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Nutrition Action HEALTH LETTER®
SEPTEMBER 2011 $2.50
CENTER FOR SCIENCE IN THE PUBLIC INTEREST

Multiplex

What you need to know about multivitamins

BY DAVID SCHARDT

"I was gardening for hours, cleaning out closets, energy, energy, energy!" The 49-year-old woman from the Midwest gushed on amazon.com about the multivitamin she had been taking for all of one week. "I thought about it and realized it was the vitamins. I feel so much better overall than I've felt in several years. I will always take these."

She's certainly not alone. One in three Americans say they take multivitamins and minerals regularly, downing 1 to 14 pills a day at a cost that can hit $75 a month.

Do multivitamins provide any tangible benefits? Can you get too much of any nutrients from a multi? And, if you're in the market for one, what should you be looking for?

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MEMO FROM MFJ

Meat & Heat

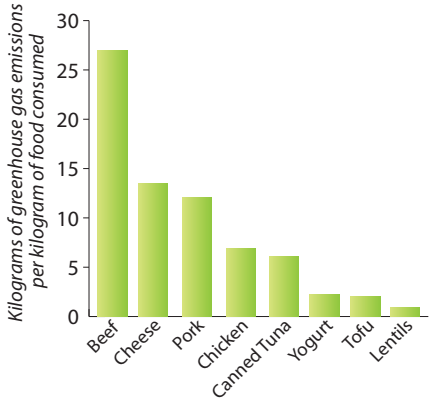
It felt like an oven outside. In July, a massive heat wave baked half of the United States. Other recent extreme weather events include severe droughts in Africa, Russia, France, China, and Texas and epic floods in Pakistan, Australia, Colombia, and the Mississippi River Valley. It's precisely the kind of extreme weather that climate scientists predicted.

"And all this is happening with just 1.4 degrees of warming," noted Manish Bapna and Jennifer Morgan of the World Resources Institute in *The Washington Post*.

Scientists predict that "the planet's average temperature could rise as much as 11.5 degrees by the end of the century," they added. "The consequences are hard to imagine."

What does food have to do with climate?

The nonprofit Environmental Working Group (EWG) has published an eye-opening report, "Meat Eater's Guide to Climate Change + Health." The report includes a detailed accounting of the greenhouse gas emissions due to common protein foods and vegetables.



Meat and other animal foods generate far more greenhouse gases than other sources of protein. *(Source: EWG)*

Meat and other animal foods—except milk—generate far more greenhouse gases than commonly eaten plant foods. Going vegetarian would reduce America's greenhouse gas emissions by 4.5 percent. That's modest, but every bit helps.

After lamb (which isn't widely consumed here), beef accounts for the next-highest emissions. That's largely because cattle emit copious amounts of methane, a potent greenhouse gas.

Also, most cattle are fed large amounts of corn and other feedstuffs that are grown with huge amounts of nitrogen fertilizer. Producing that fertilizer generates enormous quantities of carbon dioxide, a greenhouse gas. And when the fertilizer breaks down in the soil, nitrous oxide is created. Nitrous oxide is 300 times more potent than carbon dioxide in causing global warming. Decaying manure leads to yet more methane and nitrous oxide.

Growing, transporting, storing, and eating *any* food results in some greenhouse gases. However, eating a more plant-based diet would curb emissions. EWG calculates that if a four-person family skipped steak one day a week for a year, the impact would be equivalent to taking their car off the road for nearly three months.

I stopped eating beef 25 years ago for health reasons. (I never ate much pork.) And I stopped eating poultry 15 years ago out of concern for the animals' welfare. I'd like to think that my decision has lowered my blood cholesterol levels and spared a few cows and many chickens the ignominy of being raised in miserable confinement and then killed (sometimes not as painlessly as the meat industry would like us to believe).

I didn't think much about meat's environmental damage until I wrote *Six Arguments for a Greener Diet* in 2006. Now that weather extremes are multiplying, it's hard *not* to think about that.

"Scientists have been warning us for quite some time—in increasingly urgent tones—that things will get much, much worse if we continue the reckless dumping of more and more heat-trapping pollution into the atmosphere," former vice president Al Gore wrote recently in *Rolling Stone*.

"What hangs in the balance is the future of civilization as we know it."

Mike Jacobson

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The Center for Science in the Public Interest (CSPI) is the nonprofit health-advocacy group that publishes Nutrition Action Healthletter. *CSPI mounts educational programs and presses for changes in government and corporate policies.*

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SEPTEMBER 2011
Volume 38 Number 7

Nutrition Action Healthletter (ISSN 0885-7792) is published 10 times a year (monthly except bi-monthly in Jan./Feb. and Jul./Aug.).

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

Application to mail at Periodical postage rates approved at post office of Washington, DC, and at additional offices.

Subscriber Services

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CENTER FOR Science IN THE Public Interest

Multiplex

What you need to know about multivitamins

Chances are, there's a bottle of multivitamins in your medicine cabinet. Maybe you take one every day. Maybe only once in a while.

Do you need a multi? There's not much evidence that people who take them are any healthier. Then again, a little insurance against something that may be missing from your diet couldn't hurt.

Our advice: don't waste your money on a multivitamin that has more than you may need...or should get. Here's our guide.

Study after study finds little or no long-lasting benefit from taking a daily multivitamin-and-mineral:

■ Among more than 182,000 middle-aged and older men and women living in California and Hawaii, those who took multivitamins lived no longer and were no less likely to be diagnosed with cardiovascular disease or cancer than those who didn't take a multi.[1]

■ The 41 percent of the more than 161,000 postmenopausal women in the Women's Health Initiative Cohorts who were taking a multivitamin were just as likely to be diagnosed with breast, ovarian, colorectal, or another cancer as those who didn't take a multi.[2]

■ One-quarter of the more than 83,000 men aged 40 to 84 in the Physicians' Health Study were taking multivitamins. They were just as likely to die from coronary heart disease or stroke as the men who didn't take a multi.[3]

Even when researchers look for more modest benefits, proof is elusive.

For example, healthy older adults who were given multivitamins in the United States, Canada, Scotland, France, and the Netherlands for up to 1½ years were just as likely to get colds or other infections, stay sick just as long, or miss out on planned activities as similar people who were given a placebo.[4-8]

And performances on memory and cognitive tests were no higher in healthy German women aged 60 to 91 who took a multivitamin for six months, or in healthy Scottish men and women 65 and older who took a multi for 12 months, than in those who were given a placebo.[9,10]

Dietary Insurance?

Even if multivitamins won't prolong your life or keep you from getting sick, "they can still fill in the gaps if you get too little of some vitamins and minerals from your food," says Susan Roberts, a professor of nutrition and of psychiatry at Tufts University in Boston and author of "The 'I' Diet."

The U.S. Dietary Guidelines Advisory Committee last year singled out seven nutrients that many Americans consume too little of. Two of them—fiber and potassium—aren't available in significant amounts from multivitamins, but the other five are:

■ **Vitamin D.** A majority of adults don't get enough from their food (though our skin makes vitamin D when it's exposed to the UV rays in sunlight).

■ **Folic acid.** It helps protect against spina bifida and other neural tube birth defects that can occur before a woman knows that she is pregnant. About one in five women who are capable of becoming pregnant don't get enough folic acid.

■ **Vitamin B-12.** Adults over 50 should get some of their B-12 from fortified foods or supplements, since they may have too little stomach acid to absorb naturally occurring B-12 in foods.

■ **Iron.** About 15 percent of women 50 and younger are iron deficient.

■ **Calcium.** A majority of adults don't get enough calcium from their food. Multivitamins—which typically have 100 to 200 milligrams—can help, though adults need 1,000 to 1,200 mg a day.

Risky?

Is there a downside to taking a multivitamin every day?

For most nutrients, the answer is no. Popular brands like Centrum and One A Day, for example, usually stick to levels that pose no risks.

However, researchers are concerned about the safety of three nutrients.

Folic acid. Folate is a B vitamin that helps cells divide and grow. That's why too little can cause anemia and birth defects like spina bifida.

In 1996, the Food and Drug Administration tried to lower the risk of birth defects by requiring companies to add folic acid (a form of folate) to rice and to the flour that's used to make white bread and pasta. Most companies also added folic acid to their breakfast cereals.

It worked. Since fortification began, the rate of neural tube birth defects in the United States has plunged by 36 percent.

But some researchers fear that folate for adults is a double-edged sword.

On the one hand, too little may raise the risk of colorectal cancer because the vitamin can prevent mutations that lead to tumors.

"If you chronically don't get enough folate, you have an increased risk of colon cancer," says Joel Mason, director of the Vitamins and Carcinogenesis Laboratory at the Human Nutrition Research Center on Aging at Tufts University.

But too much folic acid may spur the growth of precancerous colorectal adenomas, adds Mason, who notes that a third to half of Americans over age 50 have those kinds of adenomas.[11]

In a 2007 study, researcher John Baron and his colleagues gave either a placebo or 1,000 micrograms of folic acid every day for six to eight years to men and women who had adenomas in the past. "That's quite a high dose," notes Baron, who is a professor of medicine at the University of

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North Carolina School of Medicine.

The folic acid takers were more than twice as likely to develop three or more of the precancerous lesions as the placebo takers.[12]

"The men who took folic acid supplements were also three times more likely to be diagnosed with prostate cancer," adds Baron.

