

# Nutrition Action

APRIL 2014 \$2.50

**HEALTH LETTER**  
 CENTER FOR SCIENCE IN THE PUBLIC INTEREST

## WHAT'S *the* CATCH?

Why the latest study is rarely the final answer

BY BONNIE LIEBMAN



**D**o antioxidants lower the risk of cancer, heart disease, or memory loss? Does calcium prevent bone fractures? Is a low-fat (or low-carb) diet the key to weight loss? Does taking vitamin D prevent just about everything?

We're constantly bombarded by headlines about the latest study and its "Surprising! New!" findings that often contradict earlier results. It's enough to make your head spin.

In fact, few studies are game changers. But some results matter more than others. Here's a guide to help you see beyond the headlines.

Continued on page 3.



# Hoofing it Away from Beef



**D**eciding between steak and chicken tonight? Corn-fed beef is by far the worse choice, not just for you, but for the environment and for the welfare of the animals.

■ **Health.** Most cattle end up in feedlots, where high-calorie grains fatten them up quickly. The extra fat eventually zeroes in on human arteries. And red meat—especially hot dogs, sausages, and other processed meats—promotes colon cancer.

■ **Environment.** Whether cattle live out on the range or in feedlots, they emit methane gas, a potent cause of global warming. What's more, growing the corn and soybeans for feed requires huge amounts of fertilizer, pesticides, water, and fossil fuel. Then there's the stench from the manure at feedlots (which are called "concentrated animal feeding operations," or CAFOs), which can sicken nearby residents.

■ **Animal welfare.** The grain fed to animals in feedlots can cause digestive, hoof, and liver diseases and may necessitate the continuous use of antibiotics. That can trigger the growth of antibiotic-resistant pathogens that can infect humans.

The good news: the number of cattle has dropped to its lowest level—about 89 million head in 2012—since 1952, when our population was half what it is now. The average American consumed 42 pounds of beef in 2011, down more than a third since the mid-1970s. Americans now eat a third more poultry than beef.

The decline is partly due to drought in the Midwest and the Plains states that has scorched pasturelands and forced cattle ranchers to cut their herds. What's more,

federal laws requiring corn farms to use some of their crop for ethanol have boosted prices of corn and meat. Beef prices have climbed 26 percent over five years, piercing the \$5-per-pound mark in November 2012.

Beef is losing ground despite the industry's dollar-a-head "checkoff" program, which spends upwards of \$40 million a year on marketing and research. Over the years, ads tried to persuade us that "Beef Gives Strength" and beef is "What's for Dinner."



**Beef: you're better off if it's not what's for dinner.**

The industry also sponsors a National Beef Cook-Off, pays "Beef Ambassadors" to stoke sales, and is "engaging millennials with beef."

Meanwhile, many people are deciding that chicken is "what's for dinner." Others are switching to vegetarian fare. Many college and corporate cafeterias have adopted Meatless Mondays. And animal-welfare activists are teaching youngsters about the miserable lives of animals grown on factory farms.

The government could help protect our health

and the environment by slapping a tax on grain-fattened cattle. It could ban the routine use of critical antibiotics, which would lead to cleaner CAFOs and healthier animals. It could limit the air and water pollution that CAFOs cause. And it could end the beef marketing program. Of course, the cattle, corn, and soybean industries would fight those proposals in state capitals and in Washington.

What can you do in the meantime? Think twice when you approach the beef counter at supermarkets; skip the burgers and steaks at restaurants; and encourage your school or workplace cafeteria to save money, the environment, and lives by serving less beef.

Michael F. Jacobson, Ph.D.  
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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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# WHAT'S the CATCH?

Why the latest study is rarely the final answer



## 1 Cause and effect might be reversed.

"Drinking diet soda just makes you eat more," declared the headline on the "Today" show's Web site.

The study in question had reported that overweight or obese diet-soda drinkers consumed as many calories as drinkers of sugary soda.<sup>1</sup> Other studies have found that diet-soda drinkers are more likely to be overweight.<sup>2</sup>

But that doesn't mean that diet sodas cause people to eat more or gain weight.

"People who are overweight tend to consume more diet beverages because they're trying to lose weight," says Vasanti Malik, a research associate at the Harvard School of Public Health in Boston.

"So what you see is an artificial association between consuming these artificially sweetened beverages and body weight. It's a perfect example of what we call reverse causation."

The best evidence that diet soda doesn't cause weight gain: a Dutch trial that randomly assigned 641 children to drink a cup a day of soda sweetened with either sugar or the artificial sweeteners sucralose

Why do new studies seem to flip-flop so often? It's partly because old news is no news. A new study that overturns *everything you've ever heard* gets more press than the same old, same old results.

But the headlines can deceive when they play up the "earthshaking" findings and play down the dull, humdrum caveats. We explain some starting on this page.

To learn how researchers hunt for ways to prevent disease, from first hunch to conclusive trials, see p. 6. And see "Trial & Error" below for some key trial results.

plus acesulfame potassium for 18 months.<sup>3</sup> Those who got the regular soda gained more weight (and fat).

"This was a double-blind trial with a long-term follow-up, and they measured sucralose in the urine to make sure the children drank the sugar-free beverages," explains Malik. "So it was really well done." Smaller trials on adults have found similar results.<sup>4</sup>

Likewise, when some studies report more diabetes in diet-soda drinkers, it's probably because doctors have told people at risk for diabetes to switch to diet soda.

"In our studies, when we take into account whether people are dieting and changes in their weight, the association between diet soda and diabetes goes away," says Malik.<sup>5</sup>

## 2 A link doesn't prove cause and effect.

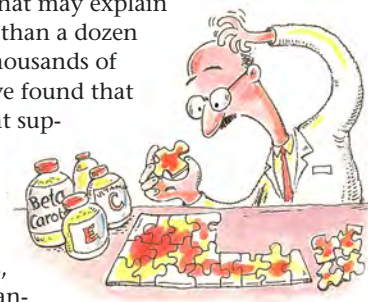
"Antioxidants block harmful chemical reactions caused by oxidation," explains Dr. Andrew Weil's online Vitamin Library. (Weil recommends that adults take four antioxidants every day: vitamin C, vitamin E, selenium, and mixed carotenoids—including beta-carotene.)

Maybe so, but a new animal study suggests that high-dose antioxidant

supplements may make tumors grow by reducing p53, a protein that suppresses tumors.<sup>6</sup> That may explain why more than a dozen trials on thousands of people have found that antioxidant supplements either had no effect on, or, in a few cases, increased cancer risk.<sup>7,8</sup>

What led researchers to launch the antioxidant trials in the first place?

"People who had higher intakes or blood levels of beta-carotene or vitamin C had a



>>>>>

## TRIAL & ERROR

Here's a sampling of large clinical trials with promising (●) or disappointing (●) results. To be succinct, we omitted many details about the participants, outcomes, and limitations of the studies. We also rounded the number of participants.

● **MRC Vitamin Study:** 1,800 women who had an earlier pregnancy with a neural tube defect (NTD) like spina bifida take folic acid (4,000 mcg a day), a multivitamin, both, or a placebo. Folic acid takers have a 72% lower risk of NTDs. Multivitamins have no effect.<sup>1</sup>

● **Wheat Bran Fiber Trial:** 1,400 people with previous colon polyps are told to eat cereal with either 2 grams or 13.5 grams of fiber from wheat bran every day for 3 years. No difference in polyp recurrence.<sup>2</sup>

● **AREDS:** 3,600 people with macular degeneration take vitamin C (500 mg), vitamin E (400 IU), plus beta-carotene (25,000 IU) and/or zinc (80 mg) plus copper (2 mg), or a placebo every day for 6 years. Supplement takers are 28% less likely to progress to advanced macular degeneration.<sup>3</sup>

1991

2000

2001

lower risk of cancer,” says JoAnn Manson, chief of preventive medicine at Brigham and Women’s Hospital in Boston. Other studies found a lower risk of heart disease in people who took vitamin E supplements.

“But correlation doesn’t prove causation,” adds Manson. Something else about those people could explain their lower risk.

For example, “blood levels of beta-carotene and vitamin C may be good markers of fruit and vegetable intake,” says Manson. “And people who eat more fruits and vegetables or who take vitamin supplements may be more health conscious, may exercise more, and may have an overall healthier diet.”

They may also do other things to protect their health. “They may be more likely to take medication if they have high blood pressure, or to take a statin if they have high cholesterol,” notes Manson.

Researchers try to adjust for those and other “confounders.” For example, they look at whether vitamin E takers have a lower risk of heart disease than vitamin E non-takers who report the same level of exercise.

But scientists can’t fully adjust for all confounders, especially the ones they don’t know about.

