The Most Important Nutrient Americans Are Deficient In

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Most people have heard about the substances we are eating in excess, such as added sugar, salt, saturated fat, and dietary cholesterol. But not as many are aware of the nutrients we need desperately to consume more of. Each version of the Dietary Guidelines for Americans describes “nutrients of concern.” These are the nutrients we are under-consuming to such an amount it is causing serious health problems. One of these nutrients has been at the top of the list for decades – fiber. On average, Americans are consuming about half the amount recommended by the National Academy of Sciences. Fiber may be the single most important nutrient most Americans are deficient in.

The benefits of fiber rich foods are hard to exaggerate. The biggest killers in the U.S. are heart disease and cancer. Fiber improves cholesterol, reduces blood pressure, reduces the risk of several cancers, and reduces the risk of heart disease.[1] For every 7 grams of dietary fiber (the intrinsic fiber naturally present in food), the risk of a cardiovascular event decreases by 9%.[2] For every 10 grams of dietary fiber, the risk of colorectal cancer decreases by about 7%.[3] Fiber lowers blood sugar and reduces the risk of type 2 diabetes.[4] Fiber prevents hemorrhoids, lowers your risk of digestive disorders like diarrhea and constipation, reduces your risk of diverticular disease, helps you lose weight by feeling full, and reduces inflammation.[5] Fiber is also associated with improved learning and memory, as well as longer telomeres and decreased biological aging.[6]

The FDA allows several health claims related to fiber, such as:[7]

- “Low fat diets rich in fiber-containing grain products, fruits, and vegetables may reduce the risk of some types of cancer, a disease associated with many factors”, and
- “Diets low in saturated fat and cholesterol and rich in fruits, vegetables, and grain products that contain some types of dietary fiber, particularly soluble fiber, may reduce the risk of heart disease, a disease associated with many factors”.

Fiber comes from plant cell walls. There are six types of fiber: cellulose, hemicellulose, pectin, gum, mucilage, and lignin.[8] Each type of fiber has a different effect on the body. Fibers can be categorized according to their viscosity, fermentability, or most commonly, their solubility.

Solubility

All plant-based foods have a mixture of soluble and insoluble fiber.[9] Pectin, gums, mucilages and some hemicelluloses are soluble fibers which dissolve in water and are broken down into a gel-like substance. Soluble fiber softens your stool and gives your body more time to extract nutrients from your food. Soluble fibers, such as psyllium (a mucilage made from psyllium seed husks) and beta

glucans (a hemicellulose) found in oats and barley, can lower LDL cholesterol.[10]The research is so strong the FDA allows the following health claim on food packaging: “Soluble fiber from foods such as [oat bran, rolled oats, whole oat flour, oatrim, whole grain barley, dry milled barley, barley betafiber, or psyllium husk], as part of a diet low in saturated fat and cholesterol, may reduce the risk of heart disease.”[11]

Cellulose, lignins, and many hemicelluloses are insoluble fibers that do not dissolve in water and are not easily digested by intestinal bacteria. Insoluble fibers increase stool bulk, push bile out of your system, and promote the movement of food through your digestive tract. Insoluble fiber moves through the intestines undissolved and is therefore often referred to as “roughage.”

Viscosity and Appetite

Viscosity is a measure of how resistant something is to flowing or changing shape (how thick it is). For example, peanut butter is more viscous than milk. In general, solid and semi-solid viscous foods decrease our appetite and food intake more than liquids.[12] As insoluble fibers do not dissolve in water, they don’t form the thick, sticky, viscous gels that most soluble fibers do. Soluble fibers are all viscous, but to different degrees. Certain viscous fibers make us feel more full than others, such as beta glucans in oats and barley, and psyllium.

A 2001 review found that for every 14 grams of fiber, there was a 10% decrease in calories consumed.[13] According to the World Cancer Research Fund (WCRF), there is “strong” evidence foods containing fiber (fruits, vegetables, legumes, whole grains, nuts, and seeds) decrease the risk of gaining weight or becoming overweight.[14] This is partly due to the decreased energy density of plant foods (they have less calories per weight than other foods). There are several possible mechanisms by which fiber itself can reduce calorie intake: a slowed rate of digestion, delayed absorption of nutrients allowing time for gut hormones such as peptide YY (PYY) and glucagon-like peptide (GLP-1) to be released, and fermentation into short-chain fatty acids. In other words, fiber may make you feel full by increasing how much you need to chew, slowing the time it takes for your stomach to empty, expanding your stomach which triggers stretch receptors, and by the release of certain gut hunger hormones and short-chain fatty acids. You also absorb less calories from fiber than other macronutrients – zero calories for insoluble fiber.

Fermentability

What makes fiber unique is that our bodies lack the digestive enzymes to absorb or digest fiber in the small intestine. Food travels from our mouth to the stomach, then to the small intestine. Digestive enzymes break food into smaller and smaller particles in the stomach and then the small intestine. Eventually the nutrients from the food you ate are absorbed into your blood stream through the walls of your small intestine. Waste products of digestion then pass to the large intestine (the colon) and out of the body through the rectum.

