

Whole Grains

The Inside Story



The average American eats less than one serving of whole grains a day. Yet it would be hard to find an American who doesn't know that people need to eat more of them.

But do Mr. and Ms. Average know why? Odds are, the reasons would surprise them.

Heart Disease

Why eat more whole grains?

"The strongest evidence is for cardiovascular disease," says Eric Rimm, an associate professor of epidemiology and nutrition at the Harvard University School of Public Health. For example:

■ In the Iowa Women's Health Study of 34,000 women, those who reported eating at least one serving of whole grains a day had a 30 to 36 percent lower risk of heart disease than those who reported eating no whole grains.¹

■ In the Nurses' Health Study of 75,000 women, those who said they ate roughly three servings of whole grains a day had a 25 percent lower risk of heart disease and a 36 percent lower risk of stroke than those who said they ate no whole grains.^{2,3}

■ In the Health Professionals Follow-Up Study of 44,000 men, those who reported eating at least 42 grams of whole grains a day—about three servings—had an 18 percent lower risk of heart attack than those who reported eating less than 4 grams a day.⁴

■ Among more than 200 women with heart disease in the Estrogen Replacement and Atherosclerosis Trial, those who ate more than six servings of whole grains a week had less artery clogging over the next three years than those who ate whole grains less often.⁵

Sounds like an open-and-shut case. But researchers aren't convinced that it was only whole grains that made the difference. "People who eat whole grains tend to

do a lot of other healthy things, like exercising and not smoking," explains Joanne Slavin, a professor of food science and nutrition at the University of Minnesota in St. Paul.

They also get less saturated fat and more vitamins. "We try to account for those things, but they still might confound our results," Slavin explains, because health-conscious people may do other things that scientists don't know about.

To try to nail down cause-and-effect, researchers look for a mechanism that would explain *how* whole grains might protect the heart. Among the possibilities:

■ **Cholesterol.** Whole grains that are rich in water-soluble fiber—like oats and barley—lower LDL ("bad") cholesterol. "There's no question that if you feed people soluble fiber in large enough doses, you can lower their cholesterol," says Slavin.

But most Americans—including all those nurses, health professionals, and Iowa women with a lower risk of heart disease—eat far less barley and oats than whole wheat, which is high in *insoluble* fiber. And wheat bran, one of the richest sources of insoluble fiber, doesn't lower cholesterol. Yet men who eat the most bran have the lowest risk of heart disease.^{4,6}

"If you look at the fiber data, it's clear that grains rich in insoluble fiber are also protective," says Slavin. "So you've got to look beyond cholesterol for an explanation."

■ **Insulin.** In a small study, researchers fed 11 overweight adults with high insulin levels 6 to 10 servings a day of either

whole or refined grains. Fasting insulin levels were lower after six weeks on the whole grains than after six weeks on the refined grains.⁷

"Whole grains seem to improve insulin metabolism," says David Jacobs, a professor of epidemiology at the University of Minnesota who co-authored the study.

High insulin levels can raise the risk of both heart disease and diabetes. And a new study found a lower risk of the metabolic syndrome—which is linked to high insulin levels—in older people who eat whole grains.⁸

Nevertheless, says Slavin, "I wish we had bigger studies to prove that whole grains have an impact on insulin sensitivity."

■ **Antioxidants, etc.** Whole grains are rich in antioxidants that may protect against tissue damage by scavenging marauding free radicals.

But "the antioxidant story has big holes," acknowledges Slavin. High doses of vitamin E, for example, don't prevent heart attacks. "It's possible that when you isolate antioxidants and take them in high doses, they don't work," she says.

Whole grains are also rich in a slew of other possibly protective substances, including plant sterols, lignans, phytates, vitamins, and minerals.

"Magnesium is probably the number-one mineral in whole grains that we need," says Slavin. "Potassium is another. Both are needed but aren't typically added to fortified foods." (See "White vs. Whole Wheat," p. 5.)

Which, if any, of those constituents may make whole grains heart-friendly is

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still an open question. “We need more research to pin down the mechanisms,” says Slavin.

Diabetes

Do whole grains prevent diabetes?

In the Iowa Women’s Health Study, the Nurses’ Health Study, and the Health Professionals Follow-Up Study, people who consumed at least three servings a day of whole grains had a 20 to 30 percent lower risk of diabetes over the next decade or so than people who ate roughly one serving a week.^{2,9,10}

But it’s the heart disease story all over again. Researchers worry that something else about whole-grain eaters protects them.