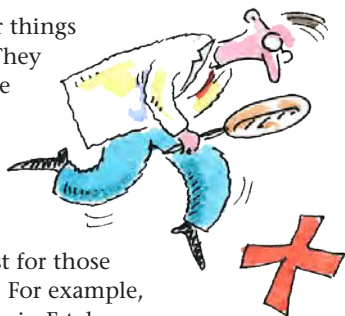
One eye-opening example: there is something different about people in a trial who take nearly all their pills, even if they’re taking a (inactive) placebo.<sup>9</sup>

“People who are more likely to take placebos have a lower risk of heart disease

and cancer and mortality,” says Manson.

And not just *slightly* lower. Among roughly 13,000 people assigned to take a placebo in the Women’s Health Initiative, those who took their pills faithfully had a 50 percent lower risk of hip fracture, a 30 percent lower risk of heart attack, a 40 percent lower risk of dying of cancer, and a 35 percent lower risk of dying of any cause than those who took their placebo pills less than 80 percent of the time.<sup>10</sup>

“That’s powerful evidence that unmeasured factors and behaviors are linked to a lower risk of chronic disease,” says Manson.



### 3 It’s not ready for prime time.

“When is a calorie not a calorie?” asked ABC News in 2012. “When it comes to losing weight, a

new study from Harvard University found that the number of calories consumed is not necessarily as important as the quality of those calories,” the network reported.

The study put 21 overweight or obese adults on one of three diets—low fat, low carb, or low glycemic index—for one month each. The diets all had the same number of calories. The authors’ conclusion: on the low-carb diet, the people burned 300 more calories a day than on the low-fat diet, and 150 calories more than on the low-glycemic-index diet.<sup>11</sup>



A 300-calorie difference is “roughly equal to an hour of moderate physical activity—without lifting a finger,” David Ludwig, lead author and director of the New Balance Founda-

tion Obesity Prevention Center at Boston Children’s Hospital, told the *Los Angeles Times*.

What’s the catch?

For starters, the diets didn’t make a difference in pounds gained or lost, making the results way too early for prime time.

If people burned more calories on the low-carb diet, “it’s surprising that the people on the low-carb diet didn’t lose more weight after a month,” notes Frank Sacks, professor of cardiovascular disease prevention at the Harvard School of Public Health.

Another catch: even if a low-carb diet led to more weight loss over time, it’s not clear that people could stick with it. “We did not design the diets for long-term practicality,” wrote the authors. For one thing, the researchers served the participants all their meals.

That’s not how the Pounds Lost study was designed. It was the largest (811 people) and longest (two-year) trial to test whether people lose more weight on a low-fat or low-carb (or high-protein) diet.<sup>12</sup>

“No one diet beat the others,” says Sacks, the lead author. “The participants lost an average of 13 pounds after six months, and kept off an average of nine pounds after two years, regardless of which diet they were on.”

What mattered most was how many

2002

**Diabetes Prevention Program:** 3,200 people with high fasting blood sugar (but not diabetes) participate in a weight-loss and exercise program for 3 years. Diet-plus-exercise group has 58% lower incidence of diabetes than placebo group.<sup>4</sup>

2006

**Women’s Health Initiative:** 48,800 women are told to eat a low-fat diet or their usual diet for 8 years. Low-fat group has no lower risk of breast or colon cancer.<sup>5,6</sup>

2007

**Women’s Antioxidant Cardiovascular Study:** 8,200 women at risk for heart disease take vitamin C (500 mg a day), vitamin E (600 IU on alternate days), and/or beta-carotene (83,000 IU on alternate days), or a placebo for 9 years. No difference in heart attacks, strokes, diabetes, or memory.<sup>7-9</sup>

2009

**SELECT:** 35,500 men take vitamin E (400 IU a day), selenium (200 mcg a day), both, or a placebo for 5½ years. Vitamin E takers have a 17% higher risk of prostate cancer. Selenium has no effect.<sup>10</sup>

2009

**Physicians’ Health Study II:** 14,600 men take vitamin E (400 IU on alternate days), vitamin C (500 mg a day), both, or a placebo for 8 years. No difference in total cancer, prostate cancer, colorectal cancer, lung cancer, macular degeneration, or cataracts.<sup>11-13</sup>

2010

**B Vitamin Treatment Trialists Collaboration:** 8 trials give 37,500 people at risk for cardiovascular disease folic acid (typically 2,500 mcg), B-12 (typically 1,000 mcg), and B-6 (typically 50 mg) or a placebo every day for 2 to 7 years. No difference in heart attacks, stroke, or cancers.<sup>14</sup>

calories people ate. “Ignore all the hype about diets that make pounds melt away,” says Sacks. “Losing weight comes down to how much food you put in your mouth.”

Critics might argue that the Pounds Lost study didn’t test a diet that was truly low in fat or carbs (or high in protein) because, after two years, the differences between diets had shrunk.

“It’s tough to get hundreds of people to stick with a diet for two years,” says Sacks.

But one could also argue that a study like Pounds Lost is a real-world test of the diets. “If participants in a study can’t stick with a diet, it’s even harder for people to do it on their own,” says Sacks.

## 4 It’s missing the big picture.

“Study finds calcium supplements don’t prevent broken bones,” announced the headline in *The New York Times* in 2006.

The *Times* was reporting on the Women’s Health Initiative (WHI), a massive clinical trial that randomly assigned roughly 36,000 postmenopausal women to take either calcium (1,000 mg) and vitamin D (400 IU) or a placebo every day. After seven years, the researchers found no fewer fractures in the women who were assigned to take calcium and vitamin D.<sup>13</sup>

What’s the catch? The *Times*’ headline may have missed the forest for the trees.

The study’s overall results compared everyone in the calcium group to everyone in the placebo group, whether or not they took the calcium or placebo pills the researchers gave them. That “intention-to-treat” analysis is legitimate, but sometimes it ignores critical evidence.

“There are three separate lines of strong evidence from the WHI that the calcium-and-vitamin-D supplement was beneficial for bone health,” says study co-author JoAnn Manson.

First, “we found significantly higher bone mineral density in the hip, which is the most important area,” in women who were assigned to take calcium plus vitamin D, explains Manson. Hip fractures are the most debilitating kind.

“Second, we found a 21 percent lower risk of hip fracture in women aged 60 and older” who took calcium plus D, she notes. And those are the fractures that matter.

“The hip fractures in the women in their 50s were often related to trauma—like skiing accidents—where you wouldn’t expect calcium and vitamin D supplements to help,” explains Manson. “When you’re talking about a hip fracture related to fragility, low bone density, and osteoporosis, those fractures are in women 60 and older.”

Third, when the researchers looked only at women of any age who actually took their calcium and vitamin D at least 80 percent of the time—a reasonable group to look at—those women had a 30 percent lower risk of hip fracture than those who took their placebos that often.

“A 30 percent reduction is pretty important,” says Manson. “Many people are missing that point.”

Taken together, “the evidence is strong that the calcium-and-vitamin-D supplement was beneficial for bone health.”

Are there downsides to taking calcium?

“We found a 17 percent increase in kidney stones in women taking calcium



supplements,” notes Manson.

But the average WHI participant was getting roughly 1,100 mg of calcium from food and the supplements she was taking on her own, so the calcium takers were getting close to 2,100 mg a day. “That could explain the increased risk of kidney stones,” suggests Manson.

And contrary to recent reports, “there was no increase in heart disease or stroke or other cardiovascular events” in the calcium-plus-vitamin-D takers, she adds.

Manson doesn’t advise all women to take a daily 1,000 mg calcium supplement, like the WHI participants did.

“The Recommended Dietary Allowance for women is 1,000 mg of calcium, and 1,200 mg after menopause,” she says.

“Women should try to get as much of that as possible from food, because calcium in foods is linked to a lower risk of kidney stones and heart disease. And they should take a supplement only to get up to the RDA. Very often that’s just 500 or 800 mg more.” 🍌

<sup>1</sup> *Am. J. Public Health* 2014.

doi:10.2105/AJPH.2013.301556.

<sup>2</sup> *Obesity* 20: 118, 2012.

<sup>3</sup> *N. Engl. J. Med.* 368: 1279, 2012.

<sup>4</sup> *Am. J. Clin. Nutr.* 76: 721, 2002.

<sup>5</sup> *Am. J. Clin. Nutr.* 93: 1321, 2011.

<sup>6</sup> *Sci. Transl. Med.* 6: 221ra15, 2014.

<sup>7</sup> *JAMA* 306: 1549, 2011.

<sup>8</sup> *N. Engl. J. Med.* 330: 1029, 1994.

<sup>9</sup> *Emerg. Themes Epidemiol.* 10: 1, 2013.

<sup>10</sup> *Med. Care* 49: 427, 2011.

<sup>11</sup> *JAMA* 307: 2627, 2012.

<sup>12</sup> *N. Engl. J. Med.* 360: 859, 2009.

<sup>13</sup> *N. Engl. J. Med.* 354: 669, 2006.

<sup>1</sup> *Lancet* 338: 131, 1991.

<sup>2</sup> *N. Engl. J. Med.* 342: 1156, 2000.

<sup>3</sup> *Arch. Ophthalmol.* 119: 1417, 2001.

<sup>4</sup> *N. Engl. J. Med.* 346: 393, 2002.