A 2010 meta-analysis of eight trials on nearly 37,500 people calmed some fears. It found no higher risk of cancers in people given very high doses of folic acid (typically 2,000 mcg a day) for two to seven years.[13] But the studies in the meta-analysis may not have lasted long enough to resolve the issue.

"While it might be expected that a change in folic acid intake would affect adenoma risk in about five years, invasive cancer takes longer," says Baron. "To be reassuring, you'd have to see what happens over 10 to 15 years."

In the meantime, you can play it safe by keeping a lid on your intake.

"The available evidence strongly suggests that if there is some danger to the general public, it probably only exists for people who are taking in more than 800 to 1,000 micrograms a day from fortified foods or supplements," says Mason. The folate that occurs naturally, mostly in fruits and vegetables, isn't a problem.

A new study adds evidence that modest intakes are safe. The American Cancer Society tracked nearly 100,000 men and women for eight years. Those who got the most folic acid (an average of 660 mcg a day) from supplements and fortified foods were no more likely to be diagnosed with colorectal cancer than those who got the least (70 mcg a day).[14]

"It's good news for those who want to take a multivitamin every day," says Mason.

Most multis contain 400 mcg of folic acid. "You're probably getting about 250 micrograms a day from fortified bread, pasta, rice, and cereals," adds Mason. "So if you have a typical diet and you take a multivitamin, you're getting 650 micrograms, which is probably safe."

How could a person get too much folic acid?

While most breakfast cereals have 100 to 200 mcg, some—like Kashi Heart to Heart, General Mills' Total, Multigrain Cheerios, and Kellogg's Müeslix, Product 19, Smart Start, and Special K Original—have 400 mcg. And that assumes that you pour yourself only the serving size listed on the label, which ranges from two-thirds of a cup to one cup.

"If you're taking a multivitamin and eating cereals that contain high doses of folic acid every day, then it's not that hard to exceed 1,000 micrograms a day," cautions Mason.

If you take a daily multivitamin, avoid cereals—like Kashi Heart to Heart—that contain 100% of the Daily Value for folic acid in each serving.

Our advice: if you take a multivitamin, avoid cereals, energy bars, or other foods or supplements that contain 400 mcg of folic acid per serving. (If they have that much, the Nutrition Facts panel on the label will list the amount of folic acid as "100% DV.")

And if you're still nervous about excess folic acid (and are not at risk of becoming pregnant), take your multi every other day.

Selenium. Selenium can prevent some tumors in laboratory animals, but its record in people has been disappointing.

In a large National Cancer Institute trial, men who took 200 micrograms of selenium—about four times the recommended level—every day for five years had no lower risk of prostate cancer than men who took a placebo.[15]

"But it may have increased their risk of being diagnosed with diabetes," says epidemiologist Alan Kristal of the Fred Hutchinson Cancer Research Center in Seattle.

And in an earlier trial, men and women who took 200 mcg of selenium every day for almost eight years were nearly three times as likely to report having diabetes as those who took a placebo.[16]

That led the American College of Physicians to warn that "long-term selenium supplementation should not be viewed as harmless and a possibly healthy way to prevent illness."[17]

Yet a daily dose of some multivitamins—like GNC's Mega Men supplements—still pack 200 mcg of selenium. ("No comment" was all we got when we asked GNC why.)

Our advice: don't take a multivitamin with more than about 100 mcg of selenium.

Vitamin A. In 2002, Harvard researchers reported that women who consumed at least 6,667 IU of vitamin A (retinol) a day from their food and supplements had almost double the risk of hip fracture of women who consumed less than 1,667 IU a day.[18]

But since then, four studies that followed 115,000 women in three countries for four to 10 years failed to confirm a link between vitamin A and bone fractures.[19-22]

"We are finding that vitamin A is not as big a concern as earlier studies suggested," says Sarah Morgan, director of the Osteoporosis Prevention and Treatment Clinic at the University of Alabama in Birmingham.

"We tell our patients not to get more than 100 percent of the Daily Value for vitamin A from supplements, and to make sure that at least some of their vitamin A is in the form of beta-carotene, which gives people some built-in protection," says Morgan.

(The Daily Value for vitamin A is 5,000 IU. Beta-carotene, which our bodies convert to vitamin A, wasn't linked to the risk of fracture in the Harvard study.)

[1] *Am. J. Epidemiol. 173*: 906, 2011.
[2] *Arch. Intern. Med. 169*: 294, 2009.
[3] *Arch. Intern. Med. 162*: 1472, 2002.
[4] *J. Am. Geriatr. Soc. 55*: 35, 2007.
[5] *BMJ 331*: 324, 2005.
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[7] *JAMA 288*: 715, 2002.
[8] *Int. J. Vitamin Nutr. Res. 63*: 11, 1993.
[9] *Prev. Med. 41*: 253, 2005.
[10] *Nutr. J. 6*: 10, 2007.
[11] *Cancer Epidemiol. Biomarkers Prev. 16*: 1325, 2007.
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[13] *Arch. Intern. Med. 170*: 1622, 2010.
[14] *Gastroenterol.* doi:10.1053/j.gastro.2011.04.004.
[15] *JAMA 301*: 39, 2009.
[16] *Ann. Intern. Med. 147*: 217, 2007.
[17] *Ann. Intern. Med. 147*: I14, 2007.
[18] *JAMA 287*: 47, 2002.
[19] *Osteoporos. Int. 15*: 552, 2004.
[20] *Osteoporos. Int. 15*: 872, 2004.
[21] *J. Bone Mineral Res. 20*: 913, 2005.
[22] *Am. J. Clin. Nutr. 89*: 323, 2009.

Photo: Jorge Bach.

Before You Buy

The simple multivitamin has morphed into a slew of "formulas" that are targeted at seniors, women, men, teens, and athletes, among others. Some promise to lower your cholesterol levels or boost your immunity, others to give you energy or even lower your risk of colon, breast, and prostate cancer.

Most of that is marketing hype. If you're shopping for a multivitamin, here are some things you need to know:

■ **Not all multis are well made.** "Multivitamins vary widely in quality," says Tod Cooperman of ConsumerLab.com, a Web site that analyzes dietary supplements. Its recent survey of popular multivitamins found problems with about a third of the 35 it tested. A few examples:

—Centrum Chewables contained almost twice as much vitamin A as its label claimed.

—All One Active Seniors had less than 2 percent of the beta-carotene listed on its label.

—Hero Nutritionals Yummi Bears for children exceeded the Institute of Medicine's upper limits for vitamin A and zinc.

A list of the multivitamins in the survey (plus 22 more that were analyzed later at the request of the manufacturers) is available at ConsumerLab.com, but only subscribers ($33 a year) can see the results.

■ **A quality-assurance seal helps.** If the label carries a USP (U.S. Pharmacopeia) or NSF (National Sanitation Foundation) seal, you can be sure that the multivitamin contains what the label says and that it disintegrates fast enough. Many companies aren't willing to pay the USP's or NSF's fees, though. So the absence of a seal doesn't mean that a multi isn't well-made.

■ **Some multivitamins have trivial amounts of some ingredients.** The lutein in Costco's Kirkland Signature Daily Multi helps support "eye health." But the multi's 250 micrograms of lutein are no more than 4 percent of what may protect vision. And Your Life Multi Men's 45+ from Nature's Bounty boasts about its fish oil, but contains less than 2 percent of what may help prevent heart attacks.

■ **Don't count on your multi to keep your cholesterol down.** While the kind of phytosterols that is added to some brands of yogurt, margarine, and mayonnaise can lower LDL ("bad") cholesterol, there's little evidence that the kind that is packed into some multivitamins—Centrum Cardio and One A Day Cholesterol Plus, for example—can do the same. Last year, the Food and Drug Administration announced that it intends to stop multivitamins with phytosterols from making cholesterol-lowering claims. Unfortunately, it's giving companies until the end of 2012 to comply.

■ **"Whole food" multivitamins aren't necessarily better.** Most get their nutrients from yeast (that's the "whole food") plus synthetic vitamins. There's little evidence that whole-food vitamins are absorbed any better than regular vitamins. In fact, some nutrients—like beta-carotene and vitamin B-12—are *better* absorbed from supplements than from food.

■ **Don't fall for "Energy" multivitamins.** One A Day Women's Active Mind & Body relies on caffeine for its kick. Others, like Rainbow Light Men's One Energy Multivitamin, resort to the industry-promoted myth that B vitamins give you more energy.

■ **Chewable, liquid, and gummy multivitamins have fewer nutrients.** The extra sugar and water crowd out some vitamins and minerals. Natrol Liquid My Favorite Multiple, for example, is missing vitamin K, iron, zinc, selenium, chromium, and copper, among other nutrients.

■ **Ignore "clinically proven" claims.** There's no standard definition, so they can mean anything...or nothing. GNC prints "clinically studied" on the front of its multivitamins, but won't reveal what was studied or what the studying found. "We do not publish the results," is all the company would tell us. That's helpful.

■ **You don't need to pay more than 10 cents a day for a good-quality multivitamin.** "There is almost no connection between the price and the quality of multivitamins," notes ConsumerLab.com's Tod Cooperman. Many inexpensive multivitamins (3 to 15 cents for a daily dose) passed ConsumerLab's recent quality tests, while several much more expensive brands failed.