“We try to eliminate those confounders, but it’s always possible that some are left over,” says Jacobs, “because people who eat whole grains have healthier behavior overall.”

But he and others are encouraged by evidence for mechanisms that could explain why whole grains may prevent diabetes. Lower insulin levels is one possibility (see p. 3). Among the others:

■ **Fiber.** The soluble fiber in whole grains like oats and barley can keep carbohy-

drates from entering the bloodstream too quickly.¹¹

“Theoretically, if the absorption of carbohydrates were slowed, you’d have less stress on the pancreas, and insulin levels wouldn’t shoot up,” says Alice Lichtenstein of the U.S. Department of Agriculture Jean Mayer Human Nutrition Research Center on Aging at Tufts University in Boston.

But most whole grains (and wheat bran) are rich in *insoluble* fiber, which doesn’t slow absorption. “The quantities of soluble fiber we consume would have only a small effect on insulin,” Lichtenstein cautions.

■ **Glycemic index.** Many people assume that whole grains raise blood sugar levels less than refined grains (in other words, that whole grains have a lower glycemic index). However, what matters isn’t whether the grain is whole or refined, but whether it’s finely ground (like flour) or intact (like bulgur or brown rice).

“Whole-grain flour has nearly the same glycemic index as refined flour,” says Jacobs. “Intact whole grains have a low glycemic index.”

The bottom line: “This is a very preliminary area of whole-grain research,” says Slavin.

Bowel Function

“Whole grains may have their biggest impact in the bowel,” where fiber helps keep things moving, says Slavin.

For example, Australian researchers gave 28 overweight middle-aged men enough whole-grain wheat or rye (about eight ounces of bread, cereal, and crackers) to bring their fiber to 32 grams a day. (That’s about what experts now recommend, and about twice as much as the average American man consumes.) Stool weights were higher than when the men ate low-fiber versions of the same foods (only 19 grams of fiber a day).¹²

“Insoluble fiber is beneficial for bowel function, which is a huge problem in the U.S.,” says Lichtenstein.

Obesity

“When people eat whole grains, they feel full sooner, so they eat fewer calories,” says Slavin. “But could eating more whole grains help people lose weight? It’s never been tested.”

Women and men who consume more whole grains gain less weight over a decade or so than those who consume more refined grains.^{13,14} But the difference is only a pound or two.

And, once again, it’s not clear if whole grains cause less weight gain or if health-conscious people who eat whole grains also watch their weight.

“It’s difficult to study obesity because so many things contribute to it,” says Harvard’s Eric Rimm. “But there’s a growing body of evidence to suggest that whole grains are important, maybe just because they make people get full faster.”

Colon Cancer

If there’s one benefit people expect from whole grains, it’s a lower risk of colon cancer. But the evidence is shaky.

Some studies found a lower risk of colon cancer in people who ate more fiber from whole grains, fruits, and vegetables, but other studies didn’t. Then two clinical trials on people who had had precancerous colon polyps came up empty.

Researchers found no fewer new polyps in those who were told to eat more wheat bran or more fiber-rich grains, fruits, and

WHAT IS A WHOLE GRAIN?

BRAN

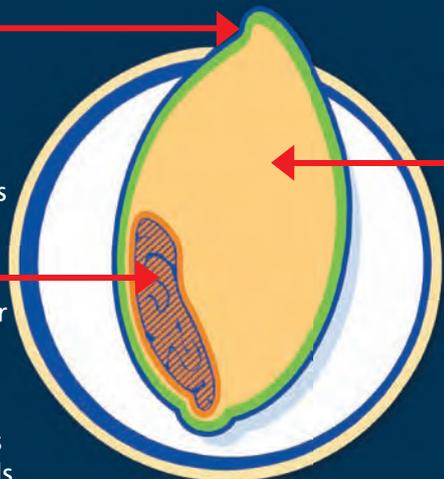
“Outer shell” protects seed

- Fiber
- B Vitamins
- Trace Minerals

GERM

Nourishment for the seed

- B Vitamins
- Vitamin E
- Trace Minerals
- Phytochemicals



ENDOSPERM

Provides energy

- Carbohydrate
- Protein
- Some B Vitamins

White vs. Whole Wheat

vegetables for three or four years than in those who ate their usual diets.^{15,16}

“It is clear that the high-fiber diet did not keep polyps from recurring, but what that means about fiber and colon cancer is less clear,” says the University of Minnesota’s David Jacobs.