<sup>5</sup> *JAMA* 295: 629, 643, 2006.

<sup>6</sup> *JAMA* 295: 643, 2006.

<sup>7</sup> *Arch. Intern. Med.* 167: 1610, 2007.

<sup>8</sup> *Am. J. Clin. Nutr.* 90: 429, 2009.

<sup>9</sup> *Circulation* 119: 2772, 2009.

<sup>10</sup> *JAMA* 306: 1549, 2011.

<sup>11</sup> *JAMA* 301: 52, 2009.

<sup>12</sup> *Arch. Ophthalmol.* 128: 1397, 2010.

<sup>13</sup> *Ophthalmol.* 119: 1642, 2012.

<sup>14</sup> *Arch. Intern. Med.* 170: 1622, 2010.

<sup>15</sup> *JAMA* 308: 1871, 2012.

<sup>16</sup> *JAMA* 308: 1751, 2012.

<sup>17</sup> *Ophthalmol.* 121: 525, 2014.

<sup>18</sup> *N. Engl. J. Med.* 367: 1397, 2012.

<sup>19</sup> *N. Engl. J. Med.* 368: 1800, 2013.

### Physicians’ Health Study II:

14,600 men take a daily multivitamin for seniors (Centrum Silver) or a placebo for 11 years. Vitamin takers have an 8% lower risk of total cancers, but no lower risk of heart attack, stroke, or cognitive decline.<sup>15-17</sup>

**DRINK:** 640 normal-weight children (aged 5 to 12) who drink sugar-sweetened beverages (SSBs) get 1 cup a day of SSBs or sugar-free beverages. After 1½ years, weight gain, fat gain, and waist size are greater in the sugar-sweetened-beverage drinkers.<sup>18</sup>

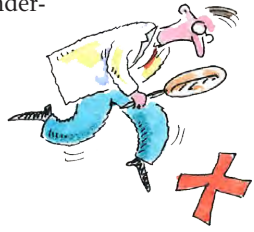
**Risk and Prevention Study:** 12,500 people at high risk for heart attack take 1,000 mg of fish oil or a placebo every day for 5 years. No difference in deaths, heart attacks, or strokes.<sup>19</sup>



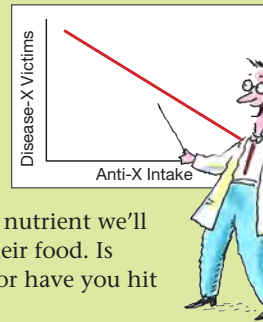
# Non-Triviale

**W**elcome to the zany, madcap world of epidemiology, where you, the intrepid scientist, attempt to unequivocally prove that something we eat can prevent disease. But watch out for those nasty pitfalls! They're out to undermine your work at every turn!

**A** For years, death rates from Disease X have been mounting, and nobody understands why. Your mission: conduct studies to find a way to stop the deadly scourge in its tracks. **Go to B, C, or D.**



**B Ecologic Studies.** You find that Disease X is 20 times more common in countries where people get less of a nutrient we'll call Anti-X from their food. Is Anti-X protective, or have you hit Pitfall 1? **Go to E.**



**P** **YOU WIN!** Anti-X reduces the risk of Disease X, and doesn't increase the risk of any other disease. Whew! Pitfall 3 may still be at work, so other trials may try to confirm your finding (especially in other groups of people). **Start writing your Nobel Prize acceptance speech.**



**O** **You strike out.** Disease X rates are equal in both groups (or worse yet, the Anti-X takers got more Disease X). Anti-X may not prevent Disease X, or you got caught by Pitfall 3, 6, 7, 8, 9, or 10. But no one wants to pay for another trial. **Find another disease to study.**

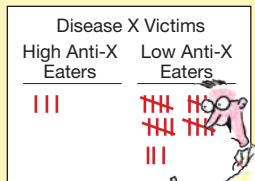


**N** **Clinical Trials.** The Disease X Foundation gives you umpteen million dollars to conduct a trial. You randomly assign thousands of people who don't have Disease X to take either Anti-X or a placebo. Neither they nor your research team knows who's getting what. After five or 10 years, you'll see if Disease X is less common in the Anti-X takers. **Go to O or P.**



**M** Other cohort studies confirm your findings. This is the end of the road if a clinical trial isn't feasible. But Disease X is common, and it's easy to give people Anti-X or a placebo. **Go to N.**

**L** **Yesss!** People who report eating more Anti-X are less likely to get Disease X after five or 10 years. Pitfall 1 or 3 may still explain your results. **Go to M.**



# Common

**1. CONFOUNDING.** Is it a lack of Anti-X—or something else about people with Disease X—that's causing their illness?

*Example: People with low vitamin D levels may have a higher risk of heart disease because they exercise less outdoors (so they make less vitamin D from sunlight) or because they're obese (which lowers vitamin D blood levels).*

**2. CAUSE OR EFFECT?** Low levels of Anti-X in the blood could be a result, not a cause, of Disease X (reverse causation).

*Example: In some studies, lean people have a higher risk of dying than those who are overweight. But the lean people may be more likely to die because illness or smoking caused them to lose weight.*

**3. CHANCE.** Reso... statistics to estim... their results ar... the odds are less than 1... are "statistically signific... means there's up to ne... chance that your result...

**4. MISCLASSIFI...** no link becaus... rarely determin... a little Anti-X.

*Example: Studies may... weight or obese peopl... sugar than others bec... underreport how muc...*

**5. BIAS.** Just one... sible biases: Di... alter what "cas... having eaten (recall bi...

Illustrations: Loel Barr.

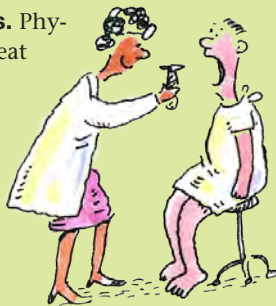
# al Pursuit

- Descriptive Studies
- Observational Studies
- Intervention Trials

**C Cross-Sectional Studies.** Disease X victims get less Anti-X from their diet and have lower levels of Anti-X in their blood. Is Anti-X protective, or have you hit Pitfall 2? **Go to E.**



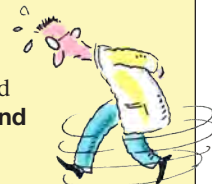
**D Case Reports.** Physicians who treat patients with Disease X report that they appear to consume less Anti-X than other patients. Is Anti-X protective, or have you hit Pitfall 1, 2, or 5? **Go to E.**



**E** It's time for studies that don't just *describe* who, when, or where Disease X strikes. You need to *test* whether people who have Disease X ate less Anti-X. That's tough because it's hard to measure what any one person typically eats. **Go to F.**

**F Case-Control Studies.** This is the quickest, least expensive place to start. You contact people who already have Disease X (cases). Then you find similar people who don't have Disease X (controls). You ask both groups what they typically ate over the last 10 years (and about their exposures to other possible causes of Disease X). **Go to G or H.**

**G Shucks.** People with Disease X don't appear to have eaten less Anti-X than people without the disease. Pitfall 1, 3, 4, or 5 may have obscured a link. **Go back to F and try again.**



**H Congrats!** You find a link and you're a star! The media reports that "Anti-X reduces the risk of Disease X." It sounds like you gave healthy people Anti-X and they didn't get Disease X. But you know better. What's more, your results may still be due to Pitfall 1, 2, 3, 4, or 5. **Go to I.**



## Pitfalls

Researchers use statistics to state the odds that a result is due to chance. If you find a link in 20, your results are "statistically significant." But that doesn't mean that nearly a 5 percent of the time, your results are a fluke.

**CAUTION.** You find a link, but you can't accurately measure who gets a lot or who gets a little.

You find that overweight people consume no more Anti-X than normal-weight people because heavier people eat more Anti-X.

One of many possible reasons for a link between eating Anti-X and developing Disease X may be "confounding factors" (other factors).

**6. TOO SHORT TERM:** Anti-X would have prevented Disease X if you had waited longer or tested younger people.

**7. TOO SMALL:** Your study didn't have enough people to see a difference in rates of Disease X.

**8. WRONG PEOPLE.** Anti-X prevents Disease X, but not in the gender, age group, race, etc., you studied.

**9. WRONG DOSE.** Anti-X would have prevented Disease X if you had used a larger (or smaller) dose.

**10. TOO LITTLE DIFFERENCE.** Your Anti-X group stopped taking Anti-X or your placebo group started taking Anti-X.



**K Sorry.** You find no link between eating Anti-X and developing Disease X. Pitfall 1, 3, 4, 6, 7, or 8 may explain why. **Find another clue to Disease X to study.**



**J Cohort Studies.** You ask hundreds or thousands of people who don't have Disease X (the "cohort") what they typically eat. Then you wait five or 10 years to see who gets Disease X. There's less of a chance of recall bias or reverse causation because you collected diet information *before* people got sick. **Go to K or L.**

**I** A few dozen more case-control studies are done. Some don't find a link—possibly because of pitfalls—but most do. If Disease X is rare, this might be the end of the road, because it would take too many people to do cohort studies or intervention trials. You'd have to rely on other evidence to prove your case. That includes animal studies or a clearer picture of how Anti-X works. **Go to J.**



## Not So Sweet Heart

**A**dded sugars—including ordinary sugar and high-fructose corn syrup—have been linked to a higher risk of dying of a heart attack or stroke.

