the studies were quite small,” Brook cautions, so the results are iffy.

The panel also gave a tentative thumbs up to Transcendental Meditation. “Studies consistently show a benefit for blood pressure lowering,” says Brook. The panel concluded that doctors “may” consider TM as a treatment for high blood pressure.

In contrast, “other meditation techniques, like zen or mindfulness-based stress-reduction meditations, were more hit-or-miss,” says Brook.

Nor did the panel find good evidence for yoga or acupuncture, both of which it advised doctors not to consider.

“I’m not here to say that they don’t work,” says Brook. “But there are fewer published studies.”

His bottom line: “Aerobic exercise and strength training form the core of alternative methods of lowering blood pressure.”

And that’s not just for people who have been diagnosed with high blood pressure (who may also need drugs to lower their pressure).

“Anyone with blood pressure over optimal would likely benefit from these alternative therapies,” says Brook. (Optimal is *less than 120 over less than 80*.) 🍌

<sup>1</sup> *Med. Sci. Sports Exerc.* 45: 706, 2013.

<sup>2</sup> *Arch. Intern. Med.* 164: 31, 2004.

<sup>3</sup> *Med. Sci. Sports Exerc.* 42: 1951, 2010.

<sup>4</sup> *Int. J. Obes.* 32: 684, 2008.

<sup>5</sup> *Am. J. Epidemiol.* 172: 419, 2010.

<sup>6</sup> *Diabetes Care* 35: 976, 2012.

## Enough, Already?

The Centers for Disease Control and Prevention recommends that adults get at least 2½ hours of moderate-intensity aerobic activity or 1¼ hours of vigorous-intensity aerobic activity, or an equivalent amount of a combination of the two, each week.

Why? People who do that much have a lower risk of premature death, heart disease, stroke, hypertension, type 2 diabetes, and depression.

*Moderate* intensity means you’re working hard enough to raise your heart rate and break a sweat. You should be able to carry on a conversation but not sing the words to a song. Some examples:



- Walking fast (3 mph)
- Riding a bike on level ground or on terrain with few hills
- Playing doubles tennis
- Pushing a lawn mower
- Ballroom dancing

*Vigorous* intensity means you’re breathing hard and fast, and your heart is beating rapidly. You shouldn’t be able to say more than a few words without pausing to take a breath. Some examples:



- Jogging or running
- Riding a bike fast or on hills
- Swimming laps
- Playing singles tennis
- Playing basketball

Is more exercise better? According to the CDC, adults who do 5 hours of moderate—or 2½ hours of vigorous—aerobic exercise every week have an even lower risk of heart disease and diabetes. They also have a lower risk of breast and colon cancer and are less likely to gain weight.

The CDC also recommends that adults do strength-training exercises two or more days a week. The exercises should cover all the major muscle groups (legs, hips, back, abdomen, chest, shoulders, and arms), and you should do enough repetitions until you absolutely can’t lift the weight one more time or do one more sit-up.



For free videos on how to strengthen your muscles, see [cdc.gov/physicalactivity/everyone/videos](http://cdc.gov/physicalactivity/everyone/videos).

<sup>7</sup> *Int. J. Behav. Nutr. Phys. Act.* 2011. doi:10.1186/1479-5868-8-41.

<sup>8</sup> *Hypertension* 61: 1360, 2013.



# 'Shroom Service

BY KATE SHERWOOD

Forget David Copperfield. You want to see *real* magic? Sauté a pan of mushrooms and watch them go from tasteless to sublime. Just make sure the raw mushrooms are firm and dry. And don't wash them. Wipe with a dry paper towel. That will keep them from getting soggy. 🍄

Got a question or suggestion? Write to Kate at [healthycook@cspinet.org](mailto:healthycook@cspinet.org).

## Simple Mushroom Sauté

Serves: 4 | Total Time: 20 minutes



- |  |  |
|--|--|
| 1 Tbs. + 1 Tbs. extra-virgin olive oil | ½ cup roasted red pepper (jarred), drained and diced |
| 1 lb. mushrooms, sliced                | ⅛ tsp. kosher salt                                   |
| 8 scallions, chopped                   |  |

As simple and delicious as it gets. We used a combination of browns, whites, and shiitake caps.