The Bottom Line

Science aside, some experts are nervous that the food industry may oversell foods with just a smidgen of whole grains (see “The Whole Truth,” p. 6).

“We get too little exercise and eat too much high-calorie food,” says the University of Minnesota’s Joanne Slavin. “Our diet is broken, and you can’t fix it by adding a few grams of whole grains or fiber.”

What’s more, it’s risky to urge Americans to eat more food, especially snack foods, even if they are whole grain.

“When I see 100% Whole Grain Chips Ahoy, I get worried,” says Tufts University’s Alice Lichtenstein. “We want to encourage a shift to whole-grain products, but I don’t want to give people the impression that they should eat more cookies.”

“In a country where two out of three adults are overweight or obese, we eat too much of everything already,” she adds. “Do most of us have the discretionary calories to fit a cheese Danish made with whole grains into our diets?”

Despite the uncertainties, most researchers are convinced that replacing refined grains with whole grains is wise.

“Without long-term, randomized clinical trials of whole grains and disease, I don’t have proof that the benefits of whole grains are real,” says Jacobs.

“But I am 100 percent in favor of encouraging people to eat whole grains. I go back to the theory that phytochemicals as bundled in plant foods are good until proven otherwise.”

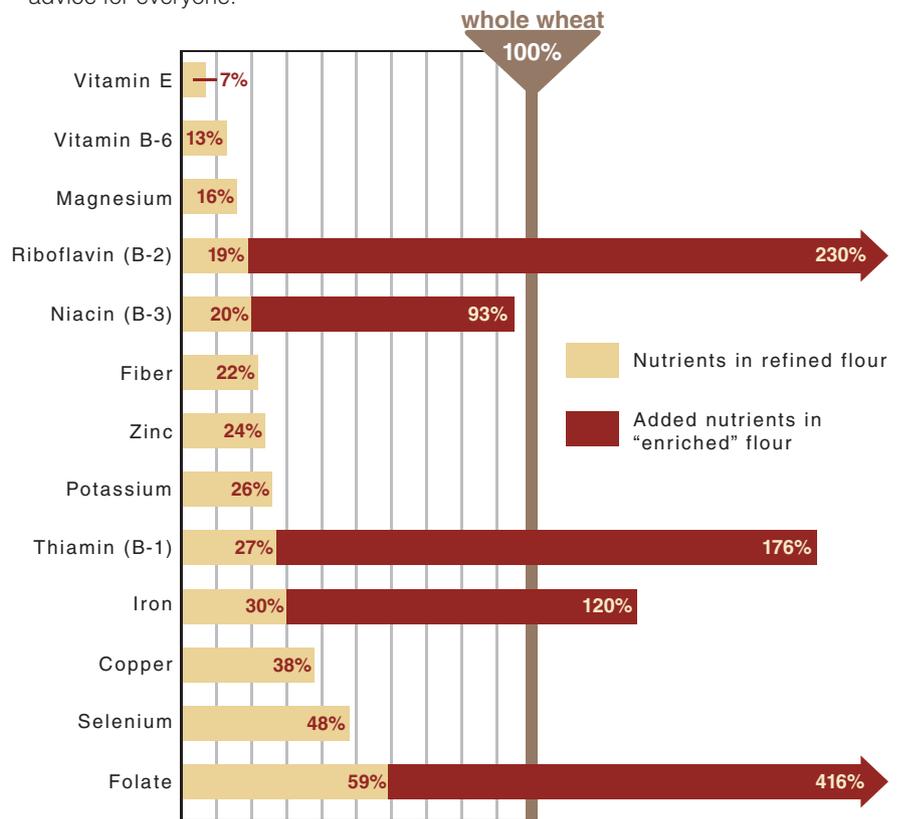
And, experts note, there’s no evidence that *refined* grains lower the risk of disease or obesity.

“Encouraging people to buy bread where the first ingredient is whole wheat clearly will do no harm,” says Rimm. “And there’s pretty strong evidence that it will be beneficial for heart disease and diabetes.” 🍞

What do you lose when whole wheat is refined? Plenty. The gold bars show how little of 13 key nutrients remains. For example, refined flour has just 7 percent of the vitamin E, 13 percent of the vitamin B-6, and 16 percent of the magnesium of whole wheat flour.