Researchers tracked roughly 11,700 people in the National Health and Nutrition Examination Survey III—a nationally representative sample of Americans—for 15 years. Those who got at least 10 percent but less than 25 percent of their calories from added sugars had a 30 percent higher risk of dying of a heart attack, stroke, or other cardiovascular event than those who got less than 10 percent of their calories from added sugars. The risk was nearly three times higher for the one in 10 participants who

got at least 25 percent of their calories from added sugars.

People who drank at least seven servings of sugar-sweetened beverages a week had a 29 percent higher risk of dying of cardiovascular disease than those who consumed no more than one serving a week.

**What to do:** This kind of study can't prove that added sugars cause lethal heart attacks or strokes, since something else about people who eat more sugar may explain their higher risk. But added sugars increased some risk factors for heart disease in other studies, so it's worth aiming for the American Heart Association's daily limits: 100 calories' worth (6 teaspoons) for women and 150 calories' worth (9 teaspoons) for men. In particular, minimize sugar-sweetened beverages (including sodas, energy drinks, fruit drinks, and commercially sweetened tea or coffee drinks), which account for upwards of 40 percent of the average person's added-sugar intake. Sweetened beverages also have been linked to a higher risk of diabetes and weight gain.

*JAMA Intern. Med.* 2014. doi:10.1001/jamainternmed.2013.13563.

## Tomato Sauce for the Prostate?

**T**omato sauce and other lycopene-rich foods may help protect men against lethal prostate cancer.

Researchers followed nearly 50,000 male health professionals for 23 years. Those who consumed the most lycopene had a 28 percent lower risk of lethal prostate cancer than those who consumed the least.

**What to do:** It can't hurt to eat more tomato sauce (unless it's on pizza smothered with cheese and sausage). Just remember that it's too early to know whether lycopene lowers the risk of lethal prostate cancer.

Other studies have found no link between lycopene and prostate cancer, possibly because lycopene may protect only against

lethal cancers and not against the less harmful prostate cancers that many studies include.

What's more, some studies may have seen no link because they measured lycopene intake only once (rather than every four years, as in this study) or because they didn't consider whether the lycopene was easier to absorb (as it is in cooked tomatoes) or harder to absorb (as it is in raw tomatoes).

Still other studies may have seen no link because they were done in countries—Uruguay, for example—where lycopene intakes don't vary much.

*J. Natl. Cancer Inst.* 2014. doi:10.1093/jnci/djt430.

## Resisting Diabetes

**A**erobic exercise like walking or running lowers the risk of diabetes. But what about muscle-strengthening exercise like weight lifting or lower-intensity muscle conditioning exercise like stretching, toning, or yoga?

Scientists tracked roughly 99,000 women aged 36 to 81 in the Nurses' Health Study. After eight years, those who reported doing muscle-strengthening and/or conditioning exercise for more than 2½ hours a week had a 35 to 40 percent lower risk of type 2 diabetes than inactive women. Women who did those exercises for 1 to 2½ hours a week had a 20 to 25 percent lower risk.

Even better, women who reported at least an hour a week of muscle-strengthening and conditioning plus at least 2½ hours a week of aerobic exercise had a 67 percent lower risk of diabetes than inactive women.

**What to do:** Get moving. Though this type of study can't prove cause and effect, other studies show that exercise helps keep a lid on blood sugar, blood insulin, and weight gain...not to mention heart disease, stroke, colon and breast cancer, and more.

*PLoS Med.* 11: e1001587, 2014.

## Salt & Flexible Arteries

**A**fter age 30, your arteries get stiffer and less able to widen when they need to, and that may boost your risk of heart attack, stroke, and memory loss. Cutting back on salt may help, even if you have normal blood pressure.

Australian researchers had 25 overweight or obese people with normal blood pressure eat a diet with typical sodium levels (3,600 milligrams a day) for six weeks and a lower-sodium diet (2,600 mg a day) for another six weeks. The participants' arteries were better able to dilate (widen) when they were on the lower-sodium diet.

**What to do:**

Cut back on high-sodium foods whenever possible. 🌱



*Atherosclerosis* 233: 32e38, 2014.



# ADDING YEARS?

## THREE COINS IN THE FOUNTAIN OF YOUTH

BY DAVID SCHARDT



**W**ant to live longer? Just take this pill. Or eat this way. There is no shortage of schemes to outrun Father Time. But at least three ideas are being taken seriously by researchers. Here's the latest on each.

## RESVERATROL

**“R**ediscover your youthful DNA...reawaken youthful activity with this revitalizing, age-defying regimen.”

To listen to the ResVitalé company describe its resveratrol supplement, you'd think that turning back the clock was just a matter of popping some pills.

“Extending lifespan was the source of a lot of the initial excitement about resveratrol,” says researcher Joseph Baur of the University of Pennsylvania's Institute for Diabetes, Obesity, and Metabolism.

In 2003, Baur began working in the laboratory at Harvard University where researchers had recently discovered that resveratrol—which is found most notably in grapes (and the wine that's made from them)—could activate enzymes called sirtuins, which are involved in aging.

When the Harvard group and other researchers gave resveratrol to yeast, fruit flies, worms, and fish, the animals and yeast lived longer. “Resveratrol also makes obese mice live longer than they would otherwise,” says Baur.

That could be because it helps keep them from dying of diabetes.<sup>1</sup> “In mice, resveratrol lowers blood glucose levels and increases insulin sensitivity,” Baur notes. “But there is no evidence that resveratrol can extend the lifespan of healthy mice.”<sup>2</sup> Or people, obese or not.

### Of Men, Not Mice

“We don't have a clear answer on what impact resveratrol has in humans,” says Eric Ravussin, director of the Nutrition Obesity Research Center at the Pennington Biomedical Research Center in Baton Rouge, Louisiana.

It would take too long for researchers to give people resveratrol or a placebo

and wait to see which group lives longer. Instead, they see if resveratrol can improve risk factors for diseases—like diabetes and heart disease—that can cut lives short.

So far, the results have been contradictory. Why?

“Most of the published studies involve only 10 to 30 subjects,” notes Baur. And they've used different doses of different resveratrol preparations in different kinds of people.

“Resveratrol is not a drug,” notes Ravussin. “It's a dietary supplement that can vary from brand to brand, and some formulations may contain other plant

■ In the Netherlands, when 11 obese men took 150 mg a day of resveratrol (the same formulation the St. Louis women took) for a month, they had greater insulin sensitivity, lower blood pressure, and lower levels of blood glucose and liver fat than when they took a placebo for a month.<sup>4</sup>

■ In a Danish study of 24 obese men, insulin sensitivity, blood pressure, and belly fat were no different in those who took a high dose (1,500 mg) of a different resveratrol formulation every day for a month than in those who took a placebo.<sup>5</sup>

### The Anti-Exercise?

Is resveratrol safe? “There haven't been controlled studies to show that it's safe to take for long periods of time,” notes Baur.

A recent study may have found one downside. Last year, Danish researchers assigned 27 sedentary men in their 60s and 70s to take 250 mg of resveratrol or a placebo every day while participating in a high-intensity aerobic and resistance exercise program.

After eight weeks, the resveratrol takers' oxygen capacity (a sign of aerobic fitness) hadn't improved as much as the placebo takers'. And blood pressure, triglycerides, and LDL (“bad”) cholesterol dropped only in the placebo takers.<sup>6</sup>

**The bottom line:** Until we know more about resveratrol's safety and effectiveness, save your money.



**You'd have to drink 68 bottles of red wine every day to get the amount of resveratrol that lowered blood pressure and blood sugar in obese Dutch men.**

compounds that could affect the results.” Some of the best studies:

■ At Washington University in St. Louis, among 29 normal-weight women in their 50s and 60s, those who took 75 milligrams of resveratrol every day for three months had no greater insulin sensitivity than those who got a placebo.<sup>3</sup> Nor did resveratrol affect their body fat, metabolic rate, cholesterol, or markers of inflammation.

<sup>1</sup> *Nature* 444: 337, 2006.

<sup>2</sup> *Cell Metab.* 8: 157, 2008.

<sup>3</sup> *Cell Metab.* 16: 658, 2012.

<sup>4</sup> *Cell Metab.* 14: 612, 2011.

<sup>5</sup> *Diabetes* 62: 1186, 2013.

<sup>6</sup> *J. Physiol.* 591: 5047, 2013.



# INTERMITTENT FASTING

**“W**e’ve known for a long time that if you reduce the calorie intake of rats or mice, they live much longer,” says Mark Mattson, chief of the laboratory of neurosciences at the National Institute on Aging (NIA) in Baltimore.