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What your MULTIVITAMIN Should Contain

Vitamin A	*no more than* 4,000 IU
Beta-Carotene	*no more than* 5,000 IU
Vitamin C	60-1,000 mg
Vitamin D	400 IU *or more*
Vitamin E	20-100 IU
Vitamin K	10 mcg *or more*
Thiamin (B-1)	1.2 mg *or more*
Riboflavin (B-2)	1.7 mg *or more*
Niacin (B-3)	16-35 mg
Vitamin B-6	2-100 mg
Folic Acid	*no more than* 400 mcg
Vitamin B-12	6 mcg *or more*
Calcium	don't rely on a multi
Iron	*no more than* 10 mg
Phosphorus	*no more than* 350 mg
Magnesium	50-350 mg
Zinc	*no more than* 30 mg
Copper	0.9-10 mg
Selenium	20-110 mcg
Chromium	35 mcg *or more*

Men: your multi should have no more than around 200 mg of calcium.

Premenopausal Women: your multi should have 18 mg of iron.

Note: *"or more"* doesn't mean that a nutrient is safe at any dose, but that levels in multivitamins probably aren't high enough to cause harm.

HOW T
A MULTIVIT

This made-up multivitamin label shows how much of each vitamin and mineral we need to get every day (from foods and supplements combined), according to the National Academy of Sciences' Institute of Medicine (IOM). The IOM's Recommended Dietary Allowances (RDAs)

VITAMIN A (retinol). The Daily Value (5,000 IU) is outdated and excessive. The IOM's recommendation is now only 2,310 to 3,000 IU a day for adults, which is about what most multivitamins provide. Too much retinol (typically listed on labels as vitamin A palmitate or vitamin A acetate) may increase the risk of liver abnormalities and birth defects. (The Tolerable Upper Intake Level, the most that can be consumed daily without risk of adverse effects, is 10,000 IU of retinol.) Beta-carotene, which the body converts to vitamin A, doesn't cause liver problems or birth defects, but very high doses (33,000 to 50,000 IU a day) from pills may increase the risk of lung cancer in smokers. Our advice: don't get more than 4,000 IU of retinol or 5,000 IU of beta-carotene from your multivitamin. Instead, load up on beta-carotene-rich fruits and vegetables like carrots, cantaloupe, sweet potatoes, and broccoli, which may help prevent some cancers.

VITAMIN D. It helps you absorb calcium and may reduce the risk of cancer, diabetes, and falls. Many people get too little vitamin D from their food or from sunshine (especially in the winter). The IOM recently upped its recommendation to 600 IU a day for adults up to age 70 and 800 IU for people over 70. Those amounts include what you get from the sun, from salmon and other fatty fish, and from fortified foods like milk, breakfast cereals, and some brands of yogurt, margarine, and orange juice. They also include the vitamin D that is in many calcium supplements. Most multivitamins contain 400 IU of vitamin D (the DV).

THIAMIN (B-1), RIBOFLAVIN (B-2), NIACIN (B-3), B-6. Adding extra is cheap for manufacturers, since a whole year's worth of the DVs for these four vitamins costs about 20 cents wholesale. Higher-than-DV levels are harmless, with two exceptions: more than 100 mg a day of B-6 can cause (reversible) neurological damage, and as little as 50 mg a day of niacin can cause flushing.

VITAMIN B-12. Ten to 30 percent of older adults may be unable to absorb the B-12 in food, so the IOM recommends that people 50 and older get 2.4 micrograms a day from a supplement or a food that is fortified with B-12. Most multivitamins have at least 6 mcg (the DV), and some have much higher levels, which are perfectly safe. A B-12 deficiency can cause irreversible nerve damage and may masquerade as Alzheimer's disease.

IRON. The DV (18 mg) is fine for menstruating women and girls, who lose iron each month. However, too much iron can cause constipation or iron overload in people who are susceptible. And scientists haven't ruled out the possibility that too much iron increases the risk of heart disease or cancer (though the evidence is weak). So men and postmenopausal women should look for a multi with no more than 10 mg of iron or take a multi with18 mg of iron every other day.

MAGNESIUM. Americans get too little magnesium from their food (among the best sources: whole grains and beans). A deficiency may increase the risk of diabetes and colon cancer. For adults 31 and older, the IOM recommends 320 mg a day of magnesium for women and 420 mg for men. Taking more than 350 mg a day from a supplement (but not food) may cause diarrhea. Multivitamins typically have only 50 to 100 mg of magnesium because 300+ mg simply wouldn't fit.

SELENIUM. Many multivitamins have less than the DV (70 micrograms) or the IOM's recommended level (55 mcg). Several studies have suggested that taking 200 mcg a day increases the risk of diabetes, so it's safest to take a multi with no more than about 100 mcg.

IODINE, MANGANESE, MOLYBDENUM, CHLORIDE, BORON. Ignore. There's no evidence that people need more than what they get from their food.

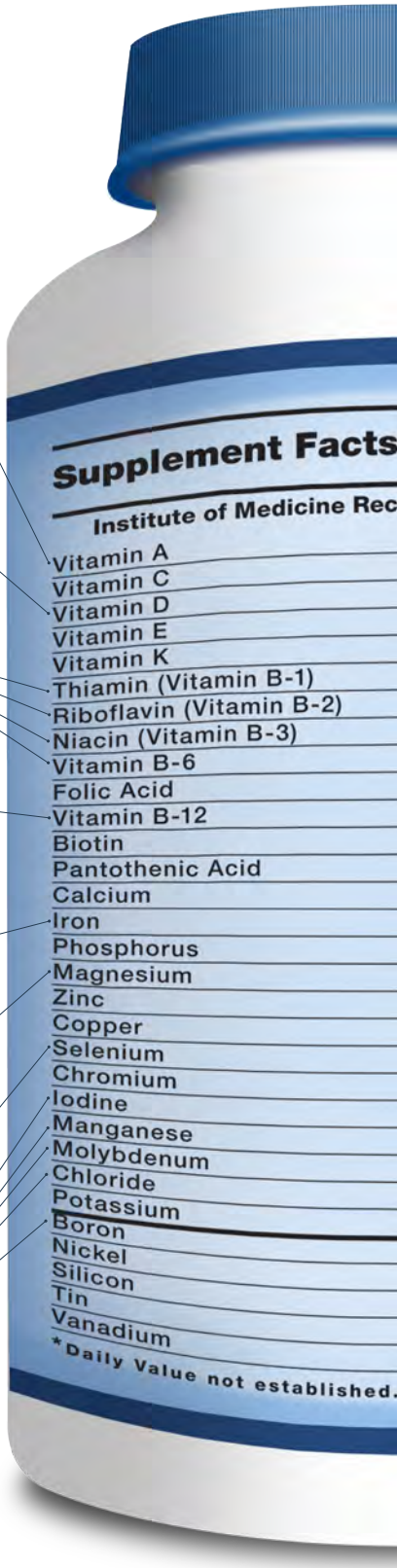
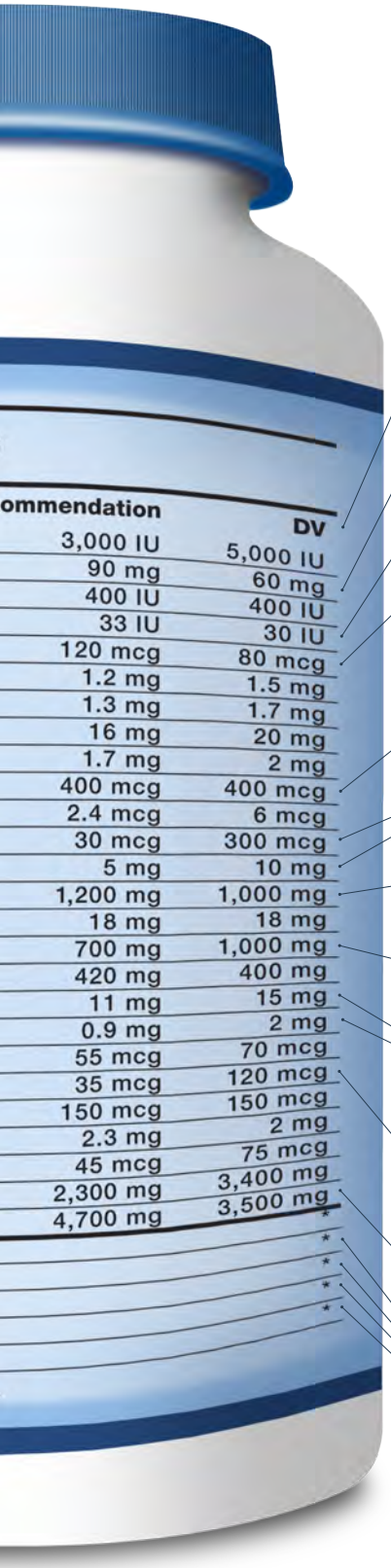


Illustration: Jorge Bach.

STORY

O READ
TAMIN LABEL

vary slightly by age and gender. In most cases, we picked the highest level for adults, excluding pregnant and breastfeeding women. Multivitamin labels list the Daily Value (DV) for each nutrient, not the IOM recommendation. The DVs haven't been updated in decades, and some are outdated.



DAILY VALUE (DV). The Daily Value for each vitamin or mineral is the Food and Drug Administration's standard for food and supplement labeling. It includes what you should get from food and supplements combined. In some cases, the DVs date from 1968 and don't reflect the latest recommendations.

VITAMIN C. The DV (60 mg) is lower than the IOM's current recommendations (75 mg a day for women and 90 mg for men). Taking more than 1,000 mg (1 gram) of vitamin C at one time in a supplement may cause diarrhea.