In a large skillet, heat 1 Tbs. of the oil over medium-high heat until shimmering. Sauté half the mushrooms until golden brown, 2-3 minutes. Remove to a plate and repeat with the remaining oil and mushrooms. When the second batch is brown, stir in the scallions and peppers, then return the first batch to the pan. Season with up to ⅛ tsp. of salt.

Per serving (¾ cup): calories 100 | total fat 7 g | sat fat 1 g  
sodium 125 mg | carbs 7 g | fiber 2 g | protein 4 g



## Mushroom Ragù

Serves: 4 | Total Time: 45 minutes



- |                                    |   |
|------------------------------------|---|
| 3 Tbs. extra-virgin olive oil      | ¼ tsp. dried thyme                        |
| 1 large carrot, finely chopped     | 1 15 oz. can no-salt-added diced tomatoes |
| 1 stalk celery, finely chopped     | 10 oz. fresh or frozen spinach            |
| 1½ lbs. cremini mushrooms, chopped | freshly ground black pepper               |
| 3 cloves garlic, minced            | ½ tsp. kosher salt                        |

Unlike a traditional ragù, this stew-like variation reaches comfort-food status without the need for meat. Try it over whole wheat pasta with a sprinkle of grated parmesan.

In a large, heavy pot or deep skillet, heat the oil over medium heat until shimmering. Add the carrots and celery and sauté until lightly browned, about 3 minutes. • Add the mushrooms and garlic and stir until the mushrooms release their juices, about 5 minutes. • Stir in the thyme, tomatoes, and 1 cup of water. Simmer until the mushrooms are tender and the sauce has thickened, about 15 minutes. • Stir in the spinach and heat through. Season with pepper and up to ½ tsp. of salt.

Per serving (1½ cups): calories 180 | total fat 11 g | sat fat 1.5 g  
sodium 340 mg | carbs 18 g | fiber 4 g | protein 8 g



## Chicken with Mushroom Cream Sauce

Serves: 4 | Total Time: 30 minutes



- |   |                              |
|---|------------------------------|
| 4 small boneless, skinless chicken breasts, about 1¼ lbs. | ½ cup finely chopped onion   |
| 1 Tbs. + 1 Tbs. extra-virgin olive oil                    | ½ cup fat-free half and half |
| ½ lb. button mushrooms, sliced                            | 2 Tbs. country dijon mustard |
|   | freshly ground black pepper  |

If you've given up stroganoff to avoid the beef and cream, you're going to love this new take.

Pound the chicken to an even ¼-inch thickness. • In a large non-stick pan, heat 1 Tbs. of the oil over medium heat until shimmering. Sauté the chicken until browned, about 4 minutes. Turn the chicken over and sauté until cooked through, 3-4 minutes. Remove from the pan to a serving plate and keep warm. • Add the remaining 1 Tbs. of oil to the pan. Stir in the mushrooms and onions and cook until lightly browned, 2-3 minutes. • Remove from the heat and stir in the half and half and mustard. Season with pepper and spoon over the chicken.

Per serving (1 breast + ½ cup sauce): calories 270 | total fat 11 g  
sat fat 2 g | sodium 380 mg | carbs 8 g | fiber 0 g | protein 32 g



# FREEZE FOR ALL

## WHAT'S HOT IN "HEALTHY" FROZEN ENTRÉES

BY JAYNE HURLEY & BONNIE LIEBMAN



It's been 60 years since Swanson introduced its first TV dinner (turkey, dressing, peas, and sweet potatoes, all for 98 cents). Convenience still explains why shoppers buy frozen entrées. But *what* they buy keeps changing.

It's not just interesting new dishes—and there are plenty—like black bean tamale verde, seafood cioppino, vegetable panang curry, truffle parmesan mac & cheese, pumpkin squash ravioli, and palak paneer. It's "bakes," "bowls," and bags you can steam, sauces or salad toppings you can add, and containers you can compost.

Here's a guide to help you sort through the healthy-sounding frozen entrées.

*The information for this article was compiled by Lindsay Moyer.*

**1. Look for less sodium.** The biggest barrier to finding healthy frozen entrées is salt. And it doesn't matter if you're looking at supermarket bestsellers or brands with a healthier reputation.