What happens in species closer to humans is more complicated. Rhesus monkeys fed 30 percent fewer calories lived longer in a study at the University of Wisconsin, but not in a study at the NIA.<sup>1,2</sup>

Why the different results? One possibility: The Wisconsin monkeys were fed fewer calories than monkeys fed as much high-sugar, high-fat food as they *wanted*. In contrast, the NIA monkeys were fed fewer calories than monkeys fed as much (low-sugar, low-fat) food as they *needed* to maintain their weight.

“One take-home message is that if you are an overweight monkey like those in Wisconsin, cutting back on calories will extend your lifespan,” says Mattson. “Whereas if you are eating a healthy diet and not overweight like the NIA monkeys, cutting back on calories may not extend your life, although you may experience some health benefits.”

What if you’re human? In the first good study in normal-weight or slightly overweight (but not obese) people, researchers asked roughly 150 men and women to consume 25 percent fewer calories at each meal than they needed to maintain their weight, and 75 similar people to follow their normal diet, for two years.

The calorie cutters managed to eat 12 percent fewer calories, and they lost 10 percent of their body weight. That may explain why their blood pressure was lower and their insulin worked better than those who ate their normal diets.

“They lowered their risk factors for heart attack, stroke, and diabetes,” says Eric Ravussin, director of the Nutrition Obesity Research Center at the Pennington Biomedical Research Center in Baton Rouge, Louisiana. The study hasn’t yet been published.

Why didn’t the calorie cutters cut more? “Eating less than you would like to every day is a struggle,” says Ravussin. “Some people can do it, but many cannot.”

But cutting calories only on *some* days may be easier.

## Mon, Tues, Weds, Thurs, Fri, Sat, Sun

“There’s the alternate-day modified fast,” says Ravussin. “Every other day you eat only one meal with maybe 30 percent of your normal daily calorie intake.”

And there’s the 5:2 diet, in which you eat a normal diet five days of the week, and only 30 percent of what you would normally eat on the other two days.

“Whichever it is, you have to make sure you don’t overeat on the normal days,” cautions Ravussin.

So far, intermittent fasting shows prom-

drinks and a multivitamin-and-mineral.

In each study, both calorie-cutting groups lost about the same weight. “But insulin resistance declined more in the 5:2 groups than in those who cut calories daily,” says Mattson. And in the three-month trial (the other trial lasted six months) the women on the 5:2 regimen lost more body fat.

Why did the 5:2 dieters do better? They were more likely to stick to their plan. “And on the two days that they ate only 500 to 600 calories, their metabolism shifted to burning fat,” says Mattson.

## Brain Diet?

Middle-aged rats, after being deprived of all food every other day for three months, lost 23 percent of their body weight and had better motor coordination and cognitive skills than similar rats who could eat all they wanted.<sup>6</sup>

One possible reason: “Intermittent fasting increases brain levels of a protein that stimulates the growth of new brain cells and the connections between them,” says Mattson.<sup>7</sup>

“We think what’s happening is that when you’re hungry, your brain cells are more active so you can figure out how to find food,” he explains. “During evolution, those who were able to figure out how to get food were the ones who survived.”

Today, our brain cells may respond in a similar way when we’re hungry.

Intermittent fasting also seems to postpone dementia, at least in animals. In mice bred to show signs of Alzheimer’s disease by middle age, eating only every other day delays the onset of dementia by the human equivalent of about 10 years.<sup>8</sup>

“That’s a big effect,” says Mattson. “But we’re nowhere near being able to say the same about humans.”

**The bottom line:** Cutting calories may not prolong your life, but it may lower your blood pressure and make your insulin work better.



In one study, calorie-restricted monkeys (left) didn’t live longer. In another study, they did.

ise in both animals and people.

“Laboratory animals that get no food at all on alternate days live about 30 percent longer than animals that eat their regular diets every day,” says Mattson.<sup>3</sup>

In humans, the 5:2 plan seems to hold an edge over fasting every day.

In two of the best studies, Mattson and colleagues divided 166 overweight middle-aged women into two groups. Both were told to cut calories by 25 percent—one by trimming the calories in each meal, the other by following a 5:2 plan.<sup>4,5</sup>

In both studies, the women were told to eat a high-protein “Mediterranean-type” diet with fruits, vegetables, whole grains, nuts, seafood, and olive oil, and only moderate amounts of dairy, poultry, eggs, and lean red meat.

On the two fasting days of the 5:2 diet, one study prescribed just four cups of low-fat milk, four servings of vegetables, and one serving of fruit. The other study prescribed about 9 oz. of lean protein, 3 servings of low-fat dairy, 4 servings of low-carb vegetables, and a low-carb fruit. Both also recommended low-calorie

<sup>1</sup> *Science* 325: 201, 2009.

<sup>2</sup> *Nature* 489: 318, 2012.

<sup>3</sup> *Mech. Ageing Dev.* 55: 69, 1990.

<sup>4</sup> *Int. J. Obes.* 35: 714, 2011.

<sup>5</sup> *Br. J. Nutr.* 110: 1534, 2013.

<sup>6</sup> *Age* 34: 917, 2012.

<sup>7</sup> *Endocrinology* 144: 2446, 2003.

<sup>8</sup> *Neurobiol. Dis.* 26: 212, 2007.



# TELOMERES

It's "the most important discovery in human history," according to physician and supplement salesman Al Sears on [alsearsmd.com](http://alsearsmd.com).

The discovery? When telomeres shorten, cells age. Telomeres are snippets of DNA and protein that cap the chromosomes that house the genes in each of our cells. The discovery netted three American scientists a Nobel Prize in 2009.

Telomeres keep the DNA at the ends of our genes from fraying or sticking together. They're most often compared to the plastic tips on shoelaces.

But unlike shoelace tips, telomeres change. "Each time a cell reproduces, its telomeres shorten a little bit, until the telomeres become so short that the cell can no longer reproduce," explains researcher Mary Armanios of the Johns Hopkins University School of Medicine in Baltimore.

Dozens of studies link shorter telomeres to increased body fat and a higher risk of diabetes, heart attack, and other conditions.<sup>1,2,3</sup>

"But the excitement over the possibility that telomere length could explain aging and disease should not replace the facts," Armanios cautions. "Telomere length varies widely among people of the same age," she notes. Some of that variation we inherit from our parents.

"Telomere length shortens in all of us as we age," adds Armanios. "We also know that abnormally or very, very short telomeres can cause disease in the lungs, bone marrow, and liver, because we find that happens in rare cases when someone is born with a gene mutation that leads to a faster shortening of their telomeres."<sup>4</sup> (Armanios treats those patients at Johns Hopkins.)

Our daily lives can also affect our telomeres. "Things that happen to us, such as psychological stress, can shorten our telomeres at a faster rate," says Armanios, "probably because they make our immune cells divide more often."<sup>5</sup>

But the typical shortening of telomeres in most people may not matter.

"If our telomere shortens by an extra 100 or 200 units, but we have thousands of units at the ends of our chromosomes, then it's not clear that this is enough to cause problems," says Armanios.

It's not even clear that the length of our telomeres is the critical factor.

"The rate of shortening or the shortest telomere in a cell may be what's really important, not the average length of a person's telomeres," says Felipe Sierra, director of the Division of Aging Biology at the National Institute on Aging in Bethesda, Maryland.

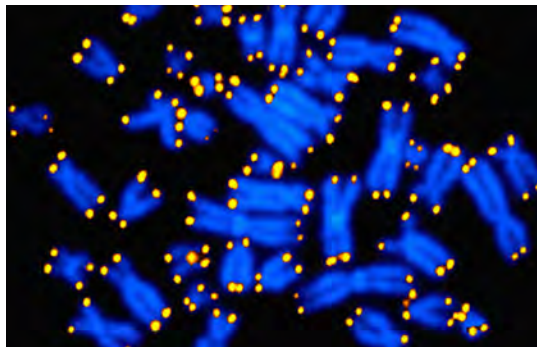
And it's not clear that lengthening our telomeres would improve our health, adds Sierra. "Shorter telomeres may be a marker, not a cause, of disease," he says.

Despite the uncertainty, some claim to know how to lengthen our telomeres.

## The Long and the Short of It

Dean Ornish of the University of California, San Francisco, reported last year that telomeres lengthened by an average of 10 percent in 10 men with low-risk prostate cancer who followed his lifestyle treatment program for five years.<sup>6</sup> The program included a very-low-fat diet rich in fruits, vegetables, whole grains, and plant protein, along with moderate exercise, stress management, and weekly support-group meetings.

Telomeres shortened by an average of 3 percent in 25 men with similar prostate



Telomeres (the bright points in this image) cap the tips of our chromosomes. When they shorten, cells age.

cancers who weren't in his program. But the study didn't randomly assign men to one program or the other, so it's possible that the men in the two groups were different in some way when they entered the study.

It's premature to conclude that a change in lifestyle can lengthen a person's telomeres, says Armanios.