VITAMIN E. Doses of 30 to 800 IU a day haven't protected against heart disease or stroke, and 400 IU a day or more may slightly raise the risk of dying. What's more, taking 400 IU a day for five years may have elevated the risk of prostate cancer in a recent National Cancer Institute study. To play it safe, stick to a supplement with no more than 100 IU.

VITAMIN K. The IOM recommends 120 micrograms a day, yet most multivitamins have much less than the DV (80 mcg) because vitamin K can interfere with blood-thinning drugs like Coumadin. People on those medications should check with their doctor before taking a multi with vitamin K. In recent studies, vitamin K didn't strengthen bones, as earlier studies had suggested.

FOLIC ACID. Women who could become pregnant should look for a multivitamin with the DV for folic acid (400 mcg) to reduce the risk of neural tube birth defects. Others should make sure they don't get more than 800 to 1,000 mcg a day from a multi, other supplements, breakfast cereals, and other fortified foods combined. If you're getting 400 mcg of folic acid from your multi and 400 mcg from a breakfast cereal or B-complex supplement, one option is to take the multi every other day.

BIOTIN, PANTOTHENIC ACID. Ignore. You'd have to eat a bizarre diet to run short.

CALCIUM. Calcium may help prevent colon cancer and (with vitamin D) may reduce the risk of osteoporosis. Women should shoot for 1,000 mg a day if they're 50 or younger and 1,200 mg if they're over 50. Men need 1,000 mg a day up to age 70 and 1,200 mg after that. But more than 1,500 mg a day may raise the risk of prostate cancer. The average man gets enough calcium until age 70 and is only about 200 mg short of daily target levels after that.

PHOSPHORUS. Unnecessary to get from a multi. Too much may impair calcium absorption, and we already get more than we need from our food.

ZINC, COPPER. For zinc, look for 8 mg (women) or 11 mg (men) and for copper 0.9 mg (women and men). There's no harm in taking a multivitamin with the DVs (15 mg for zinc and 2 mg for copper), but don't regularly take supplements with more than around 30 mg of zinc. That much, combined with what people normally get from foods like meat, poultry, beans, nuts, dairy foods, and fortified cereals, is likely to put you over the Tolerable Upper Intake Level of 40 mg a day, which could make your body lose copper. And in a large government-funded study, taking 80 mg of zinc every day led to a greater risk of being hospitalized for urinary tract complications.

CHROMIUM. The IOM recommends 20 to 25 micrograms a day (women) or 30 to 35 mcg a day (men). Many brands have closer to 120 mcg (the DV), which is safe.

POTASSIUM. Ignore. The amounts in multivitamins are low. And while the potassium chloride that's used in supplements may lower blood pressure and the risk of stroke, it won't help prevent kidney stones and bone loss like the potassium citrate that's found in fruits and vegetables.

NICKEL, SILICON, TIN, VANADIUM. Ignore. It's not clear that they're needed.

Fruit, Not Juice

"Don't drink your calories" is good advice if you're trying to watch your weight, even if it's fruit juice you're drinking.

Researchers gave 34 young men and women—half were overweight or obese and half were lean—roughly 400 to 550 calories a day of either solid food (fruits and vegetables) or fruit juices. (Each participant got enough food or juice to comprise 20 percent of his or her usual calorie intake.) The solid food, which came to six to eight servings a day, was 10 percent vegetables (raw carrots, broccoli, and cauliflower), 35 percent fresh fruit, and 55 percent dried fruit.

After eight weeks on the fruits and vegetables, the people in the lean group compensated for the extra food by cutting back on their usual diets. They gained no weight. However, they gained about 3½ pounds after eight weeks on the juice.

The overweight and obese participants fared worse. They gained four pounds after eight weeks on the fruits and vegetables and five pounds after eight weeks on the juice.

What to do: Eat fruits and vegetables instead of drinking juice. And don't assume that you can't gain weight by loading up on veggies and fruit (especially dried fruit, which is calorie dense). Eat fresh fruits and vegetables *instead of*—not in addition to—higher-calorie foods.

Obesity doi:10.1038/oby.2011.192.

Sudden Death & "Low-Risk" Lifestyle

Sudden cardiac death—which occurs when the heart stops beating—accounts for half of all heart disease deaths. (The other half—myocardial infarctions—occurs when blood flow to the heart muscle gets blocked.)

Doctors can lower the risk of cardiac arrest by implanting defibrillators in patients who have irregular heartbeats. But only 25 to 30 percent of sudden deaths occur in those people. A new study suggests that a healthy lifestyle can also cut the risk.

Researchers tracked more than 81,000 women for 26 years to see who had a "low-risk lifestyle," which was defined as:

- not smoking
- being neither overweight nor obese
- getting at least 30 minutes of exercise a day
- eating a diet rich in vegetables, fruits, nuts, beans, whole grains, and fish, with a low intake of red and processed meat, considerably more monounsaturated fat (the kind in canola and olive oils) than saturated fat (the kind in red meat and high-fat dairy), and a moderate intake of alcohol.

Compared to women who had none of those low-risk factors, the risk of sudden death was 46 percent lower in women with one low-risk factor, 59 percent lower for two, 67 percent lower for three, and 92 percent lower for those with all four low-risk factors.

A healthy lifestyle could prevent 81 percent of the 250,000+ sudden cardiac deaths in the United States each year, say the authors.

What to do: Aim for as many low-risk factors as you can.

JAMA 306: 62, 2011.

D for Diabetes?

Vitamin D may protect the pancreas from diabetes in people who are at high risk for the disease because their blood sugar levels are above normal.

Researchers assigned 92 adults with prediabetes to take either vitamin D (2,000 IU a day), calcium (400 mg twice a day), both, or a placebo. Then they measured how well beta cells in the pancreas secreted insulin.

After four months, beta-cell function improved by 26 percent in the vitamin D takers and worsened by 14 percent in those who got no vitamin D. The worse your beta cells perform, the greater your odds of diabetes. Calcium had no impact on beta-cell function.

What to do: A large, long-term trial is now under way to see if vitamin D lowers the risk of diabetes. Until the results are in, shoot for 600 IU a day until age 70 and 800 IU a day after that.

Am. J. Clin. Nutr. doi:10.3945/ajcn.111.011684.

Salt Slip-Up

"New Study Finds No Connection between Salt and Heart Disease," ran the headline in *Scientific American*.

A recent review of seven studies concluded that people who were told to eat less salt had no lower risk of heart attacks or strokes. But the review was flawed, say salt experts:

- **Too few deaths.** "Our meta-analysis only had 10 percent power to detect a 10 percent reduction in [risk]," acknowledged the reviewers. That's because the number of study participants who had—or died of—heart attacks or strokes was "relatively small."
- **Heart failure study.** The review shouldn't have included a study on heart failure patients who were told to cut salt even though medications had already made them severely salt- and water-depleted.

When the salt experts looked at the remaining six studies without separating people with high blood pressure from those with normal pressure (the review looked at the groups separately), they found a 20 percent *lower* risk of heart attacks and strokes in people who ate less salt.

What to do: Cut back on salt and boost potassium-rich fruits and vegetables.

Am. J. Hyperten. doi:10.1038/ajh.2011.115 and *The Lancet 378*: 380, 2011.

SPECIAL FEATURE

Gluten-Free Confusion

Separating fact from fiction

Joseph Murray *is a gastroenterologist and professor of medicine at the Mayo Clinic in Rochester, Minnesota. He is a senior associate editor of the* American Journal of Gastroenterology *and the author of a recent study on the rising incidence of celiac disease. Murray spoke to* Nutrition Action*'s Bonnie Liebman by phone from Minnesota.*

Stomach pain, diarrhea, weight loss. Those are some of the symptoms of celiac disease, which is an autoimmune reaction to gluten, a protein found in wheat, barley, and rye.

At least one out of 100 Americans have celiac. Most of them don't know it. And studies suggest that some people who don't have the disease still can't tolerate gluten. Here's the latest on a problem that is causing much confusion.

Q: *Is the incidence of celiac rising?*

A: Yes. It has increased dramatically in the U.S. since 1950, and now affects 1 percent of the population. There's good evidence that we're not just getting better at detecting celiac. It's also increasing in other countries, even in places where it was historically common, like Finland.

And celiac disease occurs at every age. It occurs out of the blue in elderly people as well as in children.

Q: *Why is celiac increasing?*

A: There are many theories. For example, something may have changed in the way we grow, process, and eat wheat that may have affected our likelihood of getting celiac disease.

There is a drive to provide higher-gluten wheat because that's what makes bread springy and makes a good sliced loaf. And the ongoing breeding to generate new strains that are disease resistant or higher yield—that's a prime suspect.

Q: *What causes celiac disease?*

A: If you have a genetic predisposition, your T cells—T lymphocytes—start to see gluten as an enemy. Think of your body's immune system as the FBI. Once it sees gluten as an enemy, it sets up what we call a memory response.

It's like the TSA watch list for people who fly. Once you're on it, it's very hard to get off. Once you're tagged by the immune system, you're tagged forever. You can go off gluten for a year, and your intestine can heal, but once it gets gluten back, bam, here it comes again.

Q: *How does gluten become an enemy?*

A: The gluten probably gets changed by one of our human enzymes called tTG, or tissue transglutaminase, so it becomes more antigenic—that is, it looks more like a foreign invader. Then the T cells get hold of it, and they traffic it to the draining lymph nodes and set up an aggressive immune response.

Q: *And something triggers the response?*

A: Yes. Thirty percent of the population carries one of two versions of the gene for the disease—HLA DQ2 or DQ8—and essentially everybody eats gluten, yet most of us don't get celiac. So something triggers it—infection, injury to the intestine, surgery, drugs, or something else.