With the mainstreamers—think Bertolli, Marie Callender's, Stouffer's—you can pretty much count on 800 to 1,200 milligrams of sodium. That's a hefty chunk out of the 1,500 mg limit that experts recommend for an entire day for most adults.

"Light," "lean," "reduced-guilt," and other healthy-sounding frozen entrées like Lean Cuisine and Smart Ones trim the sodium to around 500 to 700 mg, and Healthy Choice never tops 600 mg.

Our Best Bites and Honorable Mentions have no more than 450 mg of sodium, which is generous, considering that most of them have just 200 to 400 calories—nowhere near a third of a day's worth.

We found a handful of lines that shave

the sodium by relying on flavorful ingredients like ginger, garlic, sundried tomatoes, lemongrass, shiitake mushrooms, toasted almonds, pumpkin seeds, sesame seeds, shallots, tahini, and white wine:

■ **Artisan Bistro.** Most of its 18 Bakes, Bowls, and Entrees have 300 to 550 milligrams of sodium. Seven are Best Bites. And how often do you see ingredients like edamame, lentils, asparagus, sweet potatoes, and quinoa in frozen trays?

What's more, Artisan's wild salmon comes from certified sustainable Alaskan fisheries, its chicken is free range, its beef is grass fed, and its vegetables and grains are organic. Also impressive: most of the dishes deliver 15 to 24 grams of protein.

■ **Lean Cuisine Honestly Good.** Each tray features a chicken breast, a fish filet, or beef strips over brown rice or part-whole-grain pasta, plus veggies like broccoli, edamame, snap peas, yellow carrots, and yellow zucchini.

Three of the six entrées are Best Bites, and you can lower the sodium in the other three by using less sauce, which comes in a separate pouch. Bravo.

■ **Luvo.** Luvo (formerly Lyfe Kitchen) keeps the sodium at 470 mg or less, and you can't beat ingredients like kale, artichokes, toasted almonds, red wheat berries, and brown basmati rice. Two of the five entrées are Best Bites. (A third, the Nine Grain Pilaf, just missed.)

Other lines with less sodium than most: **Amy's Light in Sodium** stays below 400 mg, but five of its eight entrées have too much saturated fat and/or white flour. **Sukhi's Lean Fare** also never hits 400 mg, but all four entrées use white rice instead of brown. (That's why they're Honorable Mentions, not Best Bites.) **Kashi** is heavy on whole grains, but only three of its 15 entrées are low enough in sodium and sat fat to be Best Bites.

**2. Skimp on sat fat.** Most healthy-sounding lines—like Amy's Light & Lean, Healthy Choice, Lean Cuisine, Michelina's Lean Gourmet, and Smart Ones—rarely climb above 3 grams of saturated fat, our limit for a Best Bite or Honorable Mention.

But if you're a fan of lasagna, mac & cheese, enchiladas, or curry, your tray could contain 1 gram of sat fat...or it could contain 16 grams.

■ **Lasagna.** Amy's delicious Light in Sodium Vegetable Lasagna (with 3½ grams



Just a touch of coconut milk, yet plenty rich and creamy.



Less sodium than other lasagnas. Too bad the pasta is only a quarter whole grain.



A chicken breast boosts the protein. Pomgranate juice boosts the flavor.



A nutty and chewy pilaf infused with mango and a hint of jalapeño and cilantro.



Much easier than making your own black beans, butternut squash, chard, and quinoa.



Creamy pasta plus a cup of broccoli equals comfort food for many.



A sweet and zesty mix of grains. Add some sautéed tofu for extra protein.



Bring your own greens. Chicken, veggies, and dressing are in the box.

of saturated fat) just missed an Honorable Mention. (The Light & Lean Spinach Lasagna has just 2½ grams of sat fat, but 540 mg of sodium.)

Whole Foods' 365 Organic Vegan Lasagna earned a Best Bite, and its Vegetable Lasagna just missed one. We found the thick whole-grain pasta in both a tad chewy, though.

If you don't need a single-serving tray and you live near a Trader Joe's, try Trader Giotto's Roasted Vegetable Multi-Grain Lasagna. It's got a bit too much sodium (480 mg), but it has more whole grain than refined flour and its veggies are delicious.

■ **Mac & cheese.** According to its Nutrition Facts label, Joe's Diner Mac 'n Cheese (from Trader Joe's) has 8 grams of saturated fat. That's not great. It's also not honest. Those 8 grams are in just half a tray.

