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# Nearly all Americans fail to eat enough of this actual superfood

While we obsess about carbs and protein, we've ignored fiber — at our peril.

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When we fret about the deterioration of the American diet, we tend to focus on the excessive amounts of sugar, salt, and calories we're now eating.

What we don't talk about: an important ingredient that's gone missing as we've been filling our plates with more chicken and cheese.

Fiber. Only 5 percent of people in the US meet the Institute of Medicine's recommended daily target of 25 grams for women and 38 grams for men. That amounts to a population-wide deficiency — what nutritionists call the "fiber gap."

"People are so busy avoiding carbs, they forget that these foods give [them] important dietary components," said nutritionist Julie Jones, of St. Catherine University.

Fiber is the closest thing we have to a true superfood — or super-nutrient since it's a part of so many different foods. Eating a fiber-rich diet is associated with better gastrointestinal health and a reduced risk of heart attacks, strokes, high cholesterol, obesity, type 2 diabetes, even some cancers. That's because fiber is amazingly helpful in many ways: It slows the absorption of glucose — which evens out our blood sugar levels — and also lowers cholesterol and inflammation.

These benefits grow the more fiber people eat. In a recent Lancet review of 185 studies and 58 clinical trials, researchers found that if 1,000 people transitioned from a low-fiber diet (under 15 grams per day) to a high-fiber diet (25 to 29 grams per day), they'd prevent 13 deaths and six cases of heart disease.

If fiber were a drug, we'd be all over it. But the average American gets just 16 grams per day — half of what we should be eating.

A big reason for that has to do with what we now eat. Instead of munching on fruits, vegetables, beans, nuts, and seeds, more than half of the calories Americans consume come from ultra-processed foods. On any given day, nearly 40 percent of Americans eat fast food. These prepared and processed meals tend to be low in fiber, or even fiber free. (A cup of cooked oatmeal has 4 grams of fiber and a pear has 6 grams, while a McDonald's hamburger has one gram and soda has none.)

This pattern of eating is not just leading to weight gain and obesity-related health issues; it's hurting our gastrointestinal health in ways researchers are only beginning to understand. That's because fiber's benefits are a lot more complicated than our prune-peddling moms and grandmothers appreciated.

Fiber doesn't just help us poop better — it also nourishes our gut microbiome. The science, while still pretty nascent, is fascinating and it points to the fact that the fiber gap may be even more damaging than we've realized.

There are many different types of fiber — and they do different things in our guts

To think of fiber as just Metamucil and bran cereal is to do its complexity a disservice.

Fiber (or “fibers,” as the researchers who study it say) is a group of different kinds of plant-based carbohydrates that affect our gastrointestinal tract in myriad ways. The big difference between fiber and other carbs, like starches and sugar, is that we can’t directly digest or absorb it. And some fiber types can only be broken down by the gut microbiome, the ecology of trillions of diverse bacteria lining our intestines and colon.

Scientists have learned over the years that fiber can be soluble (meaning it dissolves in water), viscose (gel-forming), or fermentable (bacteria can metabolize it) — and they’re just beginning to understand how these different fiber types interact with our gastrointestinal tract and affect our health.

Take cellulose, a type of fiber in fruits and vegetables: it’s insoluble and it’s not fermentable. Hemicellulose, found in bran, can’t be dissolved in water and it’s not gel-forming (viscous) but it is fermentable. Psyllium, in Metamucil, is water soluble, gel-forming and less fermentable than other fibers. There’s also another class, known as “functional fiber”: industrially processed but natural fibers (such as inulin or fructan) and synthetic fibers (such as polycarbophil), all of which can be added to foods and supplements.

Understanding this variety is relevant to our health because different fibers have different health effects on our gastrointestinal tract, said William Chey, a professor of gastroenterology and nutrition at the University of Michigan. Gel-forming fibers like psyllium, for example, hold on to water. So if your stool is hard, they can help soften it, Chey said. “If your stool is too loose, the water-absorbing capacity can add form.”

Fermentability is also important, he explained, because it reflects whether the gut microbiome views fiber as a food source or not. Fermentable fibers can exacerbate gas and bloating, so people who experience those symptoms might want to adjust their intake. Researchers have demonstrated that a low FODMAP diet — which limits fermentable foods, including fibers such as fructan — can alleviate irritable bowel syndrome.

“Most doctors and people think all fiber is created equal,” Chey added. “But different types of fiber have different properties in the gut, especially as it pertains to the microbiome.”