Q: *How does celiac harm the intestine?*

A: If you have celiac disease and you keep eating gluten, the damage accelerates and you get chronic inflammation. And the body produces cytokines, or chemical messengers, from the inflammation that make people feel crummy. They may not even point to their gut, which is where the problem is coming from. They just say, "I feel terrible."

The inflammation starts to recruit other players, and soon you've got a ruckus going on in the intestine. Eventually, it damages the lining of the intestine and your ability to absorb nutrients. (See "Celiac's Damage," p. 10.)

Q: *Is it true that most people with celiac have no GI symptoms?*

A: Probably. And most people who have celiac disease don't know it. Some don't know it because they don't have symptoms. Other people go to the doctor with anemia or other problems, but celiac disease is not suspected so they're not tested for it.

But here's the kicker. Let's say you look at people you found by doing a screening. You ask if they've got any symptoms and they say, "No Doc, I feel fine. My digestion is perfect." Then you put them on a gluten-free diet, and when you see them a year later they say, "My bowel habit is much better than it was." You say, "Huh? But I thought you said you had no symptoms."

What they'd accepted as normal, they now know wasn't. That's pretty common.

Q: *Do some people without celiac disease react to gluten?*

A: Yes. In 1980, researchers in England fed women with chronic diarrhea a gluten-free diet or not. And their symptoms went away on the gluten-free diet.

It's not quite celiac disease, but patients have the celiac genes. They may or may not have the antibodies. They may just have slight damage in the intestine. I would call that celiac *lite*.

Q: *They have a mild version of celiac?*

A: Yes. There's also a celiac-*like* condition. We call it non-celiac gluten intolerance. There's a lot of debate about it. Patients have symptoms that look like celiac disease or irritable bowel syndrome, and they get better when they go on a gluten-free diet. But they don't necessarily have the genes for celiac disease. And they don't have antibodies for celiac.

In a very good recent study, an Australian group fed these people either a gluten-free diet or not in a double-blind, placebo-controlled fashion. Those who were fed gluten got their symptoms back.

You can think of it as gluten-sensitive irritable bowel syndrome because it's like IBS, but the symptoms get better

> > > > >

Illustration: Timothy Cook/NIH Medical Arts.

when people go on a gluten-free diet.

Q: *Do some people feel better on a gluten-free diet just because they expect to?*

A: Yes, there is a strong placebo response. It could last a few months. Then they could get fed up with it.

When people talk about feeling better when they go gluten free, any of ten different things could probably explain it.

In some people, it could be that when they eat less gluten, they eat less food. Eating less is the most important advice we can give to most Americans. Or they may feel better just because they eat less junk food. If you get rid of the gluten, it's harder to eat junk.

Q: *Aren't some gluten-free foods also junk?*

A: There are plenty of gluten-free foods that are unhealthy for you. And there have been studies showing that a gluten-free diet may have less fiber and vitamins. Many gluten-free foods are not fortified, so that's also an issue.

Q: *Should everyone get tested for celiac?*

A: The jury is out on that. Celiac disease is common, it's got consequences, there's a blood test you can do that will detect it fairly easily, and there's a safe treatment—a gluten-free diet—that's not easy to follow, but it's safe.

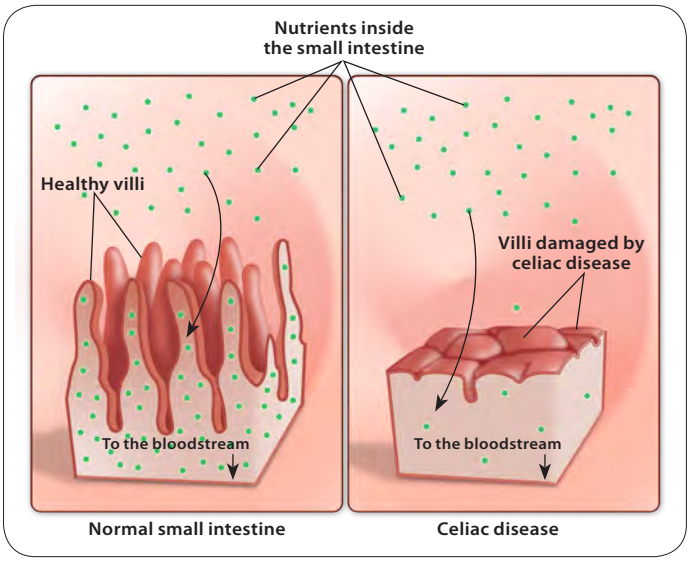
But we're not at the point of being able to prove that it's cost-effective to screen everyone. And we don't know if people, once identified, will actually go on a gluten-free diet.

Q: *So who should be tested?*

A: Anybody who has a family member with celiac disease or symptoms that are suggestive of celiac disease—like iron deficiency anemia, chronic diarrhea, bloating, gas, or abdominal pain. So should people with type 1 diabetes or autoimmune diseases like lupus or rheumatoid arthritis in the family.

Think of all the ways that celiac disease can make itself known—chronic fatigue, infertility, a skin rash called dermatitis herpetiformis, or nervous system problems like nerve damage or a loss of muscle coordination called ataxia.

Celiac's Damage



In celiac disease (right), the immune system damages the villi—the tiny, fingerlike protrusions that line the inside of the small intestine. Without healthy villi, celiac patients can't absorb enough nutrients into the bloodstream.

It can also show up as bone problems like premature osteoporosis or osteomalacia, which is a softening of the bones due to lack of vitamin D, or as severe joint problems called arthralgias.

Doctors may not think about celiac disease because these are common problems, and other explanations for them are probably more likely than celiac.

Q: *How do you test for celiac?*

A: A blood test for antibodies to tissue transglutaminase is the first step. If the tTG test is positive, the current recommendation by virtually every organization is to get a biopsy of the lining of the small intestine.

Q: *Why do you need a biopsy?*

A: If the tTG test is positive, that increases your probability of having the disease ten-fold. So if somebody has terrible diarrhea or they're anemic and has a brother with celiac, their likelihood of having the disease is one in two. If their tTG test is positive, it's virtually certain that they have the disease.

On the other hand, if a patient comes to me and says, "I've got chronic fatigue, Doc. And I've got a bit of bloating." Well, the chances that they have celiac disease if they have no family history are probably about 1 in 30. A positive tTG test increases the likelihood ten-fold, so the patient's chance of having celiac disease is one in three. That means two out of three patients with a positive test won't have the disease.

That's not a solid basis to make a diagnosis and put someone on a diet. You've got to biopsy them.

Q: *Is a biopsy definitive?*

A: Yes, as long as the patient isn't already on a gluten-free diet. If they are, the biopsy may not see signs of celiac. The same is true for the blood test. That's all the more reason that people should get tested before going on a gluten-free diet.

Q: *What if the tTG test is negative?*

A: A negative tTG test reduces their chance of having celiac ten-fold. So it goes from one in 30 to one in 300. That's pretty darn low.

Q: *What's the harm in not getting tested?*

A: If people derive some benefit from a gluten-free diet without getting tested, I would never argue with success. But there are risks.

People could have other diseases like Crohn's disease, peptic ulcer disease, or colon cancer. Those conditions could go untreated while the patient focuses on avoiding gluten. So before people go on a diet like this, they need to know what they have or don't have.

Q: *Should doctors test people who have irritable bowel syndrome for celiac disease?*

A: Yes. And if no alternative diagnosis suggests itself to me, I will say, "You could try a gluten-free diet."

Q: *Is it good that gluten-free foods are showing up everywhere?*

A: Yes, because that makes it a lot easier for people with celiac.

The danger with that trend, though, is that it may trivialize a real disease. So while we think, "Oh, everyone is on a gluten-free diet. It's no big deal," it is a really big deal for people with celiac, and it's a super big deal for people with severe complications including lymphomas, carcinoma of the small intestine, and maybe esophageal cancer.

Q: *Are those cancers going up because celiac is more common?*

A: No. How much of the risk of lymphoma is due to celiac? Tiny. Super duper tiny. How much of the risk of lung cancer is caused by smoking? Now that's a high number.

Illustration: Jorge Bach.

SPECIAL FEATURE

Gluten Free-For-All

What's the top reason that people buy gluten-free foods? It isn't because of celiac disease or gluten intolerance, according to a 2010 online nationwide survey by the market research firm Packaged Facts.[1] That was a key motivation (consumers could choose several) for only 8 to 12 percent of respondents.

Nearly half (46 percent) said that they avoided gluten because gluten-free foods were "generally healthier." Another 30 percent said they did it to manage their weight. And 22 percent thought gluten-free foods were "generally higher quality." Oops.

Some gluten-free foods *are* truly healthy: vegetables, fruits, beans, low-fat dairy, seafood, and poultry have no gluten because they contain no wheat, barley, or rye. Rice, potatoes, corn, oats, and quinoa are also gluten free... unless they're contaminated by wheat during processing.

Luckily for people with celiac disease or non-celiac gluten intolerance, the food industry now sells a growing variety of healthy gluten-free foods like whole-grain pasta, crackers, and cereals. But companies also market gluten-free versions of cakes, cookies, brownies, doughnuts, muffins, granola bars, and other junk.

While that's a plus for gluten-intolerant people who want an occasional splurge, the healthiest diets have room for a mere teaspoon of added sugars and just four or five small slices of bread or half-cup servings of (whole-grain) cereal, pasta, or other grain foods per day. Better to get your carbs from vegetables, fruits, and beans.