Your best bets: Blake's Mac & Cheese with Veggies, Lean Cuisine Simple Favorites Macaroni and Cheese, Smart Ones Three Cheese Macaroni, and Trader Joe's Reduced-Guilt Mac & Cheese. All are made with white flour and have too much sodium (though none get above 570 mg), but the sat fat is just 2 or 3 grams *per tray*.

■ **Enchiladas.** Watch out. The Nutrition Facts on some boxes are for just one of the two enchiladas that come in the tray.

CedarLane Garden Vegetable Enchilada, Healthy Choice Chicken Enchilada Bake, Kashi Spicy Black Bean or Chicken Enchilada, and Lean Cuisine Simple Favorites Chicken Enchilada Suiza cut the sat fat to 1 to 3 grams, but their sodium (560 to 620 mg) is above Best Bite or Honorable Mention territory.

Better, try Amy's Light in Sodium Black Bean-Vegetable Enchilada. A pair has just 380 mg of sodium, 320 calories, and 1 gram of sat fat (Amy uses tofu instead of cheese).

■ **Curry.** Trader Joe's Vegetable Panang Curry has 590 calories and 15 grams of sat fat (thanks to coconut milk). Gulp.

Instead, try Artisan Bistro Thai Style Yellow Curry with Chicken Bowl. It keeps the sat fat to 3½ grams (just above our cut-off) by adding only a touch of coconut milk. It also misses our sodium cut-off, but its rice and quinoa are whole grain and delish.

**3. Go for whole grains.** "8 g whole grains per serving," says the Smart Ones Pasta with Ricotta and Spinach box. In a 9 oz. (255-gram) tray of mostly pasta, 8 grams ain't much. The pasta is mostly white flour.

Why bother? Artisan Bistro, Kashi, Lean Cuisine's Honestly Good and Spa Collection, Luvo, Michael Angelo's Natural, and Tai Pei Asian Garden use whole-grain pasta or brown rice in all (or nearly all) of their dishes.

With other brands—like Amy's, Evol, Healthy Choice, and Helen's Kitchen—the rice and pasta could be white, whole grain, or a mix. We only awarded Best Bites if the grain was 100 percent whole.

Pilafs from Kashi and Luvo go way beyond brown rice. Kashi's signature pilaf blends whole oats, brown rice, rye, hard red wheat, triticale, buckwheat, and barley with sesame seeds. Luvo has grains like quinoa, wheat berries, brown basmati rice, bulgur, and buckwheat groats in its Nine Grain Pilaf. Nice.

**4. Veg out.** Artisan Bistro, Kashi, Lean Cuisine Honestly Good, and Luvo don't add just *any* vegetables. We're talking spinach, sugar snap peas, edamame, broccoli, kale, and artichokes. But even those lines typically supply only about half a cup to a cup of veggies per tray. That's just one or two of the 10 servings of fruits and vegetables you should aim for each day. Even at the high end, Healthy Choice Modern Classics doesn't top 1½ cups.

Solution: add a salad. Tear open a bag of mixed greens and add veggies, beans, fruit, toasted nuts, dressing, whatever. Or microwave, steam, or sauté some broccoli or asparagus to have on the side or mix in.

Lean Cuisine Salad Additions offers another option. "Simply Add Your Lettuce," says the box. Everything else comes inside. For the Best Bite Bistro Chicken, that includes grilled chicken, asparagus, yellow carrots, red peppers, sweet and tangy vinaigrette with bacon, and a few crispy onion straws. Try it over mixed greens or baby kale. Mmm.

The other Salad Additions have around 500 to 700 mg of sodium. But if you can get by with half the packet of dressing, they drop into Best Bite territory.

**5. Look for protein.** People who are middle-aged or older need to get enough protein to avoid losing muscle. Most healthy-sounding entrées with chicken, fish, or meat typically supply 10 to 20 grams. Lean Cuisine Honestly Good, Michael Angelo's Natural, and nearly all Artisan Bistros have enough beef, fish, chicken, or turkey to hit 17 to 30 grams.