What's more, she adds, "our current methods for measuring the length of telomeres aren't accurate enough to confidently say that someone's telomeres lengthened by 10 percent or shortened by 3 percent."

## Journey Toward Profit

"Begin your journey toward enduring youth" with bottles of TA-65, an extract of the Chinese herb astragalus "that lengthens human telomeres," beckons Al Sears on his Web site [www.primalforce.net](http://www.primalforce.net).

And bring your checkbook. A six-month supply of TA-65 costs \$4,000.

The evidence that it lengthens telomeres? In a company-funded study, average telomere length didn't change in 13 older men and women who took TA-65 for 12 to 18 months.<sup>7</sup> (The study didn't compare TA-65 takers to a "control" group that took a placebo.)

However, by sifting through the data, the company found that the percentage of short telomeres in the cells of seven of the 13 participants declined during the study. In five others, the percentage remained unchanged, while in one person, it increased.

That sounds pretty random, but the company researchers somehow concluded that TA-65 "lengthens critically short telomeres."

Four grand a little steep for an unproven supplement? For just \$480 you can snag a six-month supply of Imortalium, a mixture of six vitamins, four minerals, 48 plant extracts, 11 kinds of algae, and 11 other ingredients (including resveratrol) that "helps extend the lifespan of telomeres," according to [youngevity.com](http://youngevity.com).

Is there any evidence that taking Imortalium preserves the length of telomeres? The company couldn't provide any.

**The bottom line:** It's not clear whether you can do anything to lengthen your telomeres, or whether that would stave off disease or help you live longer. 🍌

<sup>1</sup> *Int. J. Obes.* 38: 177, 2014.

<sup>2</sup> *PLoS One* 8: e7999s, 2013.

<sup>3</sup> *Arterioscler. Thromb. Vasc. Biol.* 32: 822, 2012.

<sup>4</sup> *J. Clin. Invest.* 123: 996, 2013.

<sup>5</sup> *PNAS* 101: 17312, 2004.

<sup>6</sup> *Lancet Oncol.* 14: 1112, 2013.

<sup>7</sup> *Rejuvenation Research* 14: 45, 2011.



# Smart Asparagus

BY KATE SHERWOOD

My favorite way to cook asparagus is to toss with a bit of olive oil, then grill or broil until the spears are warm and charred in spots but still crunchy. But the versatile vegetable also provides the perfect canvas for intense toppings like these three. 🍷

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

## Asparagus with Pistachio & Lemon

Serves: 4 | Total Time: 10 minutes 

- |                               |                             |
|-------------------------------|-----------------------------|
| 1 Tbs. extra-virgin olive oil | 1 Tbs. fresh lemon juice    |
| 1 clove garlic, minced        | freshly ground black pepper |
| ¼ cup chopped pistachios      | ⅛ tsp. kosher salt          |
| 1 lb. asparagus, trimmed      |                             |



To trim thicker asparagus spears, just bend the stem ends until they snap off.

In a small sauté pan, heat the oil over medium heat until just hot. Sauté the garlic until it starts to color, about 1 minute. • Stir in the pistachios and remove from the heat. • Steam the asparagus until bright green and tender but still crisp, 2-3 minutes. Transfer to a serving dish. • Stir the lemon juice into the pan with the pistachios. Pour over the asparagus and season with black pepper to taste and up to ⅛ tsp. of salt.

Per Serving: calories 110 | sodium 60 mg | total fat 7 g  
sat fat 1 g | carbs 8 g | protein 4 g | fiber 3 g

## Asparagus with Goat Cheese & Dill Sauce

Serves: 4 | Total Time: 10 minutes 

- |  |                             |
|--|-----------------------------|
| 1 oz. goat cheese (about ¼ cup) crumbled | 2 Tbs. minced fresh dill    |
| 1 Tbs. mayonnaise                        | 1 lb. asparagus, trimmed    |
| 1 tsp. fresh lemon juice                 | freshly ground black pepper |



Prefer something milder than goat cheese? Try whipped cream cheese.

Whisk together the goat cheese, mayonnaise, lemon juice, and dill with 1 Tbs. of hot water until it forms a smooth sauce. • Steam the asparagus until bright green and tender but still crisp, 2-3 minutes. • Transfer to a serving dish and drizzle with the sauce. Season with black pepper.

Per Serving: calories 80 | sodium 50 mg | total fat 4.5 g  
sat fat 1.5 g | carbs 5 g | protein 4 g | fiber 2 g

## Asparagus with Shallot Marmalade

Serves: 4 | Total Time: 15 minutes 

- |                                   |                                 |
|-----------------------------------|---------------------------------|
| 2 Tbs. extra-virgin olive oil     | 2 tsp. reduced-sodium soy sauce |
| 1 cup minced shallot or red onion | 1 tsp. balsamic vinegar         |
| 1 tsp. whole-grain dijon mustard  | 1 lb. asparagus, trimmed        |



The savory and slightly tart marmalade also makes a great topping for vegetables like broccoli and cauliflower or for cooked chicken or fish.

Heat the oil in a medium sauté pan over medium heat until hot. Add the shallots and cook, stirring often, until golden brown, 7-8 minutes. Stir in the mustard, soy sauce, and vinegar and remove from the heat. • Steam the asparagus until bright green and tender but still crisp, 2-3 minutes. • Transfer to a serving dish and drizzle with the shallot marmalade.

Per Serving: calories 120 | sodium 120 mg | total fat 7 g  
sat fat 1 g | carbs 11 g | protein 4 g | fiber 2 g



# QUICK-FIX CHIX

## POULTRY FROM PACKAGE TO PLATE

BY JAYNE HURLEY &amp; BONNIE LIEBMAN



**A**mericans now eat twice as much chicken and turkey as we did in 1970. But the poultry aisle has changed.

Not far from the fresh and frozen thighs and breasts are burgers, breasts, meatballs, sausages, strips, patties, nuggets, and tenders that are seasoned and ready to serve after a quick stop in the microwave, oven, or skillet.

Unfortunately, like the saltwater solution that's added to some raw poultry, that seasoning almost always means an extra slug of salt. Here's a guide to the best no-prep poultry.

The information for this article was compiled by Lindsay Moyer.



**Seasoned...and ready in minutes.**

The downside: salt. Only one product—Trader Joe's Grilled Balsamic Vinegar & Rosemary Chicken—met our sodium limit for a Best Bite (250 milligrams per serving). But that's only if you end up with a 3 oz. portion. (The pieces don't come in a uniform size.)

We did find a handful of Honorable Mentions (no more than 350 mg of sodium). Among the tastiest: grilled chicken breasts or breast fillets by Bell & Evans, Nature's Rancher, Nature Raised, and Tyson. Tyson Grilled & Ready Sweet Asian Chicken Thigh Fillets was also a crowd pleaser.

Fast Fixin' Flame Roasted Chicken Breasts would have earned a Best Bite (and Foster Farms Rotisserie Breast Fillets would have been an Honorable Mention) if each breast weighed 3 oz. (instead of 5 oz.).

And Perdue's (raw) Italian Style and Jamaican Style Jerk Perfect Portions (with 360 mg of sodium in a 5 oz. serving) each just missed an Honorable Mention, but would probably earn one after they lose some sodium during cooking.

### The Best Breasts

It doesn't take more than 10 minutes to season and broil, sauté, or stir-fry a package of fresh boneless chicken breasts. But sometimes that's 10 minutes too many.

Solution: let Bell & Evans, Perdue, Tyson, or another company do the seasoning...and (in some cases) the cooking.



**Juicy and "meaty" ...with no added salt.**

### Better Burgers

"40% less fat and 30% fewer calories than USDA data for broiled ground beef patties," boasts the box of Perdue Short Cuts Spinach & Roasted Garlic Chicken Burgers.

True enough. Almost any chicken or turkey burger is leaner than one made of "regular" (30% fat) ground beef, which has 230 calories and 6 grams of saturated fat—almost a third of a day's worth—in a 3 oz. cooked patty. Even "10% fat" beef burgers have more sat fat (4 grams) than the same size chicken or turkey burgers (around 2 grams).

And red meats like beef and pork—but not white meats like chicken and turkey—are linked to a higher risk of heart disease, diabetes, and colorectal cancer. (See "Six Reasons to Eat Less Red Meat," *Nutrition Action*, June 2013, cover story.)

If you want no added salt, go for Jennie-O Lean Turkey Burger Patties and their surprisingly beef-like flavor. Other mmm-worthy Best Bites: Bell & Evans and Weight Watchers Chicken Burgers. We found Applegate's no-salt-added Organic Turkey Burgers a tad dry.

Among the Honorable Mentions, Jennie-O Extra Lean Seasoned White Turkey Patties and Trader Joe's Turkey Burgers deserve a shot on your plate. And Trader Joe's Chile Lime Chicken Burgers wowed taste buds with their onions, bell peppers, garlic, cilantro, and red pepper flakes.

Looking for a breaded burger?