Most humans have evolved to eat lots of fiber

The second thing to know about fiber is that humans evolved to eat it — a lot of it. Long before we learned to cook, domesticate animals, and put McDonald’s on every corner, our evolutionary cousins — such as chimps and bonobos — followed frugivore diets, subsisting mainly on fiber-heavy fruits, roots, shoots, nuts, and seeds. There’s also ample evidence that early humans went to great lengths to eat fiber-rich carbohydrates, such as oats and acorns.

Today, studies of Tanzania’s Hadza people, one of the few remaining hunter-gatherer groups on the planet, are a useful model for understanding just how much fiber early humans probably ate. Tribe members consume 100 to 150 fiber grams per day — enough to fill some 50 bowls of Cheerios, and 10 times what Americans take in, as NPR reported. Their daily diet is rich in roughage — tubers, berries, baobab fruits — and the Hadza people don’t eat any ultra-processed foods.

Researchers who study the health effects of fiber, including Jens Walter at the University of Alberta, say the Hadza’s enthusiasm for roughage should remind us of how much the human diet has shifted away from fiber.

“It’s really just within the last 5,000 years, and definitely within the last 100 years, that we basically took all the fiber away,” he said. “The average amount of fiber consumed by now is a small fraction to what we evolved with.” (Caveat: There are human communities — like the Inuit in Greenland — who’ve adapted to survive on meat-heavy diets without many plants, but they’re outliers.)

This change isn’t just attributable to the advent of fiber-free processed and fast foods in advanced economies. More than 10,000 years ago, before agriculture and selective plant breeding, early fruits and vegetables were almost unrecognizable by today’s standards.

Generation after generation of farmers have since bred them to be bigger and tastier — in many cases increasing their sugar content and stripping them of fiber. Milling, meanwhile, cleared the whole-grain fractions out of our bread and bakery products, which were a major fiber source, Walter said. And meat replaced fibrous beans and lentils as the main source of protein in many parts of the world. Researchers are now documenting the health impacts of that change.

Why fiber is good for our gut

Because our intestines can’t directly digest fiber, we’ve long seen fiber as beneficial for relieving constipation by adding bulk to stool and promoting regular bowel movements.

Another commonly touted fiber benefit: It can help us feel full, so we eat less and maybe even lose weight. (There’s some debate about fiber’s effect on satiety and appetite. The most recent systematic reviews of the research suggest fiber’s impact here is surprisingly modest, though others note that many studies have focused on supplements instead of whole foods, which are probably more satiating.)

Still, all this “was before people [realized] how much the non-digestible things we eat impact our gut bacteria,” said University of Michigan microbiologist Eric Martens.

Researchers now consider fiber’s role in nourishing our gut microbiome — the ecosystem of microbes in our intestines — to be one of its main health benefits. They don’t yet fully understand why fiber is so good for our gut, but they have some ideas.

Fermentable fibers — which include all soluble fibers and some insoluble fibers — are metabolized or fermented by bacteria in the gastrointestinal tract. That process produces chemicals, including short-chain fatty acids, which are important food sources for our gut bacteria.

They also carry health benefits, Martens said. Short-chain fatty acids have been shown to promote insulin production, so we can better manage the spikes of sugar (or glucose) in our blood, for example, helping to manage type 2 diabetes. In addition, they seem to have anti-inflammatory properties.

“When we don’t consume enough fiber, we are essentially starving our gut microbiome,” said Alberta’s Jens Walter, “which is likely detrimental for a variety of reasons. We also probably lose [microbiome] diversity.”

Andrew Gewirtz of Georgia State University was among the researchers who noticed that mice develop metabolic syndrome — obesity and its associated disorders, such as diabetes and high cholesterol — when they are fed a high-fat diet. But when fiber was added to the high-fat diet, most of that metabolic syndrome went away.

“We realized the fiber is very important for our metabolic parameters,” Gewirtz told Vox. So he decided to compare the microbiomes of mice on a fiber-enriched high-fat diet with mice on a low-fiber high-fat diet, to figure out what they might reveal about why extra fiber seemed to offset the health harms of dietary fat. And he found the two sets of mice wound up having really different microbiomes: Rodents on the low-fiber diet had a marked reduction in the total numbers of bacteria in their gut and a less diverse microbiome compared to the mice on the high-fiber diet.

That lack of diversity might have negative health effects — one of them to do with the mucus layer in the gut. Mucus acts as a protective barrier between us and the outside world. It’s constantly being replenished by secretions from the cells that make up our intestines, and it’s covered with a layer of bacteria, part of our microbiome. Fiber feeds the bacteria on top of the mucus layer as it passes through, helping to keep our microbiomes robust, Gewirtz said.

Another fiber study — again in mice — showed what happens when the bacteria in the digestive tract don’t get any fiber. Researchers, including Martens, found the bacteria begin to eat away at the mucus layer, bringing them into closer contact with the intestinal tissue.