What if you're a vegetarian or you just enjoy dishes like Luvo Whole Grain Pilaf (7 grams of protein), Kashi Black Bean Mango (8 grams), or Amy's Light in Sodium Brown Rice & Vegetables Bowl (9 grams)? Reinforce your meal with a side of 0% plain greek yogurt (17 grams of protein per 6 oz.) or sautéed tofu (11 grams per 4 oz.).

**6. Ditch the tray.** Kudos to companies that use environmentally friendly packaging. Amy's, Evol, Kashi, and Luvo use boxes that are made from 100 percent recycled materials. Luvo also tucks its entrées into lightweight pouches, and Evol uses compostable bowls made from renewable sugarcane and bamboo.

Do you hear that, Healthy Choice? Lean Cuisine? Smart Ones? 🍴

# Cracking the Freezer Case

**Best Bites** (✓✓) and **Honorable Mentions** (✓) have no more than 450 milligrams of sodium and 3 grams of saturated fat and contain no artificial sweeteners. Best Bites contain only whole grain and no white potatoes. Honorable Mentions can contain refined grain and white potatoes. Entrées are ranked from least to most sodium, then least to most sat fat, then most to least protein.

Frozen Entrées (1 box, pouch, tray, etc.)	Calories	Sat Fat (g)	Sodium (mg)	Protein (g)
Whole Foods 365 Organic Vegetable Lasagna	450	4	200	20
✓✓ Michelina's Lean Gourmet Fettuccine Alfredo with Broccoli	260	3	250	10
✓✓ Artisan Bistro Bakes Chicken Parmesan	200	1	270	13
✓✓ Whole Foods 365 Organic Vegan Lasagna	440	1	280	20
✓ Artisan Bistro Bakes Wild Alaskan Salmon	240	2	280	16
✓ Caesar's Gluten-Free Chicken Lasagna	390	1	290	11
✓ Blake's Upside Down Chicken Waffle Pie	280	2.5	300	14
✓ Blue Horizon Wild—Mediterranean Salmon or Sweet & Spicy Filet of Sole <sup>1</sup>	270	2	320	15
✓✓ Amy's Light in Sodium—Black Bean-Vegetable Enchilada or Brown Rice & Vegetables Bowl <sup>1</sup>	290	1	330	10
✓ Amy's Light in Sodium Veggie Loaf	290	1	340	9
✓✓ Artisan Bistro—Chicken Citron, Ginger Chicken, Savory Turkey, Spiced Chicken Morocco Inspired, Wild Salmon, or Wild Salmon with Pesto <sup>1</sup>	300	1.5	340	20
✓✓ Trader Joe's Cod Provençale	400	2.5	340	24
✓ Healthy Choice Honey Roasted Turkey	250	1.5	350	17
✓✓ Luvo Whole Grain Pilaf	360	2	350	7
Amy's Light in Sodium—except Black Bean-Vegetable Enchilada, Brown Rice & Vegetables Bowl, and Veggie Loaf <sup>1</sup>	370	5.5	350	14
✓ Healthy Choice Café Steamers—Sweet Sesame Chicken or Sweet & Spicy Orange Zest Chicken <sup>1</sup>	330	1	360	17
Artisan Bistro Bakes—except Chicken Parmesan and Wild Alaskan Salmon <sup>1</sup>	260	3.5	370	14
✓✓ Kashi Sweet & Sour Chicken	320	0.5	380	18
✓ Sukhi's Lean Fare <sup>1</sup>	310	0.5	380	18
✓✓ Luvo Orange Mango Chicken	420	1	380	21
✓✓ Kashi—Black Bean Mango or Mayan Harvest Bake <sup>1</sup>	340	1.5	380	9
✓ Helen's Kitchen Korean Noodle Bowl	240	0.5	390	5
✓✓ Lean Cuisine Honestly Good—Lemon-grass Salmon, Plum Ginger Grain-Crusted Fish, or Pomegranate Chicken <sup>1</sup>	350	1.5	390	19
✓ Healthy Choice Modern Classics—Herb Crusted Fish, Spaghetti and Meatballs, or Sundried Tomato Chicken Alfredo <sup>1</sup>	290	2	390	20
✓ Trader Joe's Fusilli with Vegetables & Basil Pesto	380	2	390	10
✓✓ Evol Chicken & Vegetable Pasta	330	1	400	18
✓✓ Healthy Choice Café Steamers Pineapple Chicken	330	1	400	18
✓✓ Michelina's Lean Gourmet Lemon Garlic Herb Chicken	210	1	400	10
✓✓ Lean Cuisine Salad Additions Bistro Chicken	240	1	430	15
✓ Smart Ones—Broccoli Cheddar Roasted Potatoes, Mini Rigatoni Vodka Cream Sauce, or Santa Fe Style Rice & Beans <sup>1</sup>	260	2.5	430	10
✓ Ethnic Gourmet Lemongrass Basil Chicken	350	3	430	15