The red bars show the five nutrients that are added back to refined flour to make it “enriched.” Whole wheat is clearly more nutritious than enriched flour, with one exception: enriched flour not only has more folate, but the added folate (folic acid) is absorbed better than the folate that occurs naturally in whole wheat flour. (The higher-than-whole-wheat levels of B-1, B-2, and iron in enriched flour aren’t reason enough to pick enriched over whole wheat.)

Some experts recommend that women who could become pregnant eat a mix of enriched and whole grains to get enough folate to reduce the risk of neural tube birth defects. A smarter strategy: take a multivitamin to make sure you get enough folate, and eat whole grains to get fiber plus a raft of vitamins, minerals, and who-knows-how-many phytochemicals that may protect your health. That’s not bad advice for everyone.



Graphic adapted from Oldways Preservation Trust and the Whole Grains Council (wholegrainscouncil.org).

¹ *Amer. J. Clin. Nutr.* 68: 248, 1998.
² *Amer. J. Clin. Nutr.* 70: 412, 1999.
³ *J. Amer. Med. Assoc.* 284: 1534, 2000.
⁴ *Amer. J. Clin. Nutr.* 80: 1492, 2004.
⁵ *Amer. Heart J.* 150: 94, 2005.
⁶ *Diabetes Care* 25: 1522, 2002.
⁷ *Amer. J. Clin. Nutr.* 75: 848, 2002.
⁸ *Amer. J. Clin. Nutr.* 83: 124, 2006.

⁹ *Amer. J. Clin. Nutr.* 71: 921, 2000.
¹⁰ *Amer. J. Clin. Nutr.* 76: 535, 2002.
¹¹ *Amer. J. Clin. Nutr.* 61: 379, 1995.
¹² *Amer. J. Clin. Nutr.* 77: 967, 2003.
¹³ *Amer. J. Clin. Nutr.* 78: 920, 2003.
¹⁴ *Amer. J. Clin. Nutr.* 80: 1237, 2004.
¹⁵ *New Eng. J. Med.* 342: 1156, 2000.
¹⁶ *New Eng. J. Med.* 342: 1149, 2000.

The Whole Truth

By Bonnie Liebman & Jayne Hurley

Good Source

"Good source of whole grain," says Kraft Supermac & Cheese, Wonder Made with Whole Grain White Bread, Pepperidge Farm Goldfish Made with Whole Grain, and Post Honey Bunches of Oats Cereal Bars.



What's a "good source"? At least 8 grams of whole grain per serving, according to the food industry. But a serving of many foods weighs 30 to 55 grams (one to two ounces), which means "good source" foods could be as much as 85 percent refined grain.

Foods that say "excellent source" can have as little as 16 grams of whole grain per serving.

(Don't confuse *whole grain* with *fiber*. Eight grams of whole wheat has less than 1 gram of fiber.)

In February, the Food and Drug Administration urged companies to stop making "good" or "excellent source" claims. But the FDA's policy is voluntary, so the claims may not disappear any time soon.

The Whole Truth: "Good source" or "excellent source" foods often have far more refined grain than whole grain.



Whole grains are hot. From breads and cereals to crackers, cookies, pasta, and pretzels, whole-grain claims are everywhere.

The food industry is clearly bent on marketing more 100 percent whole-grain foods, including croutons, frozen entrees, and pizza (see photos above).

But loose regulations are allowing companies to make up their own whole-grain claims. And that has left consumers to sort out the differences between promises like "made with whole grain," "whole grain blend," and "multigrain," with no numbers (like "50% whole grain") on the packages to guide them.

Here's the whole truth, and nothing but....

The information for this article was compiled by Tamara Goldis.

Harvest Wheat

Who wouldn't want what DiGiorno's label calls the "goodness of harvest wheat crust"? And the "9 grams of whole grain per serving" in its Harvest Wheat Rising Crust Pizza may sound impressive.

But that's 9 grams out of each 130-gram slice of pizza (a sixth of a DiGiorno pie). Most of the rest is water, refined flour, cheese, and tomato paste.

Nine grams of whole grain is better than no whole grain. But if you have to eat, say, 20 or 30 grams of white flour to get 9 grams of whole wheat, the label should make that clear.

Kraft sells not only DiGiorno, but single-serve South Beach Diet Harvest Wheat Crust Pizzas. On South Beach boxes, the words "Harvest Wheat" mean "whole wheat." Go figure.

The Whole Truth: "Wheat" could mean refined or whole. "Harvest" means "nice sounding word."