Expect the protein in most patties to drop (from roughly 22 grams to 12 grams) and the carbs to climb to about what you'd get in a small (1 oz.) slice of bread (which wouldn't matter much if people didn't eat their patties on a hefty bun). That's largely because the breading replaces some chicken with white flour (or corn and/or rice flour in gluten-free breaded patties).

Our only breaded Best Bites—Applegate Chicken Patties and Trader Joe's Breaded Chicken Tenderloin Breasts—were crisp on the outside and juicy on the inside. Yum.





**Toss into a salad or stir-fry.**

of strips from Hormel, Perdue, or most Tyson varieties is packed with 400 to 600 milligrams of sodium. Butterball Everyday chicken or turkey breast strips hit around 750 mg (half a day's limit for most adults).

If Trader Joe's Just Chicken, which has no added salt, doesn't do it for you, try our favorite strips: Nature's Rancher. The succulent Best Bite (with just 180 mg of sodium) is sold at Whole Foods. If you can't find it, any of our Honorable Mentions would please your palate...and dispatch 15 to 25 grams of protein to your muscles.

## Strip Tease

What's not to like about fully cooked chicken or turkey breast strips, slices, and cubes?

A 3 oz. serving is low in calories (roughly 100) and saturated fat (1 gram or less). They're convenient (eat them right out of the bag or after a brief stop in the microwave). And they're versatile (toss some into a salad, stir-fry, or sandwich).

The problem—no surprise here—is salt. A 3 oz. serving

## New Nuggets

Nuggets and tenders are polishing their image. But some upgrades matter more than others:

■ **Whole grain.** You get all or mostly whole grain in Nature Raised's delicious Whole Grain Breast Nuggets and Trader Joe's Chicken Drummellas (both Best Bites), and in FreeBird Whole Grain Popcorn Chicken (an Honorable Mention). Bravo!

Despite the name (and the Honorable Mention), Banquet Whole Grain Chicken Breast Strips are a mix of whole and white flour. Ditto for "whole grain" (and higher-sodium) nuggets and tenders from Perdue, Pilgrim's, and Tyson.

■ **Lightly breaded.** Get ready for fewer calories and less white flour. A 3 oz. serving of Tyson Lightly Breaded Chicken Breast Strips, for example, has 150 calories—40 less than the company's Crispy Chicken Strips.

In contrast, many gluten-free nuggets and tenders don't cut carbs or calories. They just swap wheat flour for rice and/or corn flour. If you can't eat gluten, try Ian's Breaded Chicken Tenders, our only gluten-free Best Bite. (Tyson Gluten Free Breaded Chicken Breast Strips missed a Best Bite by just half a gram of saturated fat.)



**100% whole grain outside, 100% juicy inside.**

## Hot Links

The good news: chicken and turkey dinner sausages have at least 50 percent less saturated fat than their beef and pork cousins.

And a growing list of companies—like Aidells, Al Fresco, Applegate, Brat Hans, Trader Joe's, and Wellshire—don't use sodium nitrite to cure their sausages. (Nitrites may raise the risk of colorectal cancer by forming N-nitroso compounds in the gut.)

The bad news: there's no way to tell if you're getting less nitrites from the naturally occurring *nitrites* in the celery juice powder that replaces sodium nitrite in many "no nitrates or nitrites added" sausages.

Then there's sodium, which typically ranges from 400 to 1,000 milligrams per link. That explains why we have no Best Bites.

And our only two Honorable Mentions—Trader Joe's Sun-Dried Tomato and Sweet Apple Chicken Sausage—only won because each link is small (2.4 oz.). Ounce for ounce, Al Fresco Chipotle Chorizo and Spinach & Feta and Brat Hans Sweet Apple, Organic Apple, and Sun-Dried Tomato & Basil Chicken Sausages are in the same ballpark, but their larger (3 oz.) size puts their sodium (400 to 440 mg) over our limit.



**Less sodium, in part because they're smaller.**

## Meatball Makeover

When it comes to meatballs, chicken and turkey beat beef. They've got just 2 to 4 grams of saturated fat in a 3 oz. serving (typically 3 or 4 meatballs). That's about half what you'd get in beef meatballs.

Poultry meatballs can be fattier than (unbreaded) strips or breasts if they contain dark meat and skin. You can dodge the skin (but not the dark meat) if you look for "chicken meat" or "skinless chicken meat," not simply "chicken," in the ingredients list. Ditto for turkey.

Salt is tougher to sidestep. We found only two Honorable Mentions—Foster Farms Homestyle and Italian Style Turkey Meatballs. Both earned our tasters' seal of approval.

Looking for less-traditional flavors? Al Fresco's Tomato & Basil and Teriyaki Ginger Chicken Meatballs hover around 400 mg of sodium. Pick another brand and the sodium will likely hit 600 mg. 🍷



**Lowest in sodium, not taste.**



# Checkin' Chicken

**Best Bites** (✓✓) and **Honorable Mentions** (✓) contain no more than 3 grams of saturated fat. Best Bites also have no more than 250 milligrams of sodium. Honorable Mentions can have up to 350 mg. Items are ranked from least to most sodium, then most to least protein, then least to most calories.

Unless noted, products are frozen.

	Calories	Saturated Fat (g)	Sodium (mg)	Protein (g)
<b>Breasts &amp; Thighs—unbreaded</b> (cooked, unless noted)				
✓✓ Chicken breast meat (3 oz.)*	140	1	60	26
✓✓ Trader Joe's Balsamic & Rosemary (3 oz.) <sup>R</sup>	100	0.5	250	17
✓ Trader Joe's Pollo Asado Autentico, raw (4 oz.) <sup>R</sup>	110	0	280	21
✓ Bell & Evans Grilled Breasts (2.8 oz.) <sup>1</sup>	100	0	290	22
✓ Tyson Grilled & Ready—Breast Fillets (3.5 oz.) or Sweet Asian Thigh Fillets (3 oz.) <sup>1</sup>	130	1	310	19
✓ Perdue Fit & Easy Dry Rubbed, raw (3 oz. cooked) <sup>1,R</sup>	140	0	340	23
✓ Nature's Rancher Grilled Breast (5 oz.)	220	1	350	38
✓ Nature Raised Grilled Breast Fillets (3 oz.)	90	0	350	16
Perdue flavored Perfect Portions, raw (4.8 oz.) <sup>1,R</sup>	140	0	360	27
Fast Fixin' Flame Roasted Breasts (4.9 oz.)	170	1	410	28
Foster Farms Rotisserie Breast Fillets (4.5 oz.)	150	0.5	460	32
<b>Strips &amp; Slices—unbreaded</b> (3 oz. cooked)				
✓✓ Trader Joe's Just Chicken <sup>R</sup>	110	0	60	25
✓✓ FreeBird Breast Strips	120	0.5	180	21
✓✓ Nature's Rancher Grilled Strips	120	0.5	180	21
✓ Brat Hans Organic Breast Strips <sup>R</sup>	100	0	290	24
✓ Applegate Grilled Breast Strips <sup>1,R</sup>	100	0	320	20
✓ Tyson Grilled & Ready—Oven Roasted Diced Breast or Southwestern Breast Strips <sup>1,R</sup>	120	1	320	20
✓ Harvestland Breast Strips, froz. or refrig. <sup>1</sup>	90	0	340	17
✓ Trader Joe's Just Grilled Chicken Strips	90	0	340	16
✓ Nature Raised Grilled Breast Strips	90	0	350	16
Perdue Simply Smart Original Grilled Strips	110	0.5	400	20
Tyson Grilled & Ready, frozen or refrigerated, except refrig. Oven Roasted Diced Breast and Southwestern Breast Strips <sup>1</sup>	100	0.5	490	19
Perdue Short Cuts Carved Breast <sup>1,R</sup>	110	0.5	500	20
Hormel Natural Choice Carved Breast <sup>1,R</sup>	90	1	580	18
Butterball Everyday Breast Strips <sup>1,R</sup>	90	1	760	18
<b>Burgers—unbreaded</b> (1 patty, raw unless noted)				
✓✓ Applegate Organic Turkey (3 oz. cooked)	140	2	60	17
✓✓ Jennie-O Lean Turkey (4 oz.) <sup>R</sup>	180	2.5	100	21
✓✓ Weight Watchers Chicken (4 oz.)	140	1	120	25
✓✓ Bell & Evans Chicken (4 oz.)	160	1.5	140	21
✓ Jennie-O Extra Lean Turkey (4 oz.) <sup>R</sup>	140	1	270	24
✓ Trader Joe's Turkey (4 oz.)	180	2.5	280	22
✓ Nature's Rancher Turkey (5.3 oz.)	220	3	310	27
✓ Trader Joe's Chile Lime Chicken (4 oz.)	150	2	310	19
✓ Butterball Everyday Fresh Turkey (4 oz.) <sup>1,R</sup>	170	3	320	22
Perdue Short Cuts Chicken, cooked (3 oz.) <sup>1,R</sup>	160	2.5	470	15
Butterball Everyday Turkey (5.3 oz.) <sup>1</sup>	240	3	570	31
<b>Cutlets, Breasts, &amp; Patties—breaded</b> (1 piece, cooked unless noted)				
✓✓ Trader Joe's Tenderloin Breasts (2.3 oz.)	110	0.5	180	10
✓✓ Applegate Patties (3 oz.)	180	1.5	210	12
✓ Fast Fixin' Breast Patties (2.5 oz.)	150	1	260	8