	Calories	Sat Fat (g)	Sodium (mg)	Protein (g)
✓✓ Amy's Light & Lean Quinoa & Black Beans	240	0.5	440	10
✓✓ Tai Pei Asian Garden Mango Chicken	320	1	440	16
✓ Lean Cuisine Glazed Chicken	240	1	450	22
✓ Saffron Road Thai Basil Chili Tofu	360	3	450	12
Luvo—Chicken Chili Verde, Nine Grain Pilaf, or Whole Grain Penne Pasta <sup>1</sup>	300	4	450	20
Trader Giotto's (Trader Joe's) Roasted Vegetable Multi-Grain Lasagna (¼ tray)	240	2.5	480	11
Artisan Bistro—Alaskan Salmon Cake, Grass-Fed Beef with Mushroom Sauce, or Southwest Style Grass-Fed Beef <sup>1</sup>	350	3.5	480	22
Healthy Choice Modern Classics—except Herb Crusted Fish, Spaghetti and Meatballs, and Sundried Tomato Chicken Alfredo <sup>1</sup>	330	2	500	18
Blake's Mac & Cheese with Veggies	300	3.5	510	7
Lean Cuisine Spa Collection <sup>1</sup>	270	1	540	16
Lean Cuisine Honestly Good—Honey Citrus Chicken, Pineapple Black Pepper Beef, or Roasted Red Pepper Chicken <sup>1</sup>	300	1.5	540	25
Healthy Choice Café Steamers—except Pineapple Chicken, Sweet Sesame Chicken, and Sweet & Spicy Orange Zest Chicken <sup>1</sup>	270	1.5	540	16
Healthy Choice Traditional Classics—except Honey Roasted Turkey <sup>1</sup>	300	1.5	540	16
Artisan Bistro Bowls <sup>1</sup>	270	3	540	17
Amy's Light & Lean—except Quinoa & Black Beans <sup>1</sup>	230	1.5	550	9
Lean Cuisine Culinary Collection—except Glazed Chicken <sup>1</sup>	260	2	570	16
Healthy Choice Baked <sup>1</sup>	250	2	570	14
Lean Cuisine Salad Additions—except Bistro Chicken <sup>1</sup>	270	1.5	580	16
Trader Joe's Reduced-Guilt <sup>1</sup>	250	2	590	16
Lean Cuisine Simple Favorites <sup>1</sup>	260	2	590	13
Kashi Steam Meal (for one) <sup>1</sup>	280	2.5	600	16
Evol—except Chicken & Vegetable Pasta <sup>1</sup>	390	6	600	19
CedarLane Garden Vegetable Enchilada	280	3	620	18
Michael Angelo's Natural <sup>1</sup>	370	6	620	25
Smart Ones—except Broccoli Cheddar Roasted Potatoes, Mini Rigatoni Vodka Cream Sauce, and Santa Fe Style Rice & Beans <sup>1</sup>	250	2	630	14
Michelina's Lean Gourmet—except Fettuccine Alfredo with Broccoli and Lemon Garlic Herb Chicken <sup>1</sup>	270	2.5	630	12
Kashi—except Black Bean Mango, Mayan Harvest Bake, and Sweet & Sour Chicken <sup>1</sup>	290	3	630	15
Tandoor Chef Balanced Vegetarian <sup>1</sup>	380	4	640	14
Amy's—Bowls or Indian <sup>1</sup>	340	4.5	680	13
Lean Cuisine Market Collection <sup>1</sup>	300	2	700	18
Tai Pei Asian Garden—except Mango Chicken <sup>1</sup>	300	1	730	15
Candle Cafe Vegan <sup>1</sup>	260	2.5	850	10
Atkins <sup>1</sup>	340	7.5	870	23
Trader Joe's Vegetable Panang Curry	590	15	1,030	14
Joe's Diner (Trader Joe's) Mac 'n Cheese	720	16.5	1,200	32

✓✓ Best Bite. ✓ Honorable Mention. <sup>1</sup> Average.