Made with (Not Much)

"Made with Whole Wheat," says the Kellogg's Eggo Nutri-Grain Pancakes box.

Who would suspect that Nutri-Grain pancakes are mostly refined flour? In fact, they've got more sugar than whole wheat.

Eggo Nutri-Grain Waffles play the same game.

The big print says "Made with Whole Wheat," but the waffles have more refined flour than whole wheat. And only 25 to 30 percent of the flour in Sara Lee Soft & Smooth made with Whole Grain White Bread is whole grain. Ditto for General Mills Rice Chex ("with Whole Grain").

The Whole Truth: "Made with" often means "made with very little."



Multigrain

Entenmann's Multi-Grain Cereal Bars are "loaded with real fruit filling in a fresh baked multi-grain crust," says the box.

Technically true, but the crust consists largely of bleached wheat (that is, refined) flour and more sugars, palm oil, and nonfat milk than (whole-grain) oats or wheat bran. (The "real fruit filling" has more corn syrup than raspberries.)

Multigrain claims are multiplying, as are claims that replace "multi" with a number (like 12-Grain). You'll find them on foods like:

- Nabisco Premium Saltines with Multi Grain, which have no more than 1½ grams of whole grains in a five-Saltine serving.
- Barilla Plus "Enriched Multigrain Pasta," which has more (refined) semolina flour than "grain and legume flour blend."
- Nabisco Harvest Five Grain Wheat Thins crackers and Multi-Grain Wheat Thins Chips, which are only about 10 percent whole grain. (Multi-Grain Wheat Thins *crackers* are half whole grain.)

The Whole Truth: It doesn't matter if you're getting 5, 10, or 15 grains if those grains are mostly refined.



Blends

A "whole grain blend" can be mostly whole grain, mostly refined grain, or half and half.

Ronzoni Healthy Harvest Whole Wheat Blend Pasta, for example, has no whole wheat flour. It's mostly refined flour with wheat bran and wheat fiber tossed in.

Rice A Roni Savory Whole Grains Roasted Garlic Italiano is "a blend of whole grain brown rice with orzo," while the Savory Whole Grains Chicken & Herb Classico is "a blend of whole grain brown rice, pearled barley and pearled wheat." But the company won't say how much refined grain (orzo, pearled barley, and pearled wheat) is in the box.

Near East Whole Grain Blends, on the other hand, tell shoppers—albeit in small print on the back—that the Roasted Pecan & Garlic, for example, "contains 53% Whole Grain as packaged." (The others range from 52 to 76 percent.)

Brilliant. Now if we could only get the government to require a percentage on all foods that make whole-grain claims, consumers would know what they're getting.

The Whole Truth: "Whole grain blend" often means a mix of whole and refined grains.



Whole Grain

Does "whole grain" on the package mean "100% whole grain" in the food? Sometimes.

Pepperidge Farm's delicious new Whole Grain Swirl breads are 100% whole grain, though their packages don't say so.

In contrast, Knorr Lipton Rice Sides Made with Whole Grains are 75% whole grain. And the "Whole Grain Fettuccini" in Knorr Lipton Pasta Sides Made with Whole Grains is 51% whole wheat. (We had to call the company to find out.)

Don't get us wrong. A pasta that's 51% whole wheat beats one that's 0% whole wheat. But it would be nice to see those percentages on the label.

The Whole Truth: If the label doesn't say "100% whole grain," check the ingredient list to see if the food contains any refined grains or flour. Dead giveaways: enriched or unbleached wheat flour, semolina flour, durum flour, and rice flour. (It's okay to ignore refined flours if they appear far down the list near the salt.)



Heart Disease & Cancer Claim

"Rich in Whole Grains...May Reduce The Risk of Heart Disease," says the label of Boboli 100% Whole Wheat Pizza Crust. The smaller print adds, "Diets rich in whole grain foods and other plant foods and low in total fat, saturated fat, and cholesterol may reduce the risk of heart disease and some cancers."

That mouthful is called a health claim because it mentions a disease. And it's only allowed on a food that is at least 51 percent whole grain; low in total fat, saturated fat, and cholesterol; and not high in sodium or low in nutrients.

The trouble is that few consumers know all that. And companies can slap a concise, upbeat "structure or function" claim (like "may promote heart health") on any old food instead.

The Whole Truth: Only *decent* foods can make whole-grain claims that mention heart disease or cancer. Any food can make structure or function claims like "may promote heart health."