	Calories	Saturated Fat (g)	Sodium (mg)	Protein (g)
✓ Bell & Evans Patties, raw (4 oz.)	240	3	300	19
✓ Yummy Breast Patties (2.8 oz.)	170	1	320	12
✓ Banquet—regular or Breast Patties (2.4 oz.) <sup>1</sup>	170	1.5	320	9
✓ Golden Platter Gluten Free Patties (3 oz.)	170	2	340	16
✓ Tyson Spicy or Foster Farms Patties (2.7 oz.) <sup>1</sup>	190	3	340	10
Tyson Patties (2.7 oz.)	200	3	400	9
Perdue Simply Smart Breast Cutlets (3.2 oz.)	160	1	480	17
Perdue Whole Grain Cutlets (3 oz.) <sup>1,R</sup>	180	2	510	13
<b>Nuggets &amp; Tenders—breaded</b> (No. closest to 3 oz., cooked unless noted)				
Tyson Gluten Free Breast Strips (NA)	190	3.5	180	14
✓✓ Ian's Tenders, raw (NA)	160	0.5	210	20
✓✓ Applegate Nuggets (7)	180	1.5	210	12
✓✓ Applegate Homestyle Breast Tenders (2)	150	1	230	12
✓✓ Trader Joe's Drummellas (4)	190	2	240	15
✓✓ Tyson Honey Breast Tenders (5)	220	3	240	13
✓✓ Nature Raised Whole Grain Nuggets (4)	180	2	240	12
✓ Bell & Evans Breast Nuggets, raw (NA)	170	1	270	16
✓ Bell & Evans Breast Tenders—Coconut or Gluten Free, raw (NA) <sup>1</sup>	160	0.5	300	15
✓ Ian's Nuggets, raw (5)	200	1	310	13
✓ Fast Fixin'—Breast Nuggets (6) or Strips (3) <sup>1</sup>	180	1.5	310	9
✓ FreeBird Whole Grain Popcorn Chicken (12)	160	1	330	18
✓ Banquet Whole Grain Breast Strips (2)	200	1.5	330	11
✓ Golden Platter Gluten Free—Nuggets (5) or Tenders (2.5) <sup>1</sup>	170	2	340	16
✓ Applegate—Organic Strips (3) or Gluten-Free Nuggets (7) or Breast Tenders (2) <sup>1</sup>	160	1	350	12
Bell & Evans Breast Tenders, raw (NA)	160	1	360	15
Tyson Lightly Breaded Breast Strips (NA)	150	1.5	370	16
Pilgrim's Whole Grain Breast Tenders (3)	220	3	420	15
Perdue Simply Smart, froz. or refrig. (NA) <sup>1</sup>	160	1.5	440	15
Perdue Whole Grain—Nuggets, Strips, or Tenders, froz. or refrig. (NA) <sup>1</sup>	190	2	450	12
Tyson Crispy Strips (NA)	190	1.5	480	15
Tyson Whole Grain Breast Chunks (NA)	210	2	550	17
<b>Dinner Sausages</b> (3 oz. cooked link, unless noted)				
✓ Trader Joe's Chicken—Sun-Dried Tomato or Sweet Apple (2.4 oz.) <sup>1,R</sup>	120	2	340	11
Brat Hans Chicken—Organic Apple, Sweet Apple, or Sun-Dried Tomato & Basil <sup>1,R</sup>	160	2.5	410	14
Al Fresco Chicken <sup>1,R</sup>	140	2	470	15
Applegate Organics <sup>1,R</sup>	130	2	520	14
Wellshire Turkey Andouille <sup>R</sup>	170	2.5	580	17
Aidells Smoked Chicken <sup>1,R</sup>	170	3.5	650	13
Johnsonville Turkey (2.3 oz.) or Chicken <sup>1,R</sup>	160	3	790	12
Trader Joe's Smoked Andouille (3.2 oz.) <sup>R</sup>	180	2.5	960	21
<b>Meatballs</b> (No. closest to 3 oz. cooked)				
✓ Foster Farms Turkey, froz. or refrig. (3) <sup>1</sup>	160	2.5	310	17
Al Fresco Chicken (4) <sup>1,R</sup>	190	3	400	17
Jennie-O Turkey (3) <sup>1</sup>	180	4	420	16
Butterball Everyday Dinner Sized Turkey (3) <sup>1</sup>	190	3.5	630	14
Aidells (4) or Brat Hans (5) Chicken <sup>1,R</sup>	180	3.5	650	14
✓✓ Best Bite. ✓ Honorable Mention. <sup>1</sup> Average. <sup>R</sup> Refrigerated. NA Number not available. *For comparison.				
<b>Daily Limits</b> (for a 2,000-calorie diet): <b>Saturated Fat:</b> 20 grams. <b>Sodium:</b> 1,500 milligrams. <b>Protein Daily Target:</b> 75 grams.				
Source: company information. The use of information from this article for commercial purposes is strictly prohibited without written permission from CSPI.				

## RIGHT STUFF

### GET FRESH



"Watch Out! There's a new cheese on the block," says the online description of

#### Elli Quark.

Quark may be new to Americans (so new that Elli may not have reached your area yet), but Europeans and Canadians have

been enjoying it for years. It's a "fresh, smooth cheese," as Elli's label notes. But to most people, it will probably seem more like a greek yogurt or sour cream. In fact, it's got live active cultures, just like yogurt.

Choose a 6 oz. **Plain**—a perfect companion for your fresh berries, peaches, or other fruit—and you pocket 17 grams of protein plus 15 percent of a day's calcium for only 90 fat-free calories. And quark has enough tang to stand in for sour cream on baked potatoes or other dishes.

Go with the **Pineapple** or **Strawberry**—or the (fruit-poor) **Lemon** or **Red Velvet**—and you walk away with nearly the same numbers. But unlike yogurts that are sweetened with sugar or with the questionable artificial sweeteners acesulfame potassium, aspartame, and/or sucralose, Elli uses only stevia (a plant extract) and the sugar alcohol erythritol.

Both are rated "safe" by the Center for Science in the Public Interest, *Nutrition Action's* publisher (see [ChemicalCuisine.org](http://ChemicalCuisine.org)). Some people detect a slightly bitter aftertaste when they eat stevia. If that's you, switch to plain Elli and reach for some blueberries or banana.

"Crave What's Simple," says the label. "At Elli, we believe in using simple ingredients to create nutritious foods that fill you up without the empty calories of added sugars." Sweet!

[elliquark.com](http://elliquark.com)—(855) 998-3554

## FOOD PORN

### BIG MAC

"Creamy mac & cheese spiced up with tender braised pork and our own sweet tangy barbecue sauce." That's how **Noodles & Company** describes its **Barbecue Pork Mac**.

The "fresh food fast" chain made the Pork Mac its "Featured Dish" earlier this year. And what a feature it is.

The pork supplies "healthy, lean protein," according to Noodles' Web site. Well, something happened to that piggy on the way to market, because each regular-size bowl of Pork Mac has 1,270 calories and 29 grams (1½ days' worth) of saturated fat plus 1,960 milligrams of sodium (more than a day's supply). It's about equal to two McDonald's Quarter Pounders with Cheese plus a small order of fries.

In the mood for beef instead?

Noodles' **Steak Stroganoff** is a bowl of egg noodles topped with "marinated steak, mushroom sherry cream sauce, fresh herbs, cracked pepper, sautéed mushrooms," and parmesan cheese. A regular size will set you back 1,030 calories, 24 grams of sat fat, and 1,620 mg of sodium.

Our advice: skip Noodles' noodles. Instead, try a salad like the Spinach & Fresh Fruit (drop the bacon) or the Chinese Chicken Chop (axe the sprouts; raw sprouts have been implicated in 30 food poisoning outbreaks since 1996).

Both are too high in salt, but at least you're getting some veggies instead of a big bowl of white flour, meat, cheese, etc.

Now *that's* using your noodle.

[noodles.com](http://noodles.com)—(866) 956-6635



## dish OF THE MONTH



### The Simplest Sautéed Chicken

Heat 2 Tbs. olive oil in a large nonstick skillet over medium-high heat until hot. Sauté 1 lb. boneless, skinless chicken breasts until browned, about 4 minutes a side. Remove from pan. Sauté 4 sliced cloves garlic and ½ tsp. fresh thyme for 30 seconds. Top the chicken with the garlic and thyme and a squeeze of fresh lemon.

## quick tip

**The 2-2-4 rule for leftovers:** Move the food from the oven to the refrigerator in **2** hours or less. Store in the refrigerator at a shallow depth—about **2** inches—to speed chilling. Eat in **4** days or less (or freeze).