Can a gluten-free diet help you lose weight? It might if it meant you no longer ate cookies, pizza, bread, pasta, and other carbs. But now we can have our gluten-free cake and eat it, too. (Patients with celiac disease often *gain* weight when they go off gluten, because the healing villi in their small intestines can absorb more nutrients.)

What is Gluten Free?

In 2007, the U.S. Food and Drug Administration proposed a definition of "gluten free": a food can contain no barley, rye, or wheat (or its relatives: spelt, kamut, and triticale), and gluten can comprise no more than 20 parts per million. But the FDA never finalized the rule, so there's no guarantee that "gluten-free" claims are honest.

In the meantime, consumers have to learn the other names for wheat, like semolina, durum, graham, and enriched flour. They also have to know that the malt in most beer is made from barley, and that foods like bouillon cubes, cold cuts, hot dogs, sausage, gravy, rice mixes, soups, and soy sauce may have gluten hidden in ingredients like "vegetable protein" or "wheat starch."

Here's a sampling of gluten-free foods that may look "generally healthier" than they really are.

[1] www.foodnavigator-usa.com/Business/Celiac-disease-may-have-little-influence-on-soaring-gluten-free-market

BREAKFAST COOKIE

Most cereal bars are junk. Glutino Gluten Free Blueberry Breakfast Bars are no exception.

The "blueberry filling" has more sugar, apple powder, white grape juice concentrate, and water than blueberries. The rest is mostly chick pea flour, corn flour, and fructose (the unpopular sugar in high-fructose corn syrup).

It's like having an oversized Fig Newton for breakfast.

QUARTER POUNDER

Whole Foods deserves credit for its Gluten Free Bakehouse frozen baked goods. But honestly, does anyone need sweets like an "all natural" Vanilla Cupcake?

Each quarter-pound cupcake packs 480 calories, 13 grams of saturated fat (more than half a day's worth), and 12+ teaspoons of sugar. They're made largely from sugar, butter, eggs, evaporated cane juice (more sugar), milk, rice flour, tapioca starch, potato starch, and xanthan gum—all packaged in two layers of plastic. Is that what they mean by "whole foods"?

FOODS SHOULD BE HONEST

Sweet potato chips? Great idea. Sweets are gluten free and healthier than white potatoes.

Unfortunately, Food Should Taste Good Sweet Potato All Natural Chips have more corn and oil than sweet potato.

Another chip scam: "veggie chips" like Eat-Smart Naturals Garden Veggie Crisps, which are mostly potato flour, potato starch, oil, and tomato. They've got more salt (about a fifteenth of a teaspoon) than spinach or beet powder.

PREMIUM POWDER

"Gluten-free pretzels coated with premium yogurt," boasts the label.

First of all, Glutino's pretzels are largely made of corn starch and potato starch. And that "premium yogurt" coating is nothing but evaporated cane juice (sugar), cocoa butter, whole milk powder, and yogurt powder.

A nine-pretzel serving has 160 calories, 5 grams of saturated fat (a quarter of a day's worth), 2½ teaspoons of sugar, and virtually none of the protein, vitamins, or minerals you'd get in yogurt.

NOT SO NATURAEL

Bionaturae Organic Gluten Free Fusilli is supposed to "closely match the flavor and nutritional content of wheat pasta." White pasta, that is.

Bionaturae uses organic rice flour, rice starch, potato starch, and soy flour, but none of it is whole grain. Save your spaghetti sauce for something like Lundberg Organic Brown Rice Gluten-Free Pasta. It has less protein and fiber than whole wheat pasta, but at least it hasn't been denuded.

As for Ancient Harvest Quinoa SuperGrain Pasta, it has more corn flour than quinoa.

Photos: Jorge Bach.

PASTABILITIES

How to Find a Super Sauce

BY JAYNE HURLEY & BONNIE LIEBMAN

Quick. Cheap. Convenient. It's no surprise that pasta is one of the most popular meals in homes (and at restaurants).

That jar or tub of tomato, Alfredo, or pesto sauce is partly what makes pasta so easy. Yet picking a sauce can be anything but. Which has less salt? Less sugar? Little or no saturated fat? More flavor? Which claims on the label matter and which are just marketing blather? Here's what you need to know.

Information compiled by Zahra Hassanali and Melissa Pryputniewicz.

1. Check the serving size.

The serving on Nutrition Facts labels is typically a half cup if it's a red (tomato) sauce and a quarter cup if it's an Alfredo or pesto. But watch out.

Companies like Le Grand, Sauces 'n Love, and Scarpetta use two level tablespoons (an eighth of a cup) for their pestos, and Whole Foods uses two tablespoons for its Mama's Pesto and just one tablespoon for its 365 Basil Pesto. Seriously? One tablespoon?

Even a quarter or a half cup ain't much. Why are labels allowed to give calories, sodium, etc., for so little sauce? Because it only has to cover one cup of cooked pasta, which is the official serving. That's the size of a baseball. It's more like a side dish than an entrée. Solution: add enough veggies to bump the volume up to main-dish territory.

2. Look for less salt.

Sodium is the Achilles' heel of pasta sauces. Unless you find a no-salt-added brand that you like (we didn't), that half-cup serving can get a rise out of your blood pressure. Sauces vary widely, as you can see from these typical sodium levels in some popular brands:

■ **200-300 mg:** Amy's Organic Light in Sodium, Cucina Antica, Dell'Amore

■ **300-400 mg:** Francesco Rinaldi ToBe Healthy, Muir Glen Organic, Prego Heart Smart, Prego Veggie Smart, Rao's Homemade

■ **400-500 mg:** Classico, Colavita, Emeril's, Prego, Ragú

■ **500-600 mg:** Amy's Organic, Barilla, Bertolli, Buitoni, Francesco Rinaldi, Hunt's, Newman's Own, Ragú Robusto

See the photos on this and the next page for the best-tasting Best Bites (no more than 300 mg of sodium in every half cup), Honorable Mentions (no more than 350 mg), and near misses. Better yet, make your own pasta sauce (see p. 15 for recipes).

3. Ignore vegetable claims.

"2 servings of veggies in every ½ cup of sauce!" boast Ragú's Chunky tomato sauce labels. "More than 2 full servings of veggies," say Prego's Veggie Smart labels. "50% of your daily vegetable recommendation."

Since each quarter cup of tomato purée or sauce is a serving of vegetables, according to the Food and Drug Administration, a half cup of just about any (mostly tomato) sauce would qualify as two servings. (Veggie Smart adds some sweet potato and carrot juice concentrates, which ups the vitamin A and boosts the vegetables above two servings.)

But you'd be better off not relying on a half cup of pasta sauce to supply two of the six daily servings of veggies (plus five servings of fruit) that the healthiest diets have. Not when you could feast on a broccoli-mushroom stir-fry or a spinach-artichoke-heart salad or a grilled vegetable kabob instead.

And don't bank on the lycopene in tomato sauce to lower prostate cancer risk. Recent studies have found no lower risk of prostate cancer—especially the aggressive type—in men who have higher blood levels of lycopene.

4. Ignore "no sugar added" claims.

"No sugar added" is showing up on a growing list of sauce labels, from Bobby D's, Cucina Antica, and Mario Batali to Patsy's, Prego Veggie Smart, and Ragú Light. The less added sugar, the better. But a serving of most red sauces has only about 4 grams (one

Prego Heart Smart Ricotta Parmesan. Built-in cheese. Just missed an Honorable Mention.

Francesco Rinaldi ToBe Healthy Garlic & Onion. Thick and herby.

Dell'Amore Original Recipe. Complex. Seductive. Not your average tomato sauce.

Classico Spicy Red Pepper. Not too spicy, with a pleasant sweet/tart balance.

Photos: © Günter Menzl/fotolia.com (pasta), Jorge Bach (all others).

Rao's Homemade Arrabbiata. Fabulously spicy. Perfectly balanced.

Colavita Garden Style. Bright, fresh flavor with plenty of veggies.

Dell'Amore Artichoke & Capers. A subtle, satisfying, delicious sauce.

Mario Batali Tomato Basil. Quality tomatoes and fresh basil make for a winner.

teaspoon) of added sugar, plus another 3 or 4 grams of sugar that occurs naturally in the tomatoes. If you have to choose between "no sugar added" and a lower-salt pasta sauce, go with less salt.

5. Don't be swayed by "healthy" or "heart" claims. "Fortified with DHA Omega 3," says the front of the Francesco Rinaldi ToBe Healthy label. Does that matter?

DHA is one of the two oils that give fish its healthy reputation (the other is EPA). If you don't eat seafood and don't want to take a DHA supplement, it's worth considering. But don't kid yourself. It would take just 1½ teaspoons of salmon to give you the 64 milligrams of DHA that are in a half cup of ToBe Healthy.

Prego Heart Smart also sounds special. It's low in fat, saturated fat, and cholesterol, and it has "more than a full serving of vegetables." But so do most other tomato-based pasta sauces.

Heart Smart's best feature is its sodium (360 mg). You can find lower levels in fabulous premium sauces like Dell'Amore and Cucina Antica. But they'll cost you two to three times as much.

6. Watch the saturated fat. It doesn't matter if a pasta sauce has cheese or sausage or if it's bolognese (meat-based). As long as it's red—and isn't a (creamy) vodka or rosa sauce—you shouldn't have to worry about saturated fat.