“The hypothesis is if we stop feeding the microbiome [fiber], the bacteria will resort more frequently to digesting that mucus barrier as a source of nutrients.”

If bacteria eating up the mucus layer sounds bad, well, it is. The mucus layer keeps pathogens out, and the researchers were able to show that if they introduced a pathogen in the context of a low-fiber diet, it had an easier time getting into the intestine and causing an infection. “The lack of a mucus barrier made the disease get much worse much quicker,” Martens added. “It may irritate the [intestinal] tissue or provoke immune responses,” leaving the mice more vulnerable to disease.

While it’s not yet clear how or whether these findings will translate to people, researchers know that altering the fiber in one’s diet creates changes in the human microbiome.

And for now, this science shows us that we should start thinking about fiber differently, Gewirtz said. The exclusive focus on fiber’s constipation-fighting properties misses the big picture: “It’s just one thing that fiber does” and maybe not as important as fiber’s impact on our microbiome.

**How to close the fiber gap: Eat more of these foods**

| Food | Standard portion size | Dietary fiber in standard portion (in grams) |
|---|---|---|
|  Navy Beans | 1/2 cup | 9.3 |
|  Pumpkin Seeds | 1 oz. | 5.2 |
|  Air popped popcorn | 3 cups | 3.5 |
|  Sweet Potatoes | 1 medium | 3.6 |
|  Pears | 1/4 cup | 5.5 |
|  Raspberries | 1/2 cup | 4.0 |
|  Green Peas | 1/2 cup | 5.2 |

Source: USDA

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Only five percent of Americans meet the recommended fiber target — and that means most miss out on fiber's benefits. So how can you eat more fiber? Every researcher I spoke to suggested aiming to get a diversity of fiber from a varied menu of whole foods, instead of relying only on supplements or fiber-enriched processed foods, especially the sugary bars and brownies now being marketed as fiber-delivery tools.

To do that, consider snacking on whole fruits, replacing white bread with whole-grain alternatives, eating potatoes with the skins on, and tossing berries, nuts, and seeds on your yogurt, cereals, or salads, Hannah Holscher, an assistant professor of nutrition at the University of Illinois, suggested. "Lots of small changes can add up."

If you like smoothies, throw your fruits, veggies, and nuts in a blender. Contrary to the hype about smoothies degrading fiber, some of the researchers I spoke to actually encouraged this approach. "Even baking does not destroy most fibers," Walter said.

"[The] natural sources are probably better for both your digestive health and your microbiome. They're more diverse from the chemical level," Martens added. "If you can get 25 to 30 grams per day from beans, nuts, vegetables and fruits, and whole grains — that's a good place to start."

**Andrew Reynolds**, a diabetes and obesity researcher at New Zealand's University of Otago (and the lead author on that recent ***Lancet*** **review** of fiber's benefits), laid out what meeting one's fiber target might look like in a meal plan. He tracked what he ate on a recent day.

**Morning**

Two slices chunky wholegrain toast with apricot jam: 5 grams fiber

Two cups of black coffee: 0 fiber

1 small apple: 2 grams fiber

**Lunch**

Red beans and brown rice with salsa verde and hot sauce: 7 grams fiber

Large handful of unsalted peanuts: 2 grams fiber

2 cups tea with low fat milk: 0 fiber

1 carrot, raw: 2 grams fiber

2 small prunes: 1.5 grams fiber

Two cups of black coffee: 0 fiber

**Evening**

1 wholemeal Turkish pide bread: 2.5 grams fiber

2 cups of kale and white bean salad with tahini dressing: 8 grams fiber

1/3 eggplant with yoghurt dressing and pomegranate: 2 grams fiber

1 cob of corn: 2 grams fiber

2 lamb meatballs in 1 cup fennel/tomato sauce: 4 grams fiber

1 glass white wine: 0 fiber

Reynolds consumed 38 grams of fiber, the recommended target for adult men. But he also advised that people shouldn't obsess about meeting fiber targets. "Any increase in fiber is good for you, especially for those on a low-fiber diet."

For many Americans, upping the fiber intake may be easier said than done. The reasons people aren't eating fiber look a like like the reasons they're not following a healthy diet generally. "[It's] a perceived lack of time to prepare meals at home, eating out more, [a lack of] knowledge about how to prepare different high-fiber foods ... in a way that tastes good," Holscher explained.

Some high-fiber foods — like fresh produce and nuts — also **cost more than lower-fiber alternatives**, such as sweets or soda. And even though grains, beans and lentils come cheap, they're not always convenient to prepare. So maybe the solution to the fiber gap is **making fiber cool**, and as cheap and easy to eat as hamburger.