All fiber passes through the stomach and small intestine undigested. Insoluble fiber also passes through the large intestine and out of our body undigested. However, fermentable fibers can be broken down by our healthy gut bacteria. These healthy bacteria are often referred to as our “microbiome” or “microbiota”. We have thousands of different strains of bacteria in our gut. We call it a probiotic when a certain strain of live healthy bacteria (in a food or supplement) confers a health benefit in an adequate amount.[15] These healthy bacteria metabolize fermentable fiber into gases and short-chain fatty acids which are used by our colon as fuel.[16] We do not absorb any calories from nonfermented fiber but we may absorb up 2.5 calories per gram from fermented fiber.[17] About 70% of fiber is fermentable.[18]

Fermentable fibers include beta-glucans, gums, some hemicelluloses, and some resistant starches (described below). Each different type of fermented fiber produces a different mix of short-chain fatty acids. These fatty acids improve the health of the cells of the outer layer of your colon, increase the absorption of some minerals, inhibit the growth of unhealthy bacteria, help you feel full, and may decrease inflammation.[19] Fermentable fibers are also known as prebiotics, as they are the fuel for probiotics. Fermentable prebiotic fibers are found in onions, garlic, artichokes, chicory, leek, bananas, asparagus, lentils, chickpeas, barley, rye, oats, and wheat.

Before writing this article, I thought the key to a healthy gut was eating probiotics like those in yogurt. I was wrong. The key to a healthy gut is eating a wide variety of plants so our healthy gut bacteria are fed by the many forms of fermentable fiber in those plant foods. Eating premade bacteria (probiotics) can help with certain conditions, but is generally not as helpful as giving your body the ability to create its own healthy bacteria.[20] Probiotics can be helpful in the right circumstances, but it is important to find the exact probiotic strain that has been shown in randomized controlled trials to be helpful to your condition.[21] Probiotics are not something healthy individuals generally need.

According to Rob Knight, the creator of the American Gut Project in 2012, the single greatest predictor of a healthy gut microbiome is the diversity of plants you eat – eating at least thirty different plants in a week.[22]

Resistant Starch and the Second Meal Effect

Beans, peas, and lentils are known as legumes. Legumes are sometimes classified as vegetables when organizations give health recommendations, but legumes deserve to be recognized independently due to their many unique health benefits. Some research even links legume intake with the lowest risk of mortality when compared with the other food groups.[23]

Legumes are one of the best sources of a special type of starch.[24] Until the 1980s we thought all starch was rapidly digested into blood sugar in the small intestine. But some starch is resistant to digestion and passes into the large intestine to be used as food for our microbiome, just like fermentable fiber. They named this previously unknown form of starch “resistant starch”. Substantial research has since confirmed resistant starch functions much like dietary fiber. It reduces the amount of glucose released into the blood, lowering the demand for insulin while also reducing the caloric density of food. Foods with significant amounts of resistant starch make you feel full and have a low glycemic load. They produce a smaller rise in blood sugar than high starch foods with little resistant starch, such as potatoes, rice, and white bread.[25]

Another important aspect of eating resistant starch is that it reduces your blood sugar and appetite at the next meal you eat. Researchers refer to this as the “second meal effect”.[26] It can significantly reduce the amount of calories you consume without feeling hungry.[27] The resistant starch in whole grains can also cause the second meal effect.[28]

Should you worry about gas? It is true the fermentation of fiber and resistant starch produces gas, but that is a small price to pay for all of the health benefits. Gas is reduced over time as your microbiome adjusts to the fiber and resistant starch. The key is to start slow and gradually increase your intake. The amount of gas produced from eating beans and other legumes is greatly exaggerated.[29] Many people don’t experience any noticeable increased gas from eating legumes or other high fiber foods.[30]

Fiber Recommendations

The WCRF recommends 30 grams of fiber per day to reduce the risk of cancer. The National Academy Sciences and Dietary Guidelines for Americans recommend 14 grams per 1,000 calories to reduce the risk of heart disease. Less than 3% of men and 10% of women consume 14 grams per 1,000 calories.[31] According to the American Diabetes Association 2019 consensus report you don't see a reduction in blood sugar until you consume at least 50 grams of fiber per day.[32] Similarly, the latest Diabetes Canada Clinical Practice Guidelines found that diets providing 20 grams of fiber per 1,000 calories, from a mixed source of plant foods with a third or more from viscous soluble fiber, have important advantages for controlling blood sugar and LDL cholesterol.[33]

If you consume 2,000 calories per day and are not getting at least 40 grams of fiber, then you are not eating enough whole plant foods. A healthy diet should contain more than 40 grams of fiber per day. The cholesterol-lowering Portfolio Diet I described in my previous article, *Isothiocyanates, Isoflavones, and Phytosterols: Cruciferous Vegetables and Soy Foods*, contained about 78 grams of dietary fiber per day for 2,000 calories. In another study by the same research group, participants averaged more than 100 grams of fiber per day on a vegetable, fruit, and nut diet.[34] There is no upper limit established for fiber intake.[35] As the fiber in plant foods makes you feel full, it is unlikely you will consume too much.

Summary

The key to taking advantage of all fiber has to offer is eating a wide variety of whole grains, vegetables, legumes, fruit, nuts, and seeds. If you eat the foods I recommended in my article, *7 Foods Guaranteed to Make Huge Improvements to your Health and Well-Being*, you will be optimizing your fiber intake. You can also optimize your gut health by eating at least 30 different plants a week. A fiber supplement will not produce the same benefits as eating plant foods with fiber, as plants come packaged with thousands of other healthy nutrients.

About the Author: Keith Herman is an estate planning attorney who is also passionate about nutrition and helping others live their healthiest lives. Keith has certifications in nutrition and personal training.

#HealthyEating

#HealthyLifestyle

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