Vodka, rosa, and Alfredo sauces, on the other hand, can have enough cream, cheese, and/or butter to do some damage. A half cup of vodka sauce, for example, ranges from a harmless 1½ grams of sat fat to 11 grams (half a day's worth). Most fall between two and six grams. (Those at the lower end don't contain much cream.) Unfortunately, Colavita Vodka, the only one to earn an Honorable Mention, didn't win any taste awards.

The saturated fat numbers on Alfredo labels look similar to the numbers on vodka labels: three to six grams per serving. But a serving of Alfredo sauce is a quarter cup, while a serving of vodka sauce is a half cup. So if you eat a half cup of Buitoni's Alfredo, for example, you'll end up with 14 grams of sat fat and 280 calories. Pour it on a cup of pasta (200 calories), and it's like eating a Quarter Pounder with Cheese. A half cup of Whole Foods refrigerated Alfredo sauce dumps 26 grams of sat fat—more than a day's worth—into your lap.

7. Go easy on the pesto. A traditional pesto—made with basil, extra-virgin olive oil, pine nuts, Parmesan cheese, and garlic—packs 200 to 400 calories, 400 to 800 milligrams of sodium, and three to six grams of saturated fat in *every quarter cup*. While pesto's fat largely comes from heart healthy oils and nuts (exception: cream supplies most of the three grams of sat fat in Sauces 'n Love Pink Pesto), there's little you—or your hips or blood pressure—can do about the calories and sodium. Tip: stretch your pesto by thinning it with a couple of tablespoons of the pasta cooking water. You'll use less...*and* it will coat the pasta better.

8. Don't fall for extra-virgin olive oil claims. "Made with extra virgin olive oil," say the labels on many Newman's Own pasta sauces. First of all, there's very little oil in jarred tomato sauce, so the kind of oil probably doesn't matter. Second, some of the Newman's Owns that make the claim—the Five Cheese, Marinara, Mushroom Marinara, and Roasted Garlic & Peppers, for example—have more soybean oil than olive oil. (In fact, they have more salt than olive oil.)

In contrast, Bertolli and Eden Organic use only olive oil. So do Amy's Organic, DeLallo, Dell'Amore, Gia Russa, Lucini, Mario Batali, Muir Glen Organic, Sauces 'n Love, Scarpetta, and Victoria. And none of their labels brag about it.

9. Pour your sauce over whole-grain pasta. A cup of white pasta is a decent source of protein (7 grams) and fiber (2½ grams). But whole wheat pasta beats white hands down. While it has no more protein, it delivers more fiber (6 grams per cup), magnesium, vitamin E, and zinc...and has a more interesting taste. And brands like Bionaturae Organic and Whole Foods 365 have found a way to make 100 percent whole wheat pasta that isn't gritty or gummy.

If you can't find those brands, look for Barilla Whole Grain, which is 51 percent whole wheat, or (grittier-tasting) Ronzoni Healthy Harvest Whole Grain, which is 54 percent whole wheat. (Kudos to Barilla for putting the percentage right on the front of the box. We had to call Ronzoni to find out.) Barilla wouldn't tell us what percentage of the grain in its Barilla Plus is whole. But it contains more semolina (refined wheat) than anything else.

If you're on a gluten-free diet, try one of Lundberg's Brown Rice Pastas.

10. Follow your taste buds, but don't forget your pocketbook. The two knockout pasta sauces—Rao's and Dell'Amore—are expensive ($7 to $10 a bottle) for a reason. They use the highest-quality ingredients, and they're simmered for far longer than most other sauces. But don't ignore the other brands pictured on pages 12 and 13. They're all worth a taste. You may find one you love...*and* save a bundle.

Photos: Jorge Bach.

On Top of Spaghetti...

BRAND-NAME RATING

Best Bites (✔✔) have no more than 300 milligrams of sodium, 200 calories, and (for tomato and creamy sauces) 1 gram of saturated fat in a serving. **Honorable Mentions** (✔) can have up to 350 mg of sodium (and 2 grams of sat fat for tomato and creamy sauces). Tomato sauces and pestos are ranked from least to most sodium, then sat fat, then calories. Creamy sauces (Alfredos, vodkas, and rosas) are ranked from least to most sat fat, then sodium, then calories.

TOMATO (½ cup)	Calories	Saturated Fat (g)	Sodium (mg)
✔✔ Eden Organic No Salt Added	70	0	10
✔✔ Trader Giotto's Organic No Salt Added Marinara	50	0	30
✔✔ Francesco Rinaldi No Salt Added	70	0	40
✔✔ Mario Batali Tomato Basil	70	0.5	180
✔✔ Dell'Amore[1]	80	0.5	240
✔✔ Cucina Antica[1]	40	1	240
✔✔ Rao's Homemade—Puttanesca or Sensitive Formula[1]	80	1	270
✔✔ Whole Foods Plum Tomato Basil[R]	60	0	280
✔✔ Paesana Organic Tuscan Pepper	70	0	280
✔✔ Good Food Marinara	110	0	280
✔✔ Sauces 'n Love or Scarpetta—Arrabbiata, Barely Bolognese, or Marinara[1R]	50	0.5	280
✔✔ Colavita—Garden Style or Mushroom[1]	60	0	290
✔✔ Francesco Rinaldi ToBe Healthy Garden Vegetable	60	0	290
✔✔ Bobby D's Ma's Green Thumb	70	0	290
✔✔ Amy's Organic Light in Sodium[1]	90	0.5	290
✔✔ Paesana—Fra Diavolo or Sicilian Gravy[1]	90	0.5	290
✔✔ Eden Organic Spaghetti	70	0	300
✔✔ La Famiglia DelGrosso—Arrabbiata Memories or Tomato Basil Masterpiece[1]	70	0.5	300
✔✔ Seeds of Change Arrabiatta di Roma	80	0.5	300
✔✔ Classico Spicy Red Pepper	60	1	300
✔ Francesco Rinaldi ToBe Healthy, except Garden Vegetable[1]	60	0	320
✔ Colavita—Marinara or Spicy Marinara[1]	70	0	320
✔ Sauces 'n Love or Scarpetta Puttanesca[1R]	50	0.5	320
✔ Patsy's Puttanesca	100	1	320
✔ Ragú Light[1]	60	0	330
✔ Classico—Cabernet Marinara or Roasted Garlic[1]	70	0	340
✔ Mario Batali Cherry Tomato	60	0.5	340
✔ Rao's Homemade—Arrabbiata, Cuore DiPomodoro, Marinara, Roasted Eggplant, or Tomato Basil[1]	70	0.5	340
✔ Trader Giotto's Spaghetti	50	0	350
✔ Muir Glen Organic—Chunky Tomato & Herb, Garden Vegetable, Italian Herb, or Portabello Mushroom[1]	60	0	350
✔ Seeds of Change Tomato Basil Genovese	60	0	350
✔ La Famiglia DelGrosso—Roasted Red Pepper Tour or Fireworks Sauce[1]	80	1	350
Prego—Heart Smart or Veggie Smart[1]	80	0	370
Muir Glen Organic—Cabernet Marinara, Fire Roasted Tomato, Four Cheese, Garlic Roasted Garlic, or Tomato Basil[1]	70	0	380
Paesana—Garden Vegetable, Marinara, Puttanesca, or Roasted Garlic[1]	80	0	420
Patsy's, except Puttanesca[1]	100	1	420
Good Food, except Marinara[1]	80	0	430
Classico—except Cabernet Marinara, Roasted Garlic, or Spicy Red Pepper[1]	70	0.5	430
Mom's—regular or Organic[1]	70	0.5	430
Colavita—Fat Free or Organic[1]	80	0.5	440
Bertolli Vineyard or Emeril's[1]	80	0	450
Ragú—Chunky, Old World Style, or Organic[1]	80	0	460
Prego—regular or Chunky Garden[1]	80	0.5	470
DeLallo[1]	90	0.5	470
Organicville[1]	50	1	470
Victoria—regular or Organic[1]	80	1	480
Whole Foods 365—regular or Organic[1]	50	0.5	490
Gia Russa[1]	90	1	490
Barilla[1]	80	0	510
Bertolli—regular or Organic[1]	80	0.5	510
Francesco Rinaldi—Chunky Garden, Hearty, or Traditional[1]	80	0.5	530
Newman's Own—regular or Organic[1]	70	0.5	540
Trader Giotto's Tomato Basil Marinara	80	0.5	540
Hunt's[1]	50	0	590
Buitoni[R] or Ragú Robusto![1]	90	0.5	590
Amy's Organic[1]	100	1	590

VODKA (½ cup)			
Newman's Own	110	1.5	440
Good Food Tomato	120	1.5	450
✔ Colavita	70	2	320
Classico	100	2	420
Cucina Antica	50	2.5	220
Francesco Rinaldi	100	3	580
Bertolli Four Cheese Rosa	110	3.5	310
Mom's Martini	120	4	250
Buitoni[R]	90	4	550
Bertolli	150	4.5	700
Sauces 'n Love or Scarpetta Tuscan[1R]	120	6	240
Whole Foods[R]	230	11	280

ALFREDO (¼ cup)			
Ragú Cheesy Light Parmesan	60	3	320
Classico Light Creamy	60	3	330
Buitoni Light[R]	90	3.5	350
Classico, except Light Creamy[1]	80	3.5	380
Ragú Cheesy, except Light Parmesan[1]	110	3.5	390
Francesco Rinaldi[1]	70	3.5	400
Bertolli[1]	100	4	370
Newman's Own[1]	90	4.5	410
Buitoni[R]	140	7	350
Whole Foods[R]	200	13	330

PESTO (¼ cup)			
Trader Giotto's Genova[R]	260	3	140
Sauces 'n Love Pink[2R]	110	3	160
Whole Foods Mama's[R]	200	3	380
Sauces 'n Love—regular or Sundried Tomato[1R]	360	6	380
Le Grand Garden[R]	220	2	430
Buitoni with Basil[R]	270	3.5	450
Buitoni Reduced Fat with Basil[R]	230	3	500
Classico Traditional Basil	240	4	560
Whole Foods 365 Basil Pesto	320	6	580
Classico Sun-Dried Tomato	90	1	630
Trader Giotto's Pesto alla Genovese	250	4	840
Le Grand Sun-Dried Tomato Pesto[R]	300	7	910

✔✔ Best Bite. ✔ Honorable Mention. [R] Refrigerated. [1] Average. [2] The sat fat comes mostly from cream. *Note: Best Bites and Honorable Mentions refer to calories, sodium, and saturated fat, not taste.*

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

Photo: Jorge Bach.