**Daily Limits** (for a 2,000-calorie diet): **Saturated Fat:** 20 grams. **Sodium:** 1,500 milligrams. **Protein Daily Target:** 75 grams.

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## RIGHT STUFF

### OATSTANDING



Oatmeal is hot.

It's at Dunkin' Donuts and McDonald's. It's at Starbucks, Au Bon Pain, and Panera. Even supermarket brands like Dole, Special K, and Quaker now sell hot cereal in single-serve cups that you can grab on your way out the door. Just add boiling water and stir (or cold water and microwave for a minute or so).

But **Dr. McDougall's Oatmeal Cups** are the cream of the crop. That's because you can "customize your sweetness!" as the package suggests. Each cup comes with a packet of sugar and salt. Use as much (or as little) as you wish.

In contrast, Dole Fruit & Oatmeal, Special K Nourish, and Quaker Real Medleys add sugars—sometimes disguised as dried cane syrup or white grape juice concentrate—to their oatmeal and/or fruit. (At least you can leave behind most of Dole's sugar by draining the fruit.)

Dr. McDougall jazzes up his organic oatmeal with flavors like **Apple Flax, Cranberry Almond, Hemp Peach, Organic Maple, and Fruit Flax & Nuts.** How's that for a change?

Dr. M says that without the sugar and salt packet, each (delicious) cup holds 180 to 260 calories and 6 to 9 grams of protein, with 1 gram or less of saturated fat and no sodium. (Depending on the flavor, the packet adds 3½ to 5 teaspoons of sugar and 200 to 330 mg of sodium.)

Most impressive: the 6 to 8 grams of unprocessed, intact fiber (mostly from oats) that should help keep you full and lower your cholesterol.

What a deal.

We've come a long way from Quaker Peaches & Cream Instant Oatmeal that contains no peaches or cream.

rightfoods.com - (650) 583-4993

## FOOD PORN

### IHEAVY



"Our crepes are light, delicate and rolled with savory or sweet ingredients for a meal that's a delicious choice any time of day—or night," says the **IHOP** Web site.

Why order a stack of pancakes or a belgian waffle when you can opt for light and delicate?

IHOP's **Garden Stuffed Crepes** sound especially virtuous. "Two crepes stuffed with Swiss cheese, eggs scrambled with fresh spinach, mushrooms & onions topped with hollandaise & tomatoes," says the menu. Spinach, mushrooms, onions, tomatoes. How can you go wrong?

Easily...and to the tune of 1,230 calories and 29 grams (1½ days' worth) of saturated fat. That's more "light and delicate" calories and sat fat than you'd find in any of IHOP's pancakes, french toasts, stuffed french toasts, or belgian waffles (at least until you add syrup).

Blame it on the hollandaise sauce, though the crepes, cheese, and eggs do their share. The 1,730 milligrams of sodium (a day's supply) just add salt to the wound.

Eating an order of Garden Crepes is like downing two eggs, three pork sausage links, and three slices of bacon, plus hash browns and toast with butter and jam.

Your best bet: IHOP's Simple & Fit dishes, which have less than 600 calories. Try the Vegetable Omelette (310 calories) or the 2-Egg Breakfast made with egg substitute, turkey bacon, whole wheat toast, and seasonal mixed fruit (340 calories).

So "fit" means light, and "light" means heavy? Guess you just have to know ILANGUAGE.

ihop.com - (866) 444-5144

## dish OF THE MONTH



### Quick Citrusy Salad

Toss 8 cups of loosely packed mixed greens with a dressing made by combining 2 Tbs. minced red onion, 1 Tbs. red wine vinegar, 2 Tbs. extra-virgin olive oil, and ¼ tsp. kosher salt. Top with 3 sliced clementines, ½ cup chopped avocado, and 2 Tbs. sunflower seeds. Serves 4.

## quick tip

On the fence about signing up for a supermarket loyalty card? Ask if the chain uses purchase data to contact shoppers who bought foods that were subsequently recalled. If it does, sign up. It could save your life.