Getting Sauced

BY KATE SHERWOOD

There's nothing easier than opening a jar of pasta sauce. But there's nothing more satisfying than making your own healthier version. Here are Exhibits A, B, C, and D. Each serving will nicely cover 1 cup of cooked pasta.

Got a question or suggestion? Write to Kate at healthycook@cspinet.org.

Parmesan Cream

If the sauce separates, process with a hand blender or in a regular blender.

- **2 cloves garlic, chopped**
- **2 Tbs. extra-virgin olive oil**
- **½ lb. zucchini, diced**
- **1½ cups fat-free half-and-half**
- **1 cup grated Parmesan cheese**
- **½ tsp. kosher salt**
- **Freshly ground black pepper**
- **½ tsp. lemon zest**
- **1 Tbs. lemon juice, more to taste**

In a large sauce pan, gently sauté the garlic in the olive oil for 1 minute. Add the zucchini and sauté until tender, about 3 minutes. Stir in the half-and-half and bring to a simmer. Remove the pan from the heat and stir in the Parmesan. Season with up to ½ tsp. of the salt plus the pepper, lemon zest, and lemon juice. Yield: 2½ cups.

PER SERVING (¼ cup)

Calories: 90	*Sodium: 270 mg*
Total Fat: 6 g	*Cholesterol: 10 mg*
Sat Fat: 2 g	*Carbohydrates: 5 g*
Protein: 5 g	*Fiber: 0 g*

Spinach Pesto

Try this variation on traditional pesto over half pasta, half steamed asparagus, broccoli, green beans, peas, or any other green vegetable you like.

- **¼ cup roasted cashews**
- **1 clove garlic**
- **⅓ cup grated Parmesan cheese**
- **4 cups baby spinach**
- **¼ cup extra-virgin olive oil**
- **½ tsp. kosher salt**
- **Freshly ground black pepper**
- **¼ cup boiling water**

Combine the nuts, garlic, and Parmesan in a food processor. Pulse a few times to mince. Add the spinach and oil. Pulse until the spinach is coarsely chopped. Season with up to ½ tsp. of the salt and plenty of pepper. Stir in ¼ cup of boiling water. Yield: 1¼ cups.

PER SERVING (¼ cup)

Calories: 170	*Sodium: 300 mg*
Total Fat: 16 g	*Cholesterol: 5 mg*
Sat Fat: 3 g	*Carbohydrates: 4 g*
Protein: 4 g	*Fiber: 1 g*

No-Cook Tomato

Don't feel like pasta? Just toss this simple sauce with 2 cans (3 cups) of cannellini or other white beans. Mmmm.

- **2 lbs. ripe fresh tomatoes, diced**
- **½ cup oil-packed sundried tomatoes, drained and diced**
- **3 Tbs. extra-virgin olive oil**
- **1 clove garlic**
- **⅓ cup Parmesan cheese**
- **3 cups basil leaves**
- **1 tsp. kosher salt**
- **Freshly ground black pepper**

Toss the fresh and sundried tomatoes together in a large bowl. Combine the oil, garlic, Parmesan, and basil in a food processor and pulse until well minced. Stir into the tomatoes. Season with up to 1 tsp. of the salt and plenty of black pepper. Allow to stand at room temperature while your pasta cooks. Yield: 5 cups.

PER SERVING (½ cup)

Calories: 80	*Sodium: 250 mg*
Total Fat: 7 g	*Cholesterol: 0 mg*
Sat Fat: 1 g	*Carbohydrates: 5 g*
Protein: 1 g	*Fiber: 1 g*

Spinach Pesto

No-Cook Tomato Sauce

Roasted Cherry Tomatoes & Chickpeas

My favorite way to use this sauce is to double the chickpeas and eat it without pasta.

- **3 pints cherry tomatoes, halved**
- **1 15 oz. can no-salt-added chickpeas, drained**
- **12 cloves garlic, halved lengthwise**
- **¼ cup extra-virgin olive oil**
- **¼ tsp. red pepper flakes**
- **¼ tsp. oregano**
- **Freshly ground black pepper**
- **1 tsp. kosher salt**

Preheat the oven to 425°F. Toss the tomatoes, chickpeas, and garlic with the oil and remaining ingredients except the salt. Spread on a large, rimmed baking sheet. Roast for 30 minutes. Season with up to 1 tsp. of the salt. Yield: 4 cups.

PER SERVING (½ cup)

Calories: 140	*Sodium: 260 mg*
Total Fat: 8 g	*Cholesterol: 0 mg*
Sat Fat: 1 g	*Carbohydrates: 15 g*
Protein: 4 g	*Fiber: 4 g*

Tomato Tip

If you refrigerate whole tomatoes, they'll become mealy. Store them on the counter instead.

Photos: Jorge Bach.

About CSPI, publisher of Nutrition Action Healthletter

CENTER FOR Science IN THE Public Interest

The Center for Science in the Public Interest (CSPI), founded in 1971, is an independent nonprofit consumer health group. CSPI advocates honest food labeling and advertising and safer and more nutritious foods. CSPI's work is supported by *Nutrition Action Healthletter* subscribers and foundation grants. CSPI accepts no government or industry funding. *Nutrition Action Healthletter*, first published in 1974, accepts no advertising.

For information about CSPI's national Food Day, October 24, go to www.FoodDay.org

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RIGHT STUFF

SWEET SUCCESS

Sweet potatoes are nutritional powerhouses, especially compared to their most-popular-vegetable-in-America-largely-because-they're-usually-deep-fried white-potato cousins.

But sweets take at least an hour to bake. And some days, that's an hour more than you have. (There's always 10 minutes in the microwave, if you like them cooked that way.)

That's why you should check out **Alexia Sauté Sweets**. The bag contains a mix of sweet potatoes, black beans, sweet corn, red bell peppers, and onions. And it takes just 12 minutes from freezer to "Mmmm...delish."

If you manage to stick to the one-cup serving that's listed on the Nutrition Facts panel (and that won't be easy), your side dish delivers 7 grams of fiber, 5 grams of protein, 100 percent of a day's vitamin A, 20 percent of a day's vitamin C, and 10 percent of a day's iron. All for 240 calories, 1½ grams of saturated fat, and 310 milligrams of sodium.

Best of all, you could probably prepare Sauté Sweets blindfolded. Just thaw the pouch of chipotle-infused olive oil in a bowl of hot water, pour the oil into a skillet, add the veggies, and sauté for 10 to 12 minutes, until the spuds are golden brown.

Serve it as a side dish or add some broiled salmon or chicken or sautéed tofu to make it a main.

Sauté Sweets put plain white potatoes to shame.

Alexia: (866) 484-8676

Photos: Alexia (left), Cold Stone Creamery (right).

dish OF THE MONTH

End of Summer Succotash

Sauté 1 cup each of fresh corn kernels, baby lima beans, diced zucchini, and diced red pepper in 1 Tbs. of canola oil until sizzling hot. Stir in 2 sliced scallions and 1 chopped tomato. Season with up to ⅛ tsp. of salt.

FOOD PORN

CRAVE DIGGER

"At Cold Stone, we're all about making people happy—for the long haul!—which requires a balanced and sensible approach to eating fun treats like ice cream," explains the **Cold Stone Creamery** Web site.

"We therefore obsess, far more than most companies, about the nutritional aspects of our products as much as we do their taste."

Hmmm. You have to wonder how much obsessing Cold Stone did over the nutritional aspects of its **Churro Caramel Crave**.

A churro is deep-fried dough. (The fluted or twisted sticks are sometimes called "Spanish doughnuts.") Cold Stone is apparently so worried about nutrition that it rolls its churros in cinnamon and sugar before they're "smothered with French vanilla ice cream and topped with hot caramel and whipped topping."

If 700 calories and 22 grams of saturated fat (a full day's worth) isn't a "balanced and sensible approach to eating fun treats," what is? The Churro Caramel Crave's day's worth of sodium (1,610 mg), perhaps?

Cold Stone also offers a **Brownie a La Cold Stone**, a **Chocolate Lava Meltdown**, and a **No Fair Funnel Cake**—all similarly balanced and sensible. True, they have fewer calories than most of the chain's **Signature Creations**—ice cream, candy, fudge, and other "mix-ins" in a waffle bowl. (A cone is *so* 20th century.)

But isn't that what you'd expect from ice cream purveyors who are so obsessed about nutrition and health?

Cold Stone Creamery: (866) 